

Introduction to Psychology

INTRODUCTION TO PSYCHOLOGY

ARLENE LACOMBE; KATHRYN DUMPER; MARILYN LOVETT; MARION PERLMUTTER; ROSE M. SPIELMAN; AND WILLIAM JENKINS

ASHLEY OJO; BHREA' VAVASSEUR; BURT ASHWORTH; MANYU LI;
AND SONIA COOPER

LOUIS: The Louisiana Library Network



Introduction to Psychology Copyright © 2022 by LOUIS: The Louisiana Library Network is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/), except where otherwise noted.

©2022

CONTENTS

Preface	xi
Introduction	1
Adaptation Statement	2

Part I. Introduction to Psychology

1. What Is Psychology?	7
2. History of Psychology	12
3. Contemporary Psychology	29
4. References	46

Part II. The Science of Psychology

5. Scientific Thinking	53
6. Research Methods	59
7. Ethics	71
8. References	79

Part III. Physiological Aspects of Psychology

9. Human Genetics	85
10. Cells of the Nervous System	97
11. Parts of the Nervous System	108
12. Our Brains Control Our Thoughts, Feelings, and Behavior	114

13. The Endocrine System	129
14. References	135

Part IV. States of Consciousness

15. What Is Consciousness?	139
16. Why We Sleep	149
17. Stages of Sleep	156
18. Sleep Problems and Disorders	165
19. Substance Use and Abuse	174
20. Other States of Consciousness	188
21. References	195

Part V. Sensation and Perception

22. Sensation versus Perception	207
23. Vision	215
24. Hearing	227
25. Tasting, Smelling, and Touching	235
26. References	242

Part VI. Growth and Development

27. What is Growth and Development?	249
28. Lifespan Theories	258
29. Stages of Human Development	272
30. Death and Dying	304
31. References	310

Part VII. Learning

32. What Is Learning?	321
33. Classical Conditioning	326
34. Operant Conditioning	336
35. Observational Learning (Modeling)	350
36. Using the Principles of Learning to Understand Everyday Behavior	358
37. References	367

Part VIII. Thinking and Intelligence

38. Defining and Measuring Intelligence	373
39. Language	383
40. Cognition and Emotion	391
41. The Source of Intelligence	399
42. References	406

Part IX. Memory

43. How Memory Functions	413
44. Parts of the Brain Involved with Memory	429
45. Problems with Memory	437
46. Ways to Enhance Memory	454
47. References	461

Part X. Emotion and Motivation

48. Motivation	467
49. Hunger and Eating	480

50. Sexual Behavior	490
51. Emotion	501
52. References	515

Part XI. Personality

53. What Is Personality?	525
54. Origins of Personality	532
55. Personality and Behavior	549
56. Approaches and Measurements	559
57. References	569

Part XII. Social Psychology

58. What Is Social Psychology?	579
59. Social Cognition	590
60. Attitudes and Persuasion	598
61. Conformity, Compliance, and Obedience	611
62. Prejudice and Discrimination	623
63. Aggression	634
64. Prosocial Behavior	641
65. Social Cognition: Making Sense of Ourselves and Others	651
66. Interacting With Others: Helping, Hurting, and Conforming	669
67. Working With Others: The Costs and Benefits of Social Groups	686
68. References	698

Part XIII. Psychological Disorders

69. What Are Psychological Disorders?	709
70. Diagnosing and Classifying Psychological Disorders	717
71. Perspectives on Psychological Disorders	723
72. Anxiety Disorders	730
73. Obsessive-Compulsive and Related Disorders	741
74. Posttraumatic Stress Disorder	748
75. Mood Disorders	754
76. Schizophrenia	771
77. Dissociative Disorders	779
78. Personality Disorders	784
79. Disorders in Childhood	794
80. References	806

Part XIV. Treatment of Psychological Disorders

81. Reducing Disorder by Confronting It: Psychotherapy	829
82. Reducing Disorder Biologically: Drug and Brain Therapy	844
83. Reducing Disorder by Changing the Social Situation	853
84. Substance-Related and Addictive Disorders: A Special Case	859
85. Evaluating Treatment and Prevention: What Works?	865
86. References	873
Appendix A: Checklist for Accessibility	879
Glossary	882

The Creation of This Book

This textbook was created as part of the Interactive OER for Dual Enrollment project, facilitated by [LOUIS: The Louisiana Library Network](#) and funded by a \$2 million [Open Textbooks Pilot Program grant from the Department of Education](#).

This project supports the extension of access to high-quality post-secondary opportunities to high school students across Louisiana and beyond by creating materials that can be adopted for dual enrollment environments. Dual enrollment is the opportunity for a student to be enrolled in high school and college at the same time.

The cohort-developed OER course materials are released under a license that permits their free use, reuse, modification and sharing with others. This includes a corresponding course available in [MoodleNet](#) and [Canvas Commons](#) that can be imported to other Learning Management System platforms. For access/questions, contact [Affordable Learning Louisiana](#).

If you are adopting this textbook, we would be glad to know of your use via this [brief survey](#).

Review Statement

This textbook and its accompanying course materials went through at least two review processes:

- Peer reviewers, coordinated by Jared Eusea, River Parish Community College, used an online course development standard rubric for assessing the quality and content of each course to ensure that the courses developed through Interactive OER for Dual Enrollment support online learners in that environment. The evaluation framework reflects a commitment to accessibility and usability for all learners.
 - Reviewers
 - Jared Eusea
 - Nicole Shaw
 - Danielle Williams
- The Institute for the Study of Knowledge Management in Education (ISKME) collaborated with LOUIS to review course materials and ensure their appropriateness for dual enrollment audiences. Review criteria were drawn from factors that apply across dual enrollment courses and subject areas, such as determining appropriate reading levels, assessing the fit of topics and examples for high school DE students; applying high-level principles for quality curriculum design, including designing for

accessibility, appropriate student knowledge checks, and effective scaffolding of student tasks and prior knowledge requirements, addressing adaptability and open educational practices, and principles related to inclusion and representational social justice.

- Reviewers
 - Thadius Batiste
 - Tremika Cleary

INTRODUCTION

Is Psychology a science? What do our dreams really mean? What causes and treats mental illness? What factors are involved in human behavior? This text aims to answer these questions along with many others. A comprehensive review of the behavior of humans as well as other animals will be provided through each chapter. Topics such as learning, memory, emotions, behavioral disorders, and personality will be explored. The purpose of this text is to provide you with general information in Psychology, which will contribute to your overall body of knowledge.

Upon successful completion of this course, the student will be able to:

- Describe ethical principles that guide psychologists in research and therapy.
- Describe Psychology as a science and identify research methods in Psychology.
- Summarize historical and contemporary theoretical perspectives in Psychology.
- Identify factors in physiological and psychological processes involved in human behavior.
- Describe relations among individuals, groups, and society utilizing discipline-specific terminology.

ADAPTATION STATEMENT

Introduction to Psychology was created by Burt Ashworth, Sonia Cooper, Manyu Li, Ashley Ojo, Bhrea' Vavasseur, and Michael Waller through the Interactive OER for Dual Enrollment Introduction to Psychology Cohort, from LOUIS: The Louisiana Library Network and the Louisiana Board of Regents, funded through an Open Textbooks Pilot grant from the Fund for the Improvement of Postsecondary Education, U.S. Department of Education, 2021–2022. Most content was adapted and remixed from other open textbooks, as indicated below. Unless stated otherwise, *Introduction to Psychology* (c) 2022 is licensed under a [Creative Commons-Attribution-NonCommercial-ShareAlike 4.0 International license](#).

In *Introduction to Psychology*, gender-neutral language (they/their) has been used intentionally. In addition, while general ideas and content may remain unchanged from the sources from which this adapted version is based, word choice, phrasing, and organization of content within each chapter may have changed.

Licenses, attributions, and adaptations for each chapter are as follows:

Introduction to Psychology

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5ppsychology/>. CC BY 4.0.

The Science of Psychology

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5ppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

Adaptations:

- Chapter title changed to “The Science of Psychology”
- Chapter sections reorganized.
- Added chapter learning objectives
- Edited sections’ learning objectives.
- Added a new paragraph on the scientific method and a figure to demonstrate the scientific process.

Physiological Aspects of Psychology

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

States of Consciousness

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

Sensation and Perception

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

Growth and Development

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

Learning

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

Thinking and Intelligence

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

Memory

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

Emotions and Motivations

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

Personality

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

Social Psychology

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

Psychological Disorders

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

Treatment of Psychological Disorders

Adapted from:

Spielman, R., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M. (2021). *Psychology – H5P Edition*. BCcampus. <https://opentextbc.ca/h5pppsychology/>. CC BY 4.0.

University of Minnesota Libraries Publishing. (2015). *Introduction to Psychology*. University of Minnesota. <https://open.lib.umn.edu/intropsyc/>. CC BY-NC-SA 4.0.

PART I

INTRODUCTION TO PSYCHOLOGY



(credit “background”: modification of work by Nattachai Noogure; credit “top left”: modification of work by U.S. Navy; credit “top middle-left”: modification of work by Peter Shanks; credit “top middle-right”: modification of work by “devinf”/Flickr; credit “top right”: modification of work by Alejandra Quintero Sinisterra; credit “bottom left”: modification of work by Gabriel Rocha; credit “bottom middle-left”: modification of work by Caleb Roenigk; credit “bottom middle-right”: modification of work by Staffan Scherz; credit “bottom right”: modification of work by Czech Provincial Reconstruction Team)

Clive Wearing is an accomplished musician who lost his ability to form new memories when he became sick at the age of 46. While he can remember how to play the piano perfectly, he cannot remember what he ate for breakfast just an hour ago (Sacks, 2007). James Wannerton experiences a taste sensation that is associated with the sound of words. His former girlfriend’s name tastes like rhubarb (Mundasad, 2013). John Nash is a brilliant mathematician and Nobel Prize winner. However, while he was a professor at MIT, he would tell people that the *New York Times* contained coded messages from extraterrestrial beings that were intended for him. He also began to hear voices and became suspicious of the people around him. Soon thereafter, Nash was diagnosed with schizophrenia and admitted to a state-run mental institution (O’Connor & Robertson, 2002). Nash was the subject of the 2001 movie *A Beautiful Mind*. Why did these people have these experiences? How does the human brain work? And what is the connection between the brain’s internal processes and people’s external behaviors? This textbook will introduce you to various ways that the field of psychology has explored these questions.

1.

WHAT IS PSYCHOLOGY?

Learning Objectives

By the end of this section, you will be able to:

- Understand the etymology of the word “psychology”
- Define psychology
- Understand the merits of an education in psychology

Psychology is defined as *the scientific study of mind and behavior*. In Greek mythology, Psyche was a mortal woman whose beauty was so great that it rivaled that of the goddess Aphrodite. Aphrodite became so jealous of Psyche that she sent her son, Eros, to make Psyche fall in love with the ugliest man in the world. However, Eros accidentally pricked himself with the tip of his arrow and fell madly in love with Psyche himself. He took Psyche to his palace and showered her with gifts, yet she could never see his face. While visiting Psyche, her sisters roused suspicion in Psyche about her mysterious lover, and eventually, Psyche betrayed Eros’ wishes to remain unseen to her. Because of this betrayal, Eros abandoned Psyche. When Psyche appealed to Aphrodite to reunite her with Eros, Aphrodite gave her a series of impossible tasks to complete. Psyche managed to complete all of these trials; ultimately, her perseverance paid off as she was reunited with Eros and was ultimately transformed into a goddess herself (Ashliman, 2001; Greek Myths & Greek Mythology, 2014).



Antonio Canova's sculpture depicts Eros and Psyche.

Psyche comes to represent the human soul's triumph over the misfortunes of life in the pursuit of true happiness (Bulfinch, 1855); in fact, the Greek word **psyche** means *soul*, and it is often represented as a butterfly. The word **psychology** was coined at a time when the concepts of soul and mind were not as clearly distinguished (Green, 2001). The root **-ology** denotes *the scientific study of*, so the term *psychology* refers to the scientific study of the mind. Since science studies only observable phenomena and the mind is not directly observable, we expand this definition to the scientific study of mind and behavior.

The scientific study of any aspect of the world uses the scientific method to acquire knowledge. To apply the scientific method, a researcher with a question about how or why something happens will propose a tentative explanation, called a hypothesis, to explain the phenomenon. A hypothesis is not just any explanation; it should fit into the context of a scientific theory. A **scientific theory** is *a broad explanation or group of explanations for some aspect of the natural world that is consistently supported by evidence over time*. A theory is the best understanding that we have of that part of the natural world. Armed with the hypothesis, the researcher then makes observations or, better still, carries out an experiment to test the validity of the hypothesis. That test and its results are then published so that others can check the results or build on them. It is necessary that any explanation in science be testable, which means that the phenomenon must be perceivable and measurable. For example, “a bird sings because it is happy” is not a testable hypothesis, since we have no way to measure the happiness of a bird. We must ask a different question, perhaps about the brain state of the bird, since this can be measured. In general, science deals only with matter and energy—that is, those things that can be measured—and it cannot arrive at knowledge about values and morality. This is one reason why our scientific understanding of the mind is so limited, since thoughts, at least as we experience them, are neither matter nor energy. The scientific method is also a form of empiricism. An **empirical method** for *acquiring knowledge*

is one based on observation, including experimentation, rather than a method based only on forms of logical argument or previous authorities.

It was not until the late 1800s that psychology became accepted as its own academic discipline. Before this time, the workings of the mind were considered under the auspices of philosophy. Given that any behavior is, at its roots, biological, some areas of psychology take on aspects of a natural science like biology. No biological organism exists in isolation, and our behavior is influenced by our interactions with others. Therefore, psychology is also a social science.

Merits of an Education in Psychology

Often, students take their first psychology course because they are interested in helping others and want to learn more about themselves and why they act the way they do. Sometimes, students take a psychology course because it either satisfies a general education requirement or is required for a program of study such as nursing or pre-med. Many of these students develop such an interest in the area that they go on to declare psychology as their major. As a result, psychology is one of the most popular majors on college campuses across the United States (Johnson & Lubin, 2011). Several well-known individuals were psychology majors. Just a few famous names on this list are Facebook’s creator Mark Zuckerberg, television personality and political satirist Jon Stewart, actress Natalie Portman, and filmmaker Wes Craven (Halonen, 2011). About 6 percent of all bachelor’s degrees granted in the United States are in the discipline of psychology (U.S. Department of Education, 2013).

An education in psychology is valuable for a number of reasons. Psychology students hone critical thinking skills and are trained in the use of the scientific method. Critical thinking is the active application of a set of skills to information for the understanding and evaluation of that information. The evaluation of information—assessing its reliability and usefulness—is an important skill in a world full of competing “facts,” many of which are designed to be misleading. For example, critical thinking involves maintaining an attitude of skepticism, recognizing internal biases, making use of logical thinking, asking appropriate questions, and making observations. Psychology students also can develop better communication skills during the course of their undergraduate coursework (American Psychological Association, 2011). Together, these factors increase students’ scientific literacy and prepare students to critically evaluate the various sources of information they encounter.

In addition to these broad-based skills, psychology students come to understand the complex factors that shape one’s behavior. They appreciate the interaction of our biology, our environment, and our experiences in determining who we are and how we will behave. They learn about basic principles that guide how we think and behave, and they come to recognize the tremendous diversity that exists across individuals and across cultural boundaries (American Psychological Association, 2011).

Watch a brief video that describes some of the questions a student should consider before deciding to major in psychology: [Why Major in Psychology?](#)



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=136#oembed-1>

Summary

“Psychology” derives from the roots *psyche* (meaning soul) and *-ology* (meaning scientific study of). Thus, “psychology” is defined as the scientific study of mind and behavior. Students of psychology develop critical thinking skills, become familiar with the scientific method, and recognize the complexity of behavior.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=136#h5p-26>

Critical Thinking Questions

Why do you think psychology courses like this one are often requirements of so many different programs of study?

Psychology courses deal with a number of issues that are helpful in a variety of settings. The text made mention of the types of skills as well as the knowledge base with which students of psychology become familiar. As mentioned in the link to learning, psychology is often helpful/valued in fields in which interacting with others is a major part of the job.

Why do you think many people might be skeptical about psychology being a science? One goal of psychology is the study of the mind. Science cannot directly study the mind, because it is not a form of matter or energy. This might create some skepticism about the scientific nature of psychology.

Personal Application Question

Why are you taking this course? What do you hope to learn about during this course?

Media Attributions

- “[iDeclare – Why Major in Psychology?](#)” by [humbiomovies](#). [CC BY 3.0 License](#).

2.

HISTORY OF PSYCHOLOGY

Learning Objectives

By the end of this section, you will be able to:

- Understand the importance of Wundt and James in the development of psychology
- Appreciate Freud's influence on psychology
- Understand the basic tenets of Gestalt psychology
- Appreciate the important role that behaviorism played in psychology's history
- Understand basic tenets of humanism
- Understand how the cognitive revolution shifted psychology's focus back to the mind

Psychology is a relatively young science with its experimental roots in the 19th century, compared, for example, to human physiology, which dates much earlier. As mentioned, anyone interested in exploring issues related to the mind generally did so in a philosophical context prior to the 19th century. Two men, who worked in the 19th century, are generally credited as being the founders of psychology as a science and academic discipline that's distinct from philosophy. Their names were Wilhelm Wundt and William James. This section will provide an overview of the shifts in paradigms that have influenced psychology from Wundt and James through today.

Wundt and Structuralism

Wilhelm Wundt (1832–1920) was a German scientist who was the first person to be referred to as a psychologist. His famous book entitled *Principles of Physiological Psychology* was published in 1873. Wundt viewed psychology as a scientific study of conscious experience, and he believed that the goal of psychology was to identify components of consciousness and how those components combined to result in our conscious

experience. Wundt used introspection (he called it “internal perception”), *a process by which someone examines their own conscious experience as objectively as possible*, making the human mind like any other aspect of nature that a scientist observed. Wundt’s version of introspection used only very specific experimental conditions in which an external stimulus was designed to produce a scientifically observable experience of the mind (Danziger, 1980). The first stringent requirement was the use of “trained” or practiced observers, who could immediately observe and report a reaction. The second requirement was the use of repeatable stimuli that always produced the same experience in the subject and allowed the subject to expect and thus be fully attentive to the inner reaction. These experimental requirements were put in place to eliminate “interpretation” in the reporting of internal experiences and to counter the argument that there is no way to know that an individual is observing their mind or consciousness accurately since it cannot be seen by any other person. *This attempt to understand the structure or characteristics of the mind was known as structuralism*. Wundt established his psychology laboratory at the University at Leipzig in 1879. In this laboratory, Wundt and his students conducted experiments on, for example, reaction times. A subject, sometimes in a room isolated from the scientist, would receive a stimulus such as light, image, or sound. The subject’s reaction to the stimulus would be to push a button, and an apparatus would record the time to reaction. Wundt could measure reaction time to one-thousandth of a second (Nicolas & Ferrand, 1999).



(a)



(b)

(a) Wilhelm Wundt is credited as one of the founders of psychology. He created the first laboratory for psychological research. (b) This photo shows him seated and surrounded by fellow researchers and equipment in his laboratory in Germany.

However, despite his efforts to train individuals in the process of introspection, this process remained highly subjective, and there was very little agreement between individuals. As a result, structuralism fell out of favor with the passing of Wundt’s student, Edward Titchener, in 1927 (Gordon, 1995).

James and Functionalism

William James (1842–1910) was the first American psychologist who espoused a different perspective on how psychology should operate. James was introduced to Darwin's theory of evolution by natural selection and accepted it as an explanation of an organism's characteristics. Key to that theory is the idea that natural selection leads to organisms that are adapted to their environment, including their behavior. Adaptation means that a trait of an organism has a function for the survival and reproduction of the individual, because it has been naturally selected. As James saw it, psychology's purpose was to study the function of behavior in the world, and as such, his perspective was known as functionalism. **Functionalism** *focuses on how mental activities help an organism fit into its environment*. Functionalism has a second, more subtle meaning in that functionalists were more interested in the operation of the whole mind rather than of its individual parts, which were the focus of structuralism. Like Wundt, James believed that introspection could serve as one means by which someone might study mental activities, but James also relied on more objective measures, including the use of various recording devices, and examinations of concrete products of mental activities and of anatomy and physiology (Gordon, 1995).

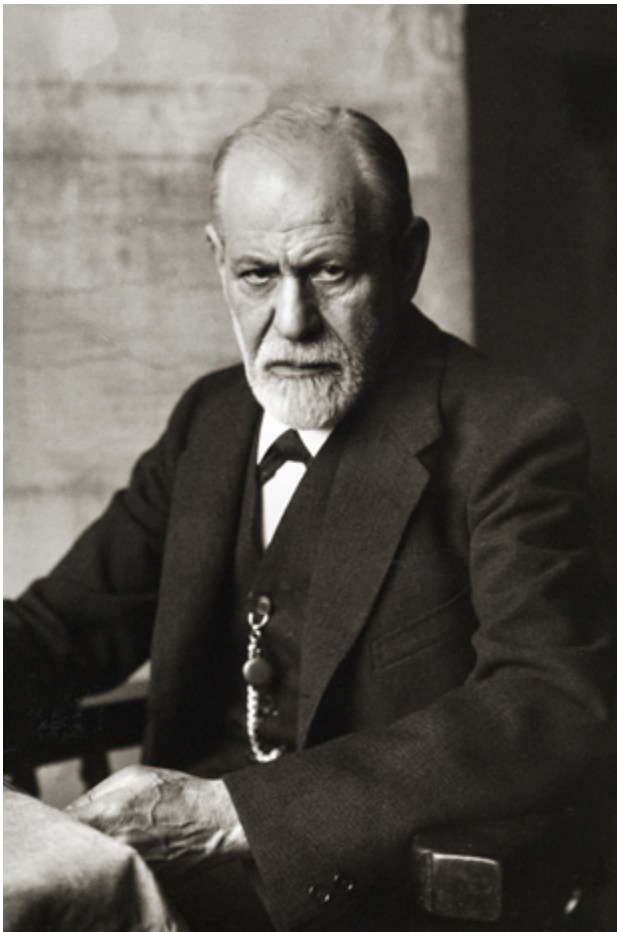


William James, shown here in a self-portrait, was the first American psychologist.

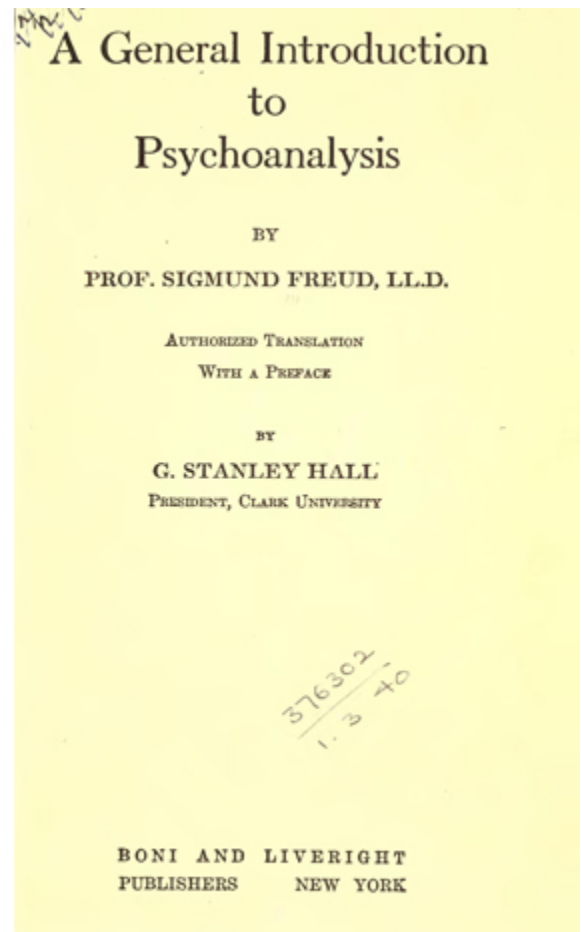
Freud and Psychoanalytic Theory

Perhaps one of the most influential and well-known figures in psychology's history was Sigmund Freud.

Freud (1856–1939) was an Austrian neurologist who was fascinated by patients suffering from “hysteria” and neurosis. Hysteria was an ancient diagnosis for disorders, primarily of women with a wide variety of symptoms, including physical symptoms and emotional disturbances, none of which had an apparent physical cause. Freud theorized that many of his patients’ problems arose from the unconscious mind. In Freud’s view, the unconscious mind was a repository of feelings and urges of which we have no awareness. Gaining access to the unconscious, then, was crucial to the successful resolution of the patient’s problems. According to Freud, the unconscious mind could be accessed through dream analysis, by examinations of the first words that came to people’s minds, and through seemingly innocent slips of the tongue. **Psychoanalytic theory** *focuses on the role of a person’s unconscious, as well as early childhood experiences*, and this particular perspective dominated clinical psychology for several decades (Thorne & Henley, 2005).



(a)



(b)

(a) Sigmund Freud was a highly influential figure in the history of psychology. (b) One of his many books, *A General Introduction to Psychoanalysis*, shared his ideas about psychoanalytical therapy; it was published in 1922.

Freud’s ideas were influential, and you will learn more about them when you study lifespan development, personality, and therapy. For instance, many therapists believe strongly in the unconscious and the impact of

early childhood experiences on the rest of a person's life. The method of psychoanalysis, which involves the patient talking about their experiences and selves, while not invented by Freud, was certainly popularized by him and is still used today. Many of Freud's other ideas, however, are controversial. Drew Westen (1998) argues that many of the criticisms of Freud's ideas are misplaced, in that they attack his older ideas without taking into account later writings. Westen also argues that critics fail to consider the success of the broad ideas that Freud introduced or developed, such as the importance of childhood experiences in adult motivations, the role of unconscious versus conscious motivations in driving our behavior, the fact that motivations can cause conflicts that affect behavior, the effects of mental representations of ourselves and others in guiding our interactions, and the development of personality over time. Westen identifies subsequent research support for all of these ideas.

More modern iterations of Freud's clinical approach have been empirically demonstrated to be effective (Knekt et al., 2008; Shedler, 2010). Some current practices in psychotherapy involve examining unconscious aspects of the self and relationships, often through the relationship between the therapist and the client. Freud's historical significance and contributions to clinical practice merit his inclusion in a discussion of the historical movements within psychology.

Wertheimer, Koffka, Köhler, and Gestalt Psychology

Max Wertheimer (1880–1943), Kurt Koffka (1886–1941), and Wolfgang Köhler (1887–1967) were three German psychologists who immigrated to the United States in the early 20th century to escape Nazi Germany. These men are credited with introducing psychologists in the United States to various Gestalt principles. The word *Gestalt* roughly translates to “whole”; a major emphasis of Gestalt psychology deals with the fact that although a sensory experience can be broken down into individual parts, how those parts relate to each other as a whole is often what the individual responds to in perception. For example, a song may be made up of individual notes played by different instruments, but the real nature of the song is perceived in the combinations of these notes as they form the melody, rhythm, and harmony. In many ways, this particular perspective would have directly contradicted Wundt's ideas of structuralism (Thorne & Henley, 2005).

Unfortunately, in moving to the United States, these men were forced to abandon much of their work and were unable to continue to conduct research on a large scale. These factors along with the rise of behaviorism (described next) in the United States prevented principles of Gestalt psychology from being as influential in the United States as they had been in their native Germany (Thorne & Henley, 2005). Despite these issues, several Gestalt principles are still very influential today. Considering the human individual as a whole rather than as a sum of individually measured parts became an important foundation in humanistic theory late in the century. The ideas of Gestalt have continued to influence research on sensation and perception.

Structuralism, Freud, and the Gestalt psychologists were all concerned in one way or another with describing and understanding inner experience. But other researchers had concerns that inner experience could

be a legitimate subject of scientific inquiry and chose instead to exclusively study behavior, the objectively observable outcome of mental processes.

Pavlov, Watson, Skinner, and Behaviorism

Early work in the field of behavior was conducted by the Russian physiologist Ivan Pavlov (1849–1936). Pavlov studied a form of learning behavior called a conditioned reflex, in which an animal or human produced a reflex (unconscious) response to a stimulus and, over time, was conditioned to produce the response to a different stimulus that the experimenter associated with the original stimulus. The reflex Pavlov worked with was salivation in response to the presence of food. The salivation reflex could be elicited using a second stimulus, such as a specific sound, that was presented in association with the initial food stimulus several times. Once the response to the second stimulus was “learned,” the food stimulus could be omitted. Pavlov’s “classical conditioning” is only one form of learning behavior studied by behaviorists.

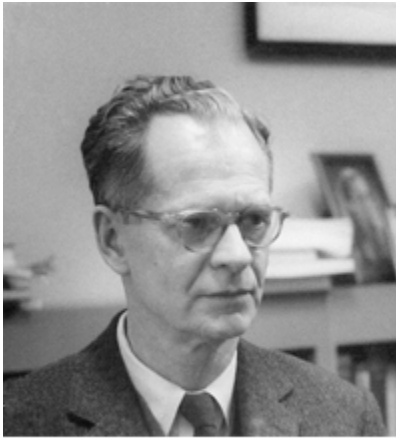
John B. Watson (1878–1958) was an influential American psychologist whose most famous work occurred during the early 20th century at Johns Hopkins University. While Wundt and James were concerned with understanding conscious experience, Watson thought that the study of consciousness was flawed. Because he believed that objective analysis of the mind was impossible, Watson preferred to focus directly on observable behavior and try to bring that behavior under control. Watson was a major proponent of shifting the focus of psychology from the mind to behavior, and *this approach of observing and controlling behavior came to be known as behaviorism*. A major object of study by behaviorists was learned behavior and its interaction with the inborn qualities of the organism. Behaviorism commonly used animals in experiments under the assumption that what was learned using animal models could, to some degree, be applied to human behavior. Indeed, Tolman (1938) stated, “I believe that everything important in psychology (except ... such matters as involve society and words) can be investigated in essence through the continued experimental and theoretical analysis of the determiners of rat behavior at a choice-point in a maze.”



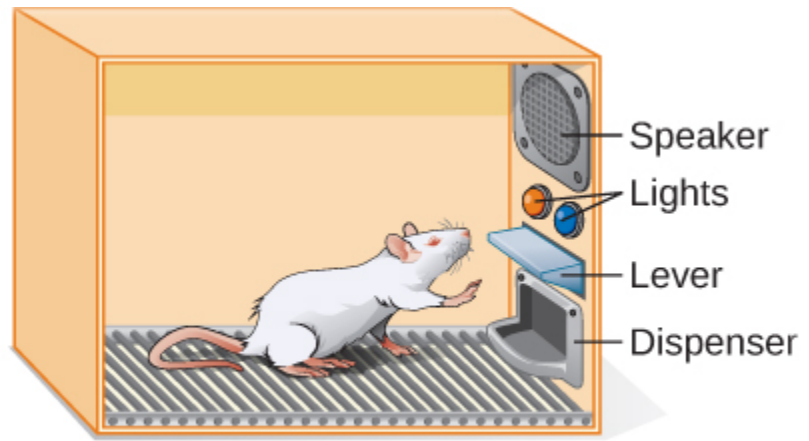
John B. Watson is known as the father of behaviorism within psychology.

Behaviorism dominated experimental psychology for several decades, and its influence can still be felt today (Thorne & Henley, 2005). Behaviorism is largely responsible for establishing psychology as a scientific discipline through its objective methods and especially experimentation. In addition, it is used in behavioral and cognitive-behavioral therapy. Behavior modification is commonly used in classroom settings. Behaviorism has also led to research on environmental influences on human behavior.

B. F. Skinner (1904–1990) was an American psychologist. Like Watson, Skinner was a behaviorist, and he concentrated on how behavior was affected by its consequences. Therefore, Skinner spoke of reinforcement and punishment as major factors in driving behavior. As a part of his research, Skinner developed a chamber that allowed the careful study of the principles of modifying behavior through reinforcement and punishment. This device, known as an operant conditioning chamber (or more familiarly, a Skinner box), has remained a crucial resource for researchers studying behavior (Thorne & Henley, 2005).



(a)



(b)

(a) B. F. Skinner is famous for his research on operant conditioning. (b) Modified versions of the operant conditioning chamber, or Skinner box, are still widely used in research settings today. (credit a: modification of work by “Silly rabbit”/Wikimedia Commons)

The Skinner box is a chamber that isolates the subject from the external environment and has a behavior indicator such as a lever or a button. When the animal pushes the button or lever, the box is able to deliver a positive reinforcement of the behavior (such as food) or a punishment (such as a noise) or a token conditioner (such as a light) that is correlated with either the positive reinforcement or punishment.

Skinner’s focus on positive and negative reinforcement of learned behaviors had a lasting influence in psychology that has waned somewhat since the growth of research in cognitive psychology. Despite this, conditioned learning is still used in human behavioral modification. Skinner’s two widely read and controversial popular science books about the value of operant conditioning for creating happier lives remain as thought-provoking arguments for his approach (Greengrass, 2004).

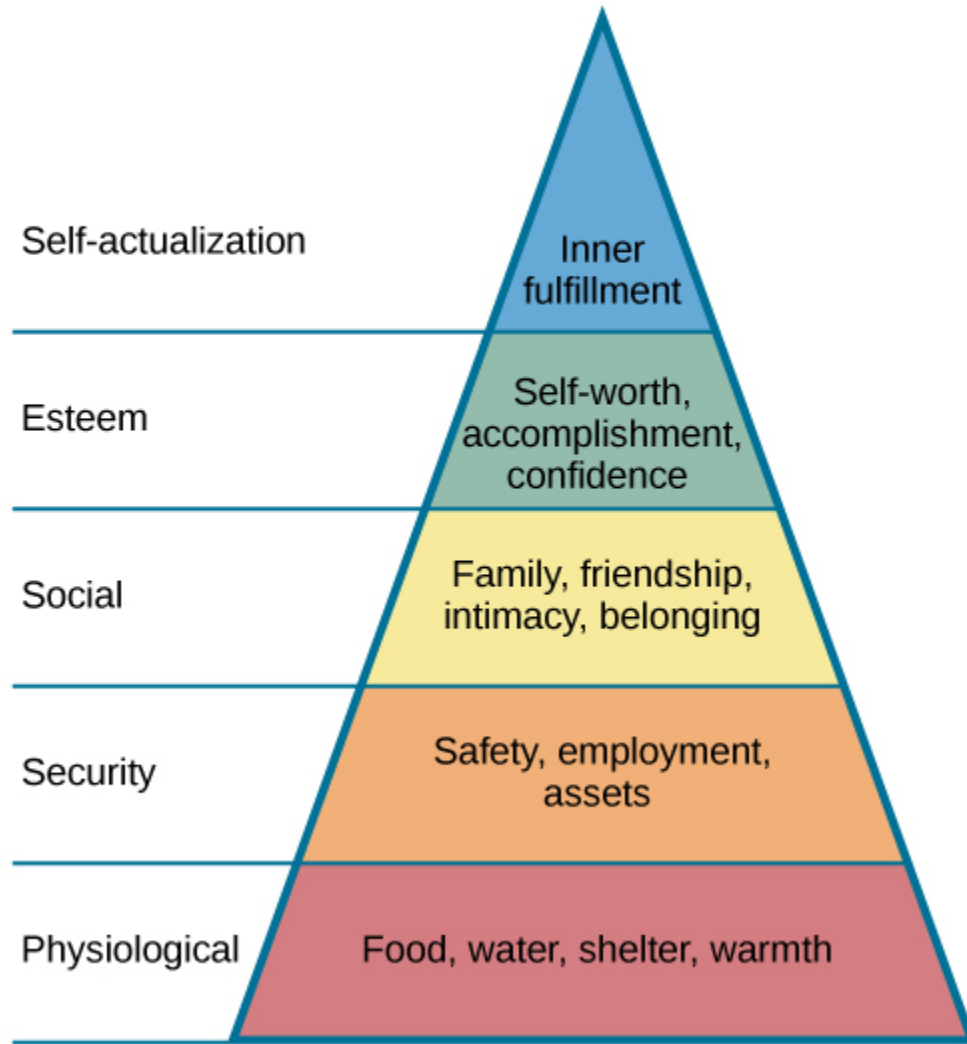
Maslow, Rogers, And Humanism

During the early 20th century, American psychology was dominated by behaviorism and psychoanalysis. However, some psychologists were uncomfortable with what they viewed as limited perspectives being so influential to the field. They objected to the pessimism and determinism (all actions driven by the unconscious) of Freud. They also disliked the reductionism, or simplifying nature, of behaviorism. Behaviorism is also deterministic at its core, because it sees human behavior as entirely determined by a combination of genetics and environment. Some psychologists began to form ideas that emphasized personal control, intentionality, and a true predisposition for “good” as important for our self-concept and our behavior. Thus, humanism emerged. **Humanism** is a perspective within psychology that emphasizes the potential for good that is innate to all

humans. Two of the most well-known proponents of humanistic psychology are Abraham Maslow and Carl Rogers (O'Hara, n.d.).

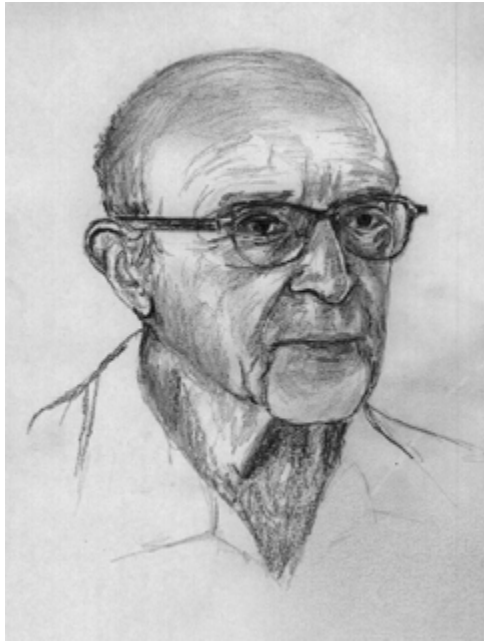
Abraham Maslow (1908–1970) was an American psychologist who is best known for proposing a hierarchy of human needs in motivating behavior. Although this concept will be discussed in more detail in a later chapter, a brief overview will be provided here. Maslow asserted that so long as basic needs necessary for survival were met (e.g., food, water, shelter), higher-level needs (e.g., social needs) would begin to motivate behavior. According to Maslow, the highest-level needs relate to self-actualization, a process by which we achieve our full potential. Obviously, the focus on the positive aspects of human nature that are characteristic of the humanistic perspective is evident (Thorne & Henley, 2005). Humanistic psychologists rejected, on principle, the research approach based on reductionist experimentation in the tradition of the physical and biological sciences, because it missed the “whole” human being. Beginning with Maslow and Rogers, there was an insistence on a humanistic research program. This program has been largely qualitative (not measurement-based), but there exist a number of quantitative research strains within humanistic psychology, including research on happiness, self-concept, meditation, and the outcomes of humanistic psychotherapy (Friedman, 2008).

Maslow's Hierarchy of Needs



[\[Maslow's Hierarchy of Needs Image description\]](#)

Carl Rogers (1902–1987) was also an American psychologist who, like Maslow, emphasized the potential for good that exists within all people. Rogers used a therapeutic technique known as client-centered therapy in helping his clients deal with problematic issues that resulted in their seeking psychotherapy. Unlike a psychoanalytic approach in which the therapist plays an important role in interpreting what conscious behavior reveals about the unconscious mind, client-centered therapy involves the patient taking a lead role in the therapy session. Rogers believed that a therapist needed to display three features to maximize the effectiveness of this particular approach: unconditional positive regard, genuineness, and empathy. Unconditional positive regard refers to the fact that the therapist accepts their client for who they are, no matter what he or she might say. Provided these factors, Rogers believed that people were more than capable of dealing with and working through their own issues (Thorne & Henley, 2005).



Carl Rogers, shown in this portrait, developed a client-centered therapy method that has been influential in clinical settings. (credit: "Didius"/Wikimedia Commons)

Humanism has been influential to psychology. Both Maslow and Rogers are well-known names among students of psychology (you will read more about both men later in this text), and their ideas have influenced many scholars. Furthermore, Rogers' client-centered approach to therapy is still commonly used in psychotherapeutic settings today (O'Hara, n.d.)

View a brief video of Carl Rogers describing his therapeutic approach: [Carl Rogers on Person-Centered Therapy Video](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=138#oembed-1>

The Cognitive Revolution

Behaviorism's emphasis on objectivity and focus on external behavior had pulled psychologists' attention away from the mind for a prolonged period of time. The early work of humanistic psychologists redirected attention to the individual human as a whole, and as a conscious and self-aware being. By the 1950s, new disciplinary perspectives in linguistics, neuroscience, and computer science were emerging, and these areas revived interest in the mind as a focus of scientific inquiry. This particular perspective has come to be known as the cognitive revolution (Miller, 2003). By 1967, Ulric Neisser published the first textbook entitled *Cognitive Psychology*, which served as a core text in cognitive psychology courses around the country (Thorne & Henley, 2005).

Although no one person is entirely responsible for starting the cognitive revolution, Noam Chomsky was very influential in the early days of this movement. Chomsky (1928–), an American linguist, was dissatisfied with the influence that behaviorism had had on psychology. He believed that psychology's focus on behavior was short-sighted and that the field had to re-incorporate mental functioning into its purview if it were to offer any meaningful contributions to understanding behavior (Miller, 2003).



Noam Chomsky was very influential in beginning the cognitive revolution. In 2010, this mural honoring him was put up in Philadelphia, Pennsylvania.
(credit: Robert Moran)

European psychology had never really been as influenced by behaviorism as had American psychology; and thus, the cognitive revolution helped reestablish lines of communication between European psychologists and their American counterparts. Furthermore, psychologists began to cooperate with scientists in other fields, like anthropology, linguistics, computer science, and neuroscience, among others. This interdisciplinary approach often was referred to as the cognitive sciences, and the influence and prominence of this particular perspective resonates in modern-day psychology (Miller, 2003).

FEMINIST PSYCHOLOGY

The science of psychology has had an impact on human well-being, both positive and negative. The dominant influence of Western, white, and male academics in the early history of psychology meant that psychology developed with the biases inherent in those individuals, which often had negative consequences for members of society who were not white or male. Women, members of ethnic minorities in both the United States and other countries, and individuals with sexual orientations other than heterosexual had difficulties entering the field of psychology and therefore influencing its development. They also suffered from the attitudes of white, male psychologists, who were not immune to the nonscientific attitudes prevalent in the society in which they developed and worked. Until the 1960s, the science of psychology was largely a “womanless” psychology (Crawford & Marecek, 1989), meaning that few women were able to practice psychology, so they had little influence on what was studied. In addition, the experimental subjects of psychology were mostly men, which resulted from underlying assumptions that gender had no influence on psychology and that women were not of sufficient interest to study.

An article by Naomi Weisstein, first published in 1968 (Weisstein, 1993), stimulated a feminist revolution in psychology by presenting a critique of psychology as a science. She also specifically criticized male psychologists for constructing the psychology of women entirely out of their own cultural biases and without careful experimental tests to verify any of their characterizations of women. Weisstein used, as examples, statements by prominent psychologists in the 1960s, such as this quote by Bruno Bettelheim: “. . . we must start with the realization that, as much as women want to be good scientists or engineers, they want first and foremost to be womanly companions of men and to be mothers.” Weisstein’s critique formed the foundation for the subsequent development of feminist psychology that attempted to be free of the influence of male cultural biases on our knowledge of the psychology of women and, indeed, of both genders.

Crawford & Marecek (1989) identify several feminist approaches to psychology that can be described as feminist psychology. These include re-evaluating and discovering the contributions of women to the history of psychology, studying psychological gender differences, and questioning the male bias present across the practice of the scientific approach to knowledge.

Multicultural Psychology

Culture has important impacts on individuals and social psychology, yet the effects of culture on psychology are under-studied. There is a risk that psychological theories and data derived from white, American settings could be assumed to apply to individuals and social groups from other cultures, but this is unlikely to be true (Betancourt & López, 1993). One weakness in the field of cross-cultural psychology is that in looking for differences in psychological attributes across cultures, there remains a need to go beyond simple descriptive

statistics (Betancourt & López, 1993). In this sense, it has remained a descriptive science, rather than one seeking to determine cause and effect. For example, a study of characteristics of individuals seeking treatment for a binge eating disorder in Hispanic American, African American, and Caucasian American individuals found significant differences between groups (Franko et al., 2012). The study concluded that results from studying any one of the groups could not be extended to the other groups, and yet potential causes of the differences were not measured.

The history of multicultural psychology in the United States is a long one. The role of African American psychologists in researching the cultural differences between African American individuals and social psychology is but one example. In 1920, Cecil Sumner was the first African American to receive a Ph.D. in psychology in the United States. Sumner established a psychology degree program at Howard University, leading to the education of a new generation of African American psychologists (Black, Spence, and Omari, 2004). Much of the work of early African American psychologists (and a general focus of much work in the first half of the 20th century in psychology in the United States) was dedicated to testing, and intelligence testing in particular (Black et al., 2004). That emphasis has continued, particularly because of the importance of testing in determining opportunities for children, but other areas of exploration in African-American psychology research include learning style, sense of community and belonging, and spiritualism (Black et al., 2004).

The American Psychological Association has several ethnically based organizations for professional psychologists that facilitate interactions among members. Since psychologists belonging to specific ethnic groups or cultures have the most interest in studying the psychology of their communities, these organizations provide an opportunity for the growth of research on the impact of culture on individual and social psychology.

Read a news story about the influence of an African American's psychology research on the historic *Brown v. Board of Education* civil rights case: [Doll Cultural Study Had Impact on "Brown v. Board."](#)

Summary

Before the time of Wundt and James, questions about the mind were considered by philosophers. However, both Wundt and James helped create psychology as a distinct scientific discipline. Wundt was a structuralist, which meant he believed that our cognitive experience was best understood by breaking that experience into its component parts. He thought this was best accomplished by introspection.

William James was the first American psychologist, and he was a proponent of functionalism. This

particular perspective focused on how mental activities served as adaptive responses to an organism's environment. Like Wundt, James also relied on introspection; however, his research approach also incorporated more objective measures as well.

Sigmund Freud believed that understanding the unconscious mind was absolutely critical to understanding conscious behavior. This was especially true for individuals that he saw who suffered from various hysterias and neuroses. Freud relied on dream analysis, slips of the tongue, and free association as means to access the unconscious. The psychoanalytic theory remained a dominant force in clinical psychology for several decades.

Gestalt psychology was very influential in Europe. Gestalt psychology takes a holistic view of an individual and his experiences. As the Nazis came to power in Germany, Wertheimer, Koffka, and Köhler immigrated to the United States. Although they left their laboratories and their research behind, they did introduce America to Gestalt ideas. Some of the principles of Gestalt psychology are still very influential in the study of sensation and perception.

One of the most influential schools of thought in psychology's history was behaviorism. Behaviorism focuses on making psychology an objective science by studying overt behavior and deemphasizing the importance of unobservable mental processes. John Watson is often considered the father of behaviorism, and B. F. Skinner's contributions to our understanding of the principles of operant conditioning cannot be underestimated.

As behaviorism and psychoanalytic theory took hold of so many aspects of psychology, some began to become dissatisfied with psychology's picture of human nature. Thus, a humanistic movement within psychology began to take hold. Humanism focuses on the potential of all people for good. Both Maslow and Rogers were influential in shaping humanistic psychology.

During the 1950s, the landscape of psychology began to change. The science of behavior began to shift back to its roots of focus on mental processes. The emergence of neuroscience and computer science aided this transition. Ultimately, the cognitive revolution took hold, and people came to realize that cognition was crucial to a true appreciation and understanding of behavior.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it

online here:

<https://louis.pressbooks.pub/intropsychology/?p=138#h5p-28>

Critical Thinking Questions

How did the object of study in psychology change over the history of the field since the 19th century?

In its early days, psychology could be defined as the scientific study of mind or mental processes. Over time, psychology began to shift more towards the scientific study of behavior. However, as the cognitive revolution took hold, psychology once again began to focus on mental processes as necessary to the understanding of behavior.

In part, what aspect of psychology was the behaviorist approach to psychology a reaction to? Behaviorists studied objectively observable behavior partly in reaction to the psychologists of the mind who were studying things that were not directly observable.

Personal Application Questions

Freud is probably one of the most well-known historical figures in psychology. Where have you encountered references to Freud or his ideas about the role that the unconscious mind plays in determining conscious behavior?

Glossary



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=138#h5p-29>

Image Descriptions

Maslow’s Hierarchy of Needs Image Description: A pyramid shape divided into five horizontal sections that are labelled. From top to bottom, the triangle’s sections are labeled as follows:

- Self-actualization corresponds to “Inner fulfillment”;
- Esteem corresponds to “Self-worth, accomplishment, confidence”;
- Social corresponds to “Family, friendship, intimacy, belonging”;
- Security corresponds to “Safety, employment, assets”;
- Physiological corresponds to “Food, water, shelter, warmth.”

[\[Return to Maslow’s Hierarchy of Needs image\]](#)

Media Attributions

- “[Carl Rogers on Person-Centered Therapy Video](#)” by [PsychotherapyNet](#). Standard YouTube License.

3.

CONTEMPORARY PSYCHOLOGY

Learning Objectives

By the end of this section, you will be able to:

- Appreciate the diversity of interests and foci within psychology
- Understand basic interests and applications in each of the described areas of psychology
- Demonstrate familiarity with some of the major concepts or important figures in each of the described areas of psychology

Contemporary psychology is a diverse field that is influenced by all of the historical perspectives described in the preceding section. Reflective of the discipline's diversity is the diversity seen within the **American Psychological Association (APA)**. The APA *is a professional organization representing psychologists in the United States*. The APA is the largest organization of psychologists in the world, and its mission is to advance and disseminate psychological knowledge for the betterment of people. There are 56 divisions within the APA, representing a wide variety of specialties that range from Societies for the Psychology of Religion and Spirituality to Exercise and Sport Psychology to Behavioral Neuroscience and Comparative Psychology. Reflecting the diversity of the field of psychology itself, members, affiliate members, and associate members span the spectrum from students to doctoral-level psychologists and come from a variety of places, including educational settings, criminal justice, hospitals, the armed forces, and industry (American Psychological Association, 2014). The Association for Psychological Science (APS) was founded in 1988 and seeks to advance the scientific orientation of psychology. Its founding resulted from disagreements between members of the scientific and clinical branches of psychology within the APA. The APS publishes five research journals and engages in education and advocacy with funding agencies. A significant proportion of its members are international, although the majority is located in the United States. Other organizations provide networking and collaboration opportunities for professionals of several ethnic or racial groups working in psychology, such as the National Latina/o Psychological Association (NLPA), the Asian American Psychological Association

(AAPA), the Association of Black Psychologists (ABPsi), and the Society of Indian Psychologists (SIP). Most of these groups are also dedicated to studying psychological and social issues within their specific communities.

This section will provide an overview of the major subdivisions within psychology today in the order in which they are introduced throughout the remainder of this textbook. This is not meant to be an exhaustive listing, but it will provide insight into the major areas of research and practice of modern-day psychologists.

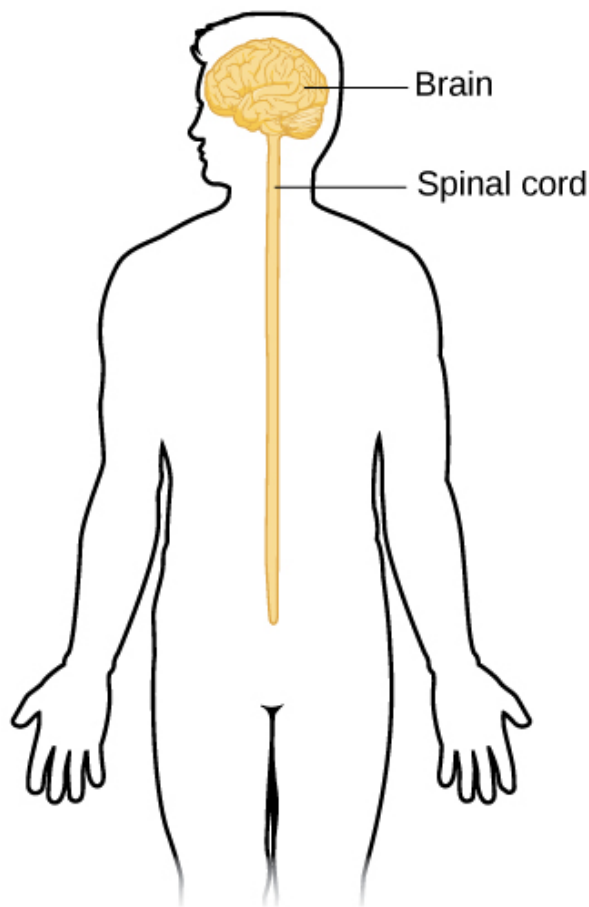
Please visit this website to learn about the divisions within the APA: [Divisions of APA](#).

Student resources are also provided by the APA: [Especially for Students](#).

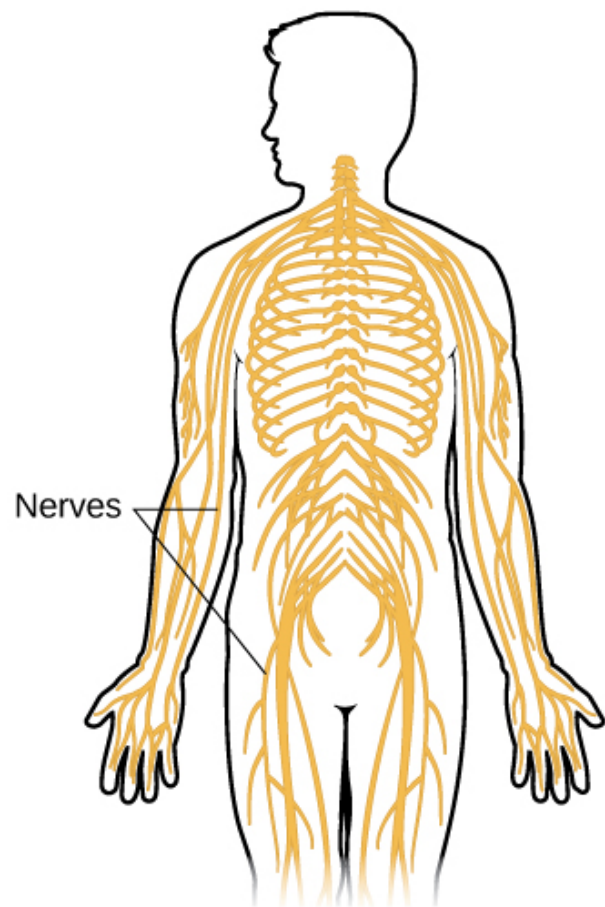
Biopsychology and Evolutionary Psychology

As the name suggests, **biopsychology** *explores how our biology influences our behavior*. While biological psychology is a broad field, many biological psychologists want to understand how the structure and function of the nervous system is related to behavior. As such, they often combine the research strategies of both psychologists and physiologists to accomplish this goal (as discussed in Carlson, 2013).

Central Nervous System



Peripheral Nervous System



Biological psychologists study how the structure and function of the nervous system generate behavior.

The research interests of biological psychologists span a number of domains, including but not limited to, sensory and motor systems, sleep, drug use and abuse, ingestive behavior, reproductive behavior, neurodevelopment, plasticity of the nervous system, and biological correlates of psychological disorders. Given the broad areas of interest falling under the purview of biological psychology, it will probably come as no surprise that individuals from all sorts of backgrounds are involved in this research, including biologists, medical professionals, physiologists, and chemists. This interdisciplinary approach is often referred to as neuroscience, of which biological psychology is a component (Carlson, 2013).

While biopsychology typically focuses on the immediate causes of behavior based in the physiology of a human or other animal, evolutionary psychology seeks to study the ultimate biological causes of behavior. To the extent that a behavior is impacted by genetics, a behavior, like any anatomical characteristic of a human or animal, will demonstrate adaption to its surroundings. These surroundings include the physical environment and, since interactions between organisms can be important to survival and reproduction, the social environment. The study of behavior in the context of evolution has its origins with Charles Darwin, the co-discoverer of the theory of evolution by natural selection. Darwin was well aware that behaviors should be

adaptive and wrote books titled *The Descent of Man* (1871) and *The Expression of the Emotions in Man and Animals* (1872) to explore this field.

Evolutionary psychology, and specifically the evolutionary psychology of humans, has enjoyed a resurgence in recent decades. To be subject to evolution by natural selection, a behavior must have a significant genetic cause. In general, we expect all human cultures to express a behavior if it is caused genetically, since the genetic differences among human groups are small. The approach taken by most evolutionary psychologists is to predict the outcome of a behavior in a particular situation based on evolutionary theory and then to make observations, or conduct experiments, to determine whether the results match the theory. It is important to recognize that these types of studies are not strong evidence that a behavior is adaptive, since they lack information that the behavior is in some part genetic and not entirely cultural (Endler, 1986). Demonstrating that a trait, especially in humans, is naturally selected is extraordinarily difficult; perhaps for this reason, some evolutionary psychologists are content to assume the behaviors they study have genetic determinants (Confer et al., 2010).

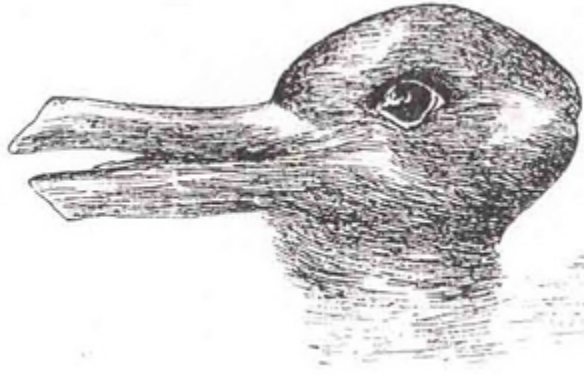
One other drawback of evolutionary psychology is that the traits that we possess now evolved under environmental and social conditions far back in human history, and we have a poor understanding of what these conditions were. This makes predictions about what is adaptive for a behavior difficult. Behavioral traits need not be adaptive under current conditions, only under the conditions of the past when they evolved, about which we can only hypothesize.

There are many areas of human behavior for which evolution can make predictions. Examples include memory, mate choice, relationships between kin, friendship and cooperation, parenting, social organization, and status (Confer et al., 2010).

Evolutionary psychologists have had success in finding experimental correspondence between observations and expectations. In one example, in a study of mate preference differences between men and women that spanned 37 cultures, Buss (1989) found that women valued earning potential factors greater than men, and men valued potential reproductive factors (youth and attractiveness) greater than women in their prospective mates. In general, the predictions were in line with the predictions of evolution, although there were deviations in some cultures.

Sensation And Perception

Scientists interested in both physiological aspects of sensory systems as well as in the psychological experience of sensory information work within the area of sensation and perception. As such, sensation and perception research is also quite interdisciplinary. Imagine walking between buildings as you move from one class to another. You are inundated with sights, sounds, touch sensations, and smells. You also experience the temperature of the air around you and maintain your balance as you make your way. These are all factors of interest to someone working in the domain of sensation and perception.



When you look at this image, you may see a duck or a rabbit. The sensory information remains the same, but your perception can vary dramatically.

As described in a later chapter that focuses on the results of studies in sensation and perception, our experience of our world is not as simple as the sum total of all of the sensory information (or sensations) together. Rather, our experience (or perception) is complex and is influenced by where we focus our attention, our previous experiences, and even our cultural backgrounds.

Cognitive Psychology

As mentioned in the previous section, the cognitive revolution created an impetus for psychologists to focus their attention on better understanding the mind and mental processes that underlie behavior. Thus, cognitive psychology is the area of psychology that focuses on studying cognitions, or thoughts, and their relationship to our experiences and our actions. Like biological psychology, cognitive psychology is broad in its scope and often involves collaborations among people from a diverse range of disciplinary backgrounds. This has led some to coin the term cognitive science to describe the interdisciplinary nature of this area of research (Miller, 2003).

Cognitive psychologists have research interests that span a spectrum of topics, ranging from attention to problem-solving to language to memory. The approaches used in studying these topics are equally diverse. Given such diversity, cognitive psychology is not captured in one chapter of this text per se; rather, various concepts related to cognitive psychology will be covered in relevant portions of the chapters in this text on sensation and perception, thinking and intelligence, memory, lifespan development, social psychology, and therapy.

View a brief video recapping some of the major concepts explored by cognitive psychologists:
[1.2 – Lesson 1 – introduction to cognitive psychology.](#)



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=140#oembed-1>

Developmental Psychology

Developmental psychology *is the scientific study of development across a lifespan.* Developmental psychologists are interested in processes related to physical maturation. However, their focus is not limited to the physical changes associated with aging, as they also focus on changes in cognitive skills, moral reasoning, social behavior, and other psychological attributes.

Early developmental psychologists focused primarily on changes that occurred through reaching adulthood, providing enormous insight into the differences in physical, cognitive, and social capacities that exist between very young children and adults. For instance, research by Jean Piaget demonstrated that very young children do not demonstrate object permanence. Object permanence refers to the understanding that physical things continue to exist, even if they are hidden from us. If you were to show an adult a toy, and then hide it behind a curtain, the adult knows that the toy still exists. However, very young infants act as if a hidden object no longer exists. The age at which object permanence is achieved is somewhat controversial (Munakata, McClelland, Johnson, and Siegler, 1997).



Jean Piaget is famous for his theories regarding changes in cognitive ability that occur as we move from infancy to adulthood.

While Piaget focused on cognitive changes during infancy and childhood as we move to adulthood, there is an increasing interest in extending research into the changes that occur much later in life. This may be reflective of changing population demographics of developed nations as a whole. As more and more people live longer lives, the number of people of advanced age will continue to increase. Indeed, it is estimated that there were just over 40 million people aged 65 or older living in the United States in 2010. However, by 2020, this number was expected to increase to about 55 million. By the year 2050, it is estimated that nearly 90 million people in this country will be 65 or older (Department of Health and Human Services, n.d.).

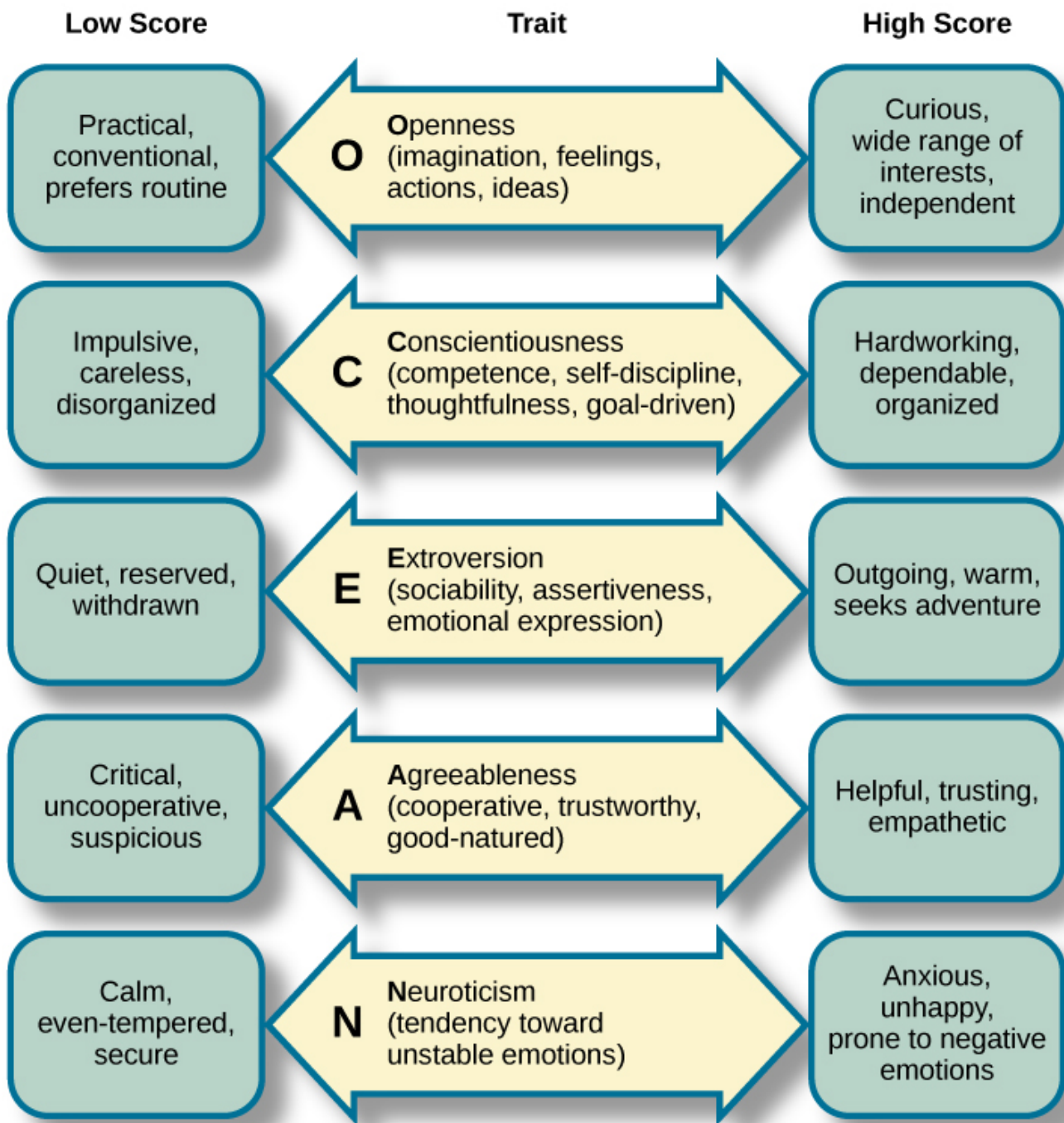
Personality Psychology

Personality psychology *focuses on patterns of thoughts and behaviors that make each individual unique.* Several individuals (e.g., Freud and Maslow) that we have already discussed in our historical overview of psychology, and the American psychologist Gordon Allport, contributed to early theories of personality. These early theorists attempted to explain how an individual's personality develops from his or her given perspective. For

example, Freud proposed that personality arose as conflicts between the conscious and unconscious parts of the mind were carried out over the lifespan. Specifically, Freud theorized that an individual went through various psychosexual stages of development. According to Freud, adult personality would result from the resolution of various conflicts that centered on the migration of erogenous (or sexual pleasure-producing) zones from the oral (mouth) to the anus to the phallus to the genitals. Like many of Freud's theories, this particular idea was controversial and did not lend itself to experimental tests (Person, 1980).

More recently, the study of personality has taken on a more quantitative approach. Rather than explaining how personality arises, research is focused on identifying personality traits, measuring these traits, and determining how these traits interact in a particular context to determine how a person will behave in any given situation. **Personality traits** *are relatively consistent patterns of thought and behavior*, and many have proposed that five trait dimensions are sufficient to capture the variations in personality seen across individuals. These five dimensions are known as the "Big Five" or the Five Factor model and include dimensions of conscientiousness, agreeableness, neuroticism, openness, and extroversion. Each of these traits has been demonstrated to be relatively stable over the lifespan (e.g., Rantanen, Metsäpelto, Feldt, Pulkkinen, and Kokko, 2007; Soldz & Vaillant, 1999; McCrae & Costa, 2008) and is influenced by genetics (e.g., Jang, Livesly, and Vernon, 1996).

Each of the dimensions of the Five Factor model is shown in this figure. The provided description would describe someone who scored highly on that given dimension. Someone with a lower score on a given dimension could be described in opposite terms.



[\[Five Factor Model image description\]](#)

Social Psychology

Social psychology focuses on how we interact with and relate to others. Social psychologists conduct research on a wide variety of topics that include differences in how we explain our own behavior versus how we explain the behaviors of others, prejudice, attraction, and how we resolve interpersonal conflicts. Social psychologists

have also sought to determine how being among other people changes our own behavior and patterns of thinking.

There are many interesting examples of social psychological research, and you will read about many of these in a later chapter of this textbook. Until then, you will be introduced to one of the most controversial psychological studies ever conducted. Stanley Milgram was an American social psychologist who is most famous for research that he conducted on obedience. After the Holocaust, in 1961, a Nazi war criminal, Adolf Eichmann, who was accused of committing mass atrocities, was put on trial. Many people wondered how German soldiers were capable of torturing prisoners in concentration camps, and they were unsatisfied with the excuses given by soldiers that they were simply following orders. At the time, most psychologists agreed that few people would be willing to inflict such extraordinary pain and suffering simply because they were obeying orders. Milgram decided to conduct research to determine whether or not this was true. As you will read later in the text, Milgram found that nearly two-thirds of his participants were willing to deliver what they believed to be lethal shocks to another person simply because they were instructed to do so by an authority figure (in this case, a man dressed in a lab coat). This was in spite of the fact that participants received payment just for showing up for the research study and could have chosen not to inflict pain or more serious consequences on another person by withdrawing from the study. No one was actually hurt or harmed in any way; Milgram's experiment was a clever ruse that took advantage of research confederates, those who pretend to be participants in a research study who are actually working for the researcher and have clear, specific directions on how to behave during the research study (Hock, 2009). Milgram's and others' studies that involved deception and potential emotional harm to study participants catalyzed the development of ethical guidelines for conducting psychological research that discourage the use of deception of research subjects, unless it can be argued not to cause harm and, in general, requires informed consent of participants.

Public Announcement

WE WILL PAY YOU \$4.00 FOR ONE HOUR OF YOUR TIME

Persons Needed for a Study of Memory

*We will pay five hundred New Haven men to help us complete a scientific study of memory and learning. The study is being done at Yale University.

*Each person who participates will be paid \$4.00 (plus 50c carfare) for approximately 1 hour's time. We need you for only one hour: there are no further obligations. You may choose the time you would like to come (evenings, weekdays, or weekends).

*No special training, education, or experience is needed. We want:

Factory workers	Businessmen	Construction workers
City employees	Clerks	Salespeople
Laborers	Professional people	White-collar workers
Barbers	Telephone workers	Others

All persons must be between the ages of 20 and 50. High school and college students cannot be used.

*If you meet these qualifications, fill out the coupon below and mail it now to Professor Stanley Milgram, Department of Psychology, Yale University, New Haven. You will be notified later of the specific time and place of the study. We reserve the right to decline any application.

*You will be paid \$4.00 (plus 50c carfare) as soon as you arrive at the laboratory.

TO:
PROF. STANLEY MILGRAM, DEPARTMENT OF PSYCHOLOGY,
YALE UNIVERSITY, NEW HAVEN, CONN. I want to take part in
this study of memory and learning. I am between the ages of 20 and
50. I will be paid \$4.00 (plus 50c carfare) if I participate.

NAME (Please Print)

ADDRESS

TELEPHONE NO. Best time to call you

AGE OCCUPATION SEX

CAN YOU COME:

WEEKDAYS EVENINGS WEEKENDS

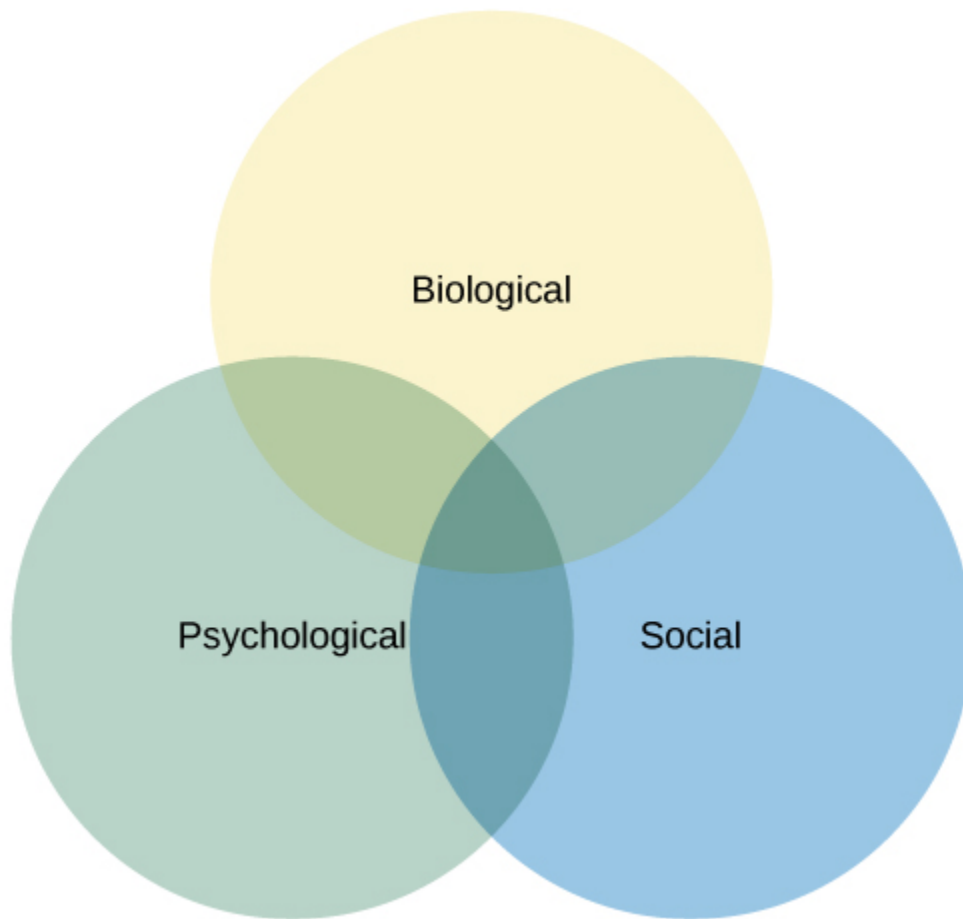
Stanley Milgram's research demonstrated just how far people will go in obeying orders from an authority figure. This advertisement was used to recruit subjects for his research.

Industrial-Organizational Psychology

Industrial-Organizational psychology (I-O psychology) is a subfield of psychology that applies psychological theories, principles, and research findings in industrial and organizational settings. I-O psychologists are often involved in issues related to personnel management, organizational structure, and workplace environment. Businesses often seek the aid of I-O psychologists to make the best hiring decisions as well as to create an environment that results in high levels of employee productivity and efficiency. In addition to its applied nature, I-O psychology also involves conducting scientific research on behavior within I-O settings (Riggio, 2013).

Health Psychology

Health psychology *focuses on how health is affected by the interaction of biological, psychological, and sociocultural factors*. This particular approach is known as the **biopsychosocial model**. Health psychologists are interested in helping individuals achieve better health through public policy, education, intervention, and research. Health psychologists might conduct research that explores the relationship between one's genetic makeup, patterns of behavior, relationships, psychological stress, and health. They may research effective ways to motivate people to address patterns of behavior that contribute to poorer health (MacDonald, 2013).



The biopsychosocial model suggests that health/illness is determined by an interaction of these three factors.

Sport and Exercise Psychology

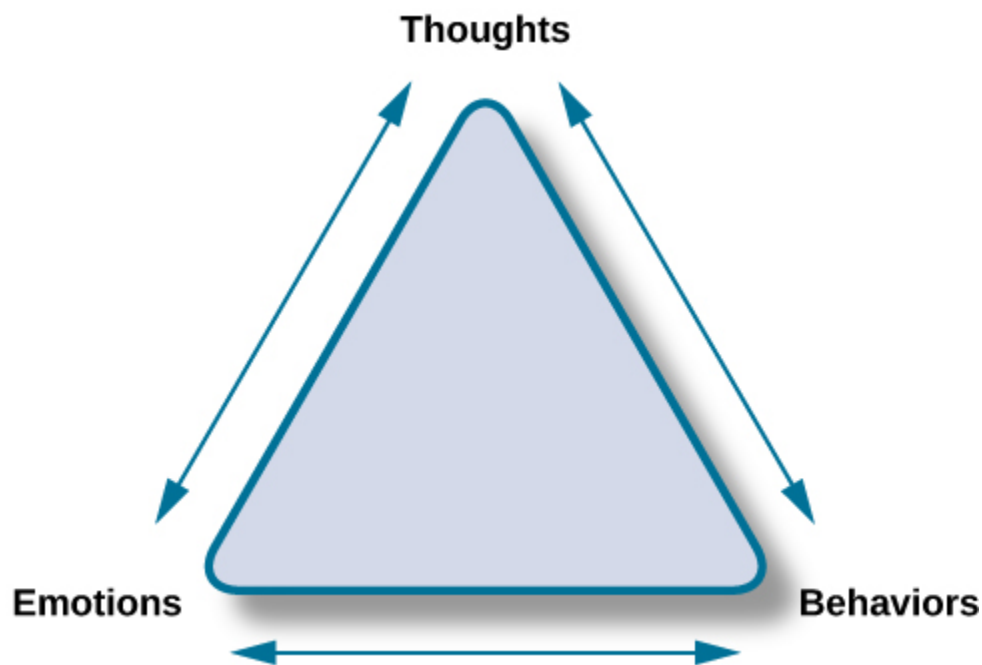
Researchers in **sport and exercise psychology** *study the psychological aspects of sport performance, including motivation and performance anxiety, and the effects of sport on mental and emotional wellbeing.* Research is also conducted on similar topics as they relate to physical exercise in general. The discipline also includes topics that are broader than sport and exercise but that are related to interactions between mental and physical performance under demanding conditions, such as firefighting, military operations, artistic performance, and surgery.

Clinical Psychology

Clinical psychology *is the area of psychology that focuses on the diagnosis and treatment of psychological disorders and other problematic patterns of behavior.* As such, it is generally considered to be a more applied

area within psychology; however, some clinicians are also actively engaged in scientific research. **Counseling psychology** is a similar discipline that focuses on emotional, social, vocational, and health-related outcomes in individuals who are considered psychologically healthy.

As mentioned earlier, both Freud and Rogers provided perspectives that have been influential in shaping how clinicians interact with people seeking psychotherapy. While aspects of the psychoanalytic theory are still found among some of today's therapists who are trained from a psychodynamic perspective, Roger's ideas about client-centered therapy have been especially influential in shaping how many clinicians operate. Furthermore, both behaviorism and the cognitive revolution have shaped clinical practice in the forms of behavioral therapy, cognitive therapy, and cognitive-behavioral therapy. Issues related to the diagnosis and treatment of psychological disorders and problematic patterns of behavior will be discussed in detail in later chapters of this textbook.



Cognitive-behavioral therapists take cognitive processes and behaviors into account when providing psychotherapy. This is one of several strategies that may be used by practicing clinical psychologists.

By far, this is the area of psychology that receives the most attention in popular media, and many people mistakenly assume that all psychology is clinical psychology.

Forensic Psychology

Forensic psychology is a branch of psychology that deals with questions of psychology as they arise in the context of the justice system. For example, forensic psychologists (and forensic psychiatrists) will assess a person's

competency to stand trial, assess the state of mind of a defendant, act as consultants on child custody cases, consult on sentencing and treatment recommendations, and advise on issues such as eyewitness testimony and children's testimony (American Board of Forensic Psychology, 2014). In these capacities, they will typically act as expert witnesses, called by either side in a court case to provide their research- or experience-based opinions. As expert witnesses, forensic psychologists must have a good understanding of the law and provide information in the context of the legal system rather than just within the realm of psychology. Forensic psychologists are also used in the jury selection process and witness preparation. They may also be involved in providing psychological treatment within the criminal justice system. Criminal profilers are a relatively small proportion of psychologists who act as consultants to law enforcement.

The APA provides career information about various areas of psychology: [Careers in Psychology](#).

Summary

Psychology is a diverse discipline that is made up of several major subdivisions with unique perspectives. Biological psychology involves the study of the biological bases of behavior. Sensation and perception refer to the area of psychology that is focused on how information from our sensory modalities is received and how this information is transformed into our perceptual experiences of the world around us. **Cognitive psychology** *is concerned with the relationship that exists between thought and behavior, and developmental psychologists study the physical and cognitive changes that occur throughout one's lifespan.* Personality psychology focuses on individuals' unique patterns of behavior, thought, and emotion. Industrial and organizational psychology, health psychology, sport and exercise psychology, forensic psychology, and clinical psychology are all considered applied areas of psychology. Industrial and organizational psychologists apply psychological concepts to I-O settings. Health psychologists look for ways to help people live healthier lives, and clinical psychology involves the diagnosis and treatment of psychological disorders and other problematic behavioral patterns. Sport and exercise psychologists study the interactions between thoughts, emotions, and physical performance in sports, exercise, and other activities. Forensic psychologists carry out activities related to psychology in association with the justice system.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=140#h5p-30>

Critical Thinking Questions

Given the incredible diversity among the various areas of psychology that were described in this section, how do they all fit together?

Although the different perspectives all operate on different levels of analyses, have different foci of interests, and different methodological approaches, all of these areas share a focus on understanding and/or correcting patterns of thought and/or behavior.

What are the potential ethical concerns associated with Milgram's research on obedience? Many people have questioned how ethical this particular research was. Although no one was actually harmed in Milgram's study, many people have questioned how the knowledge that you would be willing to inflict incredible pain and/or death to another person, simply because someone in authority told you to do so, would affect someone's self-concept and psychological health. Furthermore, the degree to which deception was used in this particular study raises a few eyebrows.

Personal Application Question

Now that you've been briefly introduced to some of the major areas within psychology, which are you most interested in learning more about? Why?

Image Descriptions

Five Factor Model image description: A diagram describing what a low and high score in each of the traits in the five factor model looks like:

Five Factor Model		
Trait	Low score	High score
O – Openness (imagination, feelings, actions, ideas)	Practical, conventional, prefers routine	Curious, wide range of interests, independent
C – Conscientiousness (competence, self-discipline, thoughtfulness, goal-driven)	Impulsive, careless, disorganized	Hardworking, dependable, organized
E – Extroversion (sociability, assertiveness, emotional expression)	Quiet, reserved, withdrawn	Outgoing, warm, seek adventure
A – Agreeableness (cooperative, trustworthy, good-natured)	Critical, uncooperative, suspicious	Helpful, trusting, empathetic
N – Neuroticism (tendency toward unstable emotions)	Calm, even-tempered, secure	Anxious, unhappy, prone to negative emotions

[\[Return to Five Factor Model image\]](#)

Media Attributions

- “[1.2 – Lesson 1 – introduction to cognitive psychology](#)” by [Abbey SocialScience](#). Standard YouTube License.

4.

REFERENCES

-
- American Board of Forensic Psychology. (2014). *Brochure*. Retrieved from <http://www.abfp.com/brochure.asp>
- American Psychological Association. (2014). Retrieved from www.apa.org
- American Psychological Association. (2014). *Graduate training and career possibilities in exercise and sport psychology*. Retrieved from <http://www.apadivisions.org/division-47/about/resources/training.aspx?item=1>
- American Psychological Association. (2011). *Psychology as a career*. Retrieved from <http://www.apa.org/education/undergrad/psych-career.aspx>
- Ashliman, D. L. (2001). Cupid and Psyche. In *Folktexts: A library of folktales, folklore, fairy tales, and mythology*. Retrieved from <http://www.pitt.edu/~dash/cupid.html>
- Betancourt, H., & López, S. R. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, 48, 629–637.
- Black, S. R., Spence, S. A., & Omari, S. R. (2004). Contributions of African Americans to the field of psychology. *Journal of Black Studies*, 35, 40–64.
- Bulfinch, T. (1855). *The age of fable: Or, stories of gods and heroes*. Boston, MA: Chase, Nichols and Hill.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1–49.
- Carlson, N. R. (2013). *Physiology of Behavior* (11th ed.). Boston, MA: Pearson.
- Confer, J. C., Easton, J. A., Fleischman, D. S., Goetz, C. D., Lewis, D. M. G., Perilloux, C., & Buss, D. M. (2010). Evolutionary psychology. Controversies, questions, prospects, and limitations. *American Psychologist*, 65, 100–126.
- Crawford, M., & Marecek, J. (1989). Psychology reconstructs the female 1968–1988. *Psychology of Women Quarterly*, 13, 147–165.
- Danziger, K. (1980). The history of introspection reconsidered. *Journal of the History of the Behavioral Sciences*, 16, 241–262.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- Darwin, C. (1872). *The expression of the emotions in man and animals*. London: John Murray.
- DeAngelis, T. (2010). Fear not. *gradPSYCH Magazine*, 8, 38.
- Department of Health and Human Services. (n.d.). Projected future growth of the older population. Retrieved from http://www.aoa.gov/Aging_Statistics/future_growth/future_growth.aspx#age

- Endler, J. A. (1986). *Natural Selection in the Wild*. Princeton, NJ: Princeton University Press.
- Fogg, N. P., Harrington, P. E., Harrington, T. F., & Shatkin, L. (2012). *College majors handbook with real career paths and payoffs* (3rd ed.). St. Paul, MN: JIST Publishing.
- Fontana, E., Adenzato, M., Penso, J. S., Enrici, I., & Ardito, R. B. (2018). On the relationship between Theory of Mind and syntax in clinical and non-clinical populations: State of the art and implications for research. *The Open Psychology Journal*, 11 (1).
- Franko, D. L., et al. (2012). Racial/ethnic differences in adults in randomized clinical trials of binge eating disorder. *Journal of Consulting and Clinical Psychology*, 80, 186–195.
- Friedman, H. (2008). Humanistic and positive psychology: The methodological and epistemological divide. *The Humanistic Psychologist*, 36, 113–126.
- Gordon, O. E. (1995). *A brief history of psychology*. Retrieved from <http://www.psych.utah.edu/gordon/Classes/Psy4905Docs/PsychHistory/index.html#maptop>
- Greek Myths & Greek Mythology. (2014). *The myth of Psyche and Eros*. Retrieved from <http://www.greekmyths-greekmythology.com/psyche-and-eros-myth/>
- Green, C. D. (2001). Classics in the history of psychology. Retrieved from <http://psychclassics.yorku.ca/Krstic/marulic.htm>
- Greengrass, M. (2004). 100 years of B.F. Skinner. *Monitor on Psychology*, 35, 80.
- Halonen, J. S. (2011). *White paper: Are there too many psychology majors?* Prepared for the Staff of the State University System of Florida Board of Governors. Retrieved from http://www.cogdop.org/page_attachments/0000/0200/FLA_White_Paper_for_cogop_posting.pdf
- Hock, R. R. (2009). Social psychology. *Forty studies that changed psychology: Explorations into the history of psychological research* (pp. 308–317). Upper Saddle River, NJ: Pearson.
- Hoffman, C. (2012). *Careers in clinical, counseling, or school psychology; mental health counseling; clinical social work; marriage & family therapy and related professions*. Retrieved from <http://www.indiana.edu/~psyugrad/advising/docs/Careers%20in%20Mental%20Health%20Counseling.pdf>
- Hunt, J. M. (1981). Comments on “the modification of intelligence through early experience” by Ramey and Haskins. *Intelligence*, 5(1), 21-27.
- Jang, K. L., Livesly, W. J., & Vernon, P. A. (1996). Heritability of the Big Five personality dimensions and their facets: A twin study. *Journal of Personality*, 64, 577–591.
- Johnson, R., & Lubin, G. (2011). College exposed: What majors are most popular, highest paying and most likely to get you a job. *Business Insider.com*. Retrieved from <http://www.businessinsider.com/best-college-majors-highest-income-most-employed-georgetwon-study-2011-6?op=1>
- Knekt, P. P., et al. (2008). Randomized trial on the effectiveness of long- and short-term psychodynamic psychotherapy and solution-focused therapy on psychiatric symptoms during a 3-year follow-up. *Psychological Medicine: A Journal of Research In Psychiatry And The Allied Sciences*, 38, 689–703.
- Landers, R. N. (2011, June 14). Grad school: Should I get a PhD or Master’s in I/O psychology? [Web log

- post]. Retrieved from <http://neoacademic.com/2011/06/14/grad-school-should-i-get-a-ph-d-or-masters-in-io-psychology/#.UuKKLfOnGg>
- Legg, S. & Hutter, M. (2007). Universal intelligence: A definition of machine intelligence. *Minds and Machines*, 17(4), 391-444.
- Macdonald, C. (2013). *Health psychology center presents: What is health psychology?* Retrieved from <http://healthpsychology.org/what-is-health-psychology/>
- McCrae, R. R. & Costa, P. T. (2008). Empirical and theoretical status of the five-factor model of personality traits. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *The Sage handbook of personality theory and assessment. Vol. 1 Personality theories and models*. London: Sage.
- Michalski, D., Kohout, J., Wicherski, M., & Hart, B. (2011). *2009 Doctorate Employment Survey*. APA Center for Workforce Studies. Retrieved from <http://www.apa.org/workforce/publications/09-doc-empl/index.aspx>
- Miller, G. A. (2003). The cognitive revolution: A historical perspective. *Trends in Cognitive Sciences*, 7, 141-144.
- Munakata, Y., McClelland, J. L., Johnson, M. H., & Siegler, R. S. (1997). Rethinking infant knowledge: Toward an adaptive process account of successes and failures in object permanence tasks. *Psychological Review*, 104, 689-713.
- Mundasad, S. (2013). *Word-taste synaesthesia: Tasting names, places, and Anne Boleyn*. Retrieved from <http://www.bbc.co.uk/news/health-21060207>
- Munsey, C. (2009). More states forgo a postdoc requirement. *Monitor on Psychology*, 40, 10.
- National Association of School Psychologists. (n.d.). *Becoming a nationally certified school psychologist (NCSP)*. Retrieved from <http://www.nasponline.org/CERTIFICATION/becomeNCSP.aspx>
- Nicolas, S., & Ferrand, L. (1999). Wundt's laboratory at Leipzig in 1891. *History of Psychology*, 2, 194-203.
- Norcross, J. C. (n.d.) Clinical versus counseling psychology: What's the diff? Available at <http://www.csun.edu/~hccpsy002/Clinical%20Versus%20Counseling%20Psychology.pdf>
- Norcross, J. C., & Castle, P. H. (2002). Appreciating the PsyD: The facts. *Eye on Psi Chi*, 7, 22-26.
- O'Connor, J. J., & Robertson, E. F. (2002). *John Forbes Nash*. Retrieved from <http://www-groups.dcs.st-and.ac.uk/~history/Biographies/Nash.html>
- O'Hara, M. (n.d.). Historic review of humanistic psychology. Retrieved from http://www.ahpweb.org/index.php?option=com_k2&view=item&layout=item&id=14&Itemid=24
- Person, E. S. (1980). Sexuality as the mainstay of identity: Psychoanalytic perspectives. *Signs*, 5, 605-630.
- Rantanen, J., Metsäpelto, R. L., Feldt, T., Pulkkinen, L., & Kokko, K. (2007). Long-term stability in the Big Five personality traits in adulthood. *Scandinavian Journal of Psychology*, 48, 511-518.
- Riggio, R. E. (2013). What is industrial/organizational psychology? *Psychology Today*. Retrieved from <http://www.psychologytoday.com/blog/cutting-edge-leadership/201303/what-is-industrialorganizational-psychology>

- Sacks, O. (2007). A neurologists notebook: The abyss, music and amnesia. *The New Yorker*. Retrieved from http://www.newyorker.com/reporting/2007/09/24/070924fa_fact_sacks?currentPage=all
- Shedler, J. (2010). The efficacy of psychodynamic psychotherapy. *American Psychologist*, 65(2), 98–109.
- Soldz, S., & Vaillant, G. E. (1999). The Big Five personality traits and the life course: A 45-year longitudinal study. *Journal of Research in Personality*, 33, 208–232.
- Thorne, B. M., & Henley, T. B. (2005). *Connections in the history and systems of psychology* (3rd ed.). Boston, MA: Houghton Mifflin Company.
- Tolman, E. C. (1938). The determiners of behavior at a choice point. *Psychological Review*, 45, 1–41.
- U.S. Department of Education, National Center for Education Statistics. (2013). *Digest of Education Statistics, 2012* (NCES 2014-015).
- Weisstein, N. (1993). Psychology constructs the female: Or, the fantasy life of the male psychologist (with some attention to the fantasies of his friends, the male biologist and the male anthropologist). *Feminism and Psychology*, 3, 195–210.
- Westen, D. (1998). The scientific legacy of Sigmund Freud, toward a psychodynamically informed psychological science. *Psychological Bulletin*, 124, 333–371.

PART II

THE SCIENCE OF PSYCHOLOGY

Chapter Learning Objective

By the end of this chapter, you will be able to:

- Describe what scientific principles, laws and theories, and research hypotheses are.
- Explain how various scientific research methods can be used to address psychological research questions.
- Discuss general ethical guidelines for conducting psychological research in humans and animals.



How does television content impact children's behavior? (credit: modification of work by "antisocialtory"/Flickr)

Have you ever wondered whether the violence you see on television affects your behavior? Are you more likely to behave aggressively in real life after watching people behave violently in dramatic situations on the screen? Or, could seeing fictional violence actually get aggression out of your system, causing you to be more peaceful? How are children influenced by the media they are exposed to? A psychologist interested in the relationship between behavior and exposure to violent images might ask these very questions.

The topic of violence in the media today is contentious. Since ancient times, humans have been concerned about the effects of new technologies on our behaviors and thinking processes. The Greek philosopher Socrates, for example, worried that writing—a new technology at that time—would diminish people’s ability to remember because they could rely on written records rather than committing information to memory. In our world of quickly changing technologies, questions about the effects of media continue to emerge. Many of us find ourselves with a strong opinion on these issues, only to find the person next to us bristling with the opposite view.

How can we go about finding answers that are supported not by mere opinion but by evidence that we can all agree on? The findings of psychological research can help us navigate issues like this.

5.

SCIENTIFIC THINKING

Learning Objectives

- Describe the principles of the scientific method and explain its importance in conducting and interpreting research.
- Differentiate laws from theories and explain how research hypotheses are developed and tested.
- Identify the role of the research hypothesis in psychological research.

Psychologists aren't the only people who seek to understand human behavior and solve social problems. Philosophers, religious leaders, and politicians, among others, also strive to provide explanations for human behavior. But psychologists believe that research is the best tool for understanding human beings and their relationships with others. Rather than accepting the claim of a philosopher that people do (or do not) have free will, a psychologist would collect data to empirically test whether or not people are able to actively control their own behavior. Rather than accepting a politician's contention that creating (or abandoning) a new center for mental health will improve the lives of individuals in the inner city, a psychologist would empirically assess the effects of receiving mental health treatment on the quality of life of the recipients. The statements made by psychologists are empirical, which means they are *based on systematic collection and analysis of data*.

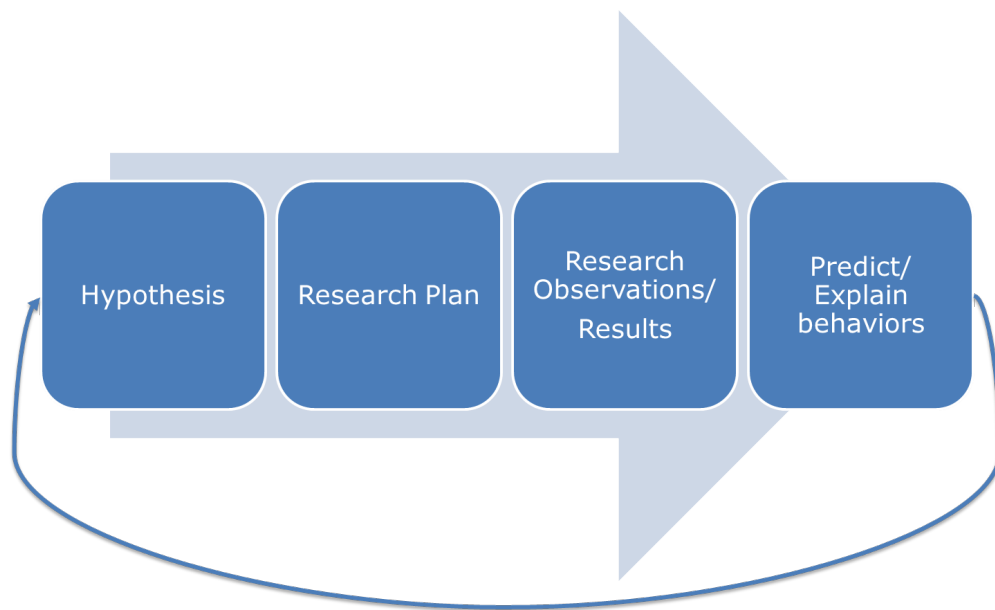
The Scientific Method

All scientists (whether they are physicists, chemists, biologists, sociologists, or psychologists) are engaged in the basic processes of collecting data and drawing conclusions about those data. The methods used by scientists have developed over many years and provide a common framework for developing, organizing, and sharing information. The **scientific method** is *the set of assumptions, rules, and procedures scientists use to conduct research*.

In addition to requiring that science be empirical, the scientific method demands that the procedures used be **objective**, or *free from the personal bias or emotions of the scientist*. The scientific method describes how scientists collect and analyze data, how they draw conclusions from data, and how they share data with others. These rules increase objectivity by placing data under the scrutiny of other scientists and even the public at large. Because data are reported objectively, other scientists know exactly how the scientist collected and analyzed the data. This means that they do not have to rely only on the scientist's own interpretation of the data; they may draw their own, potentially different, conclusions.

The scientific method is an iterative process. The scientific process often starts with making a hypothesis (which is also an educated guess). Then, research studies are designed to test the hypothesis. The results obtained from experiments then inform the researchers how behaviors may be predicted or explained. This is a recurring process in which the results then loop back to modify the hypothesis if necessary. With an updated hypothesis, researchers then continue to employ the scientific process to conduct experiments.

Figure 2.1 The scientific process employed by psychologists



The scientific process employed by psychologists

Most new research is designed to *replicate*—that is, to repeat, add to, or modify—previous research findings. The scientific method therefore results in an accumulation of scientific knowledge through the reporting of research and the addition to and modifications of these reported findings by other scientists.

Laws and Theories as Organizing Principles

One goal of research is to organize information into meaningful statements that can be applied in many situations. *Principles that are so general as to apply to all situations in a given domain of inquiry* are known

as laws. There are well-known laws in the physical sciences, such as the law of gravity and the laws of thermodynamics, and there are some universally accepted laws in psychology, such as the law of effect and Weber's law. But because laws are very general principles and their validity has already been well established, they are themselves rarely directly subjected to scientific testing.

The next step down from laws in the hierarchy of organizing principles is theory. A theory is *an integrated set of principles that explains and predicts many, but not all, observed relationships within a given domain of inquiry*. One example of an important theory in psychology is the stage theory of cognitive development proposed by the Swiss psychologist Jean Piaget. The theory states that children pass through a series of cognitive stages as they grow, each of which must be mastered in succession before movement to the next cognitive stage can occur. This is an extremely useful theory in human development because it can be applied to many different content areas and can be tested in many different ways.

Good theories have four important characteristics. First, good theories are *general*, meaning they summarize many different outcomes. Second, they are *parsimonious*, meaning they provide the simplest possible account of those outcomes. The stage theory of cognitive development meets both of these requirements. It can account for developmental changes in behavior across a wide variety of domains, and yet it does so parsimoniously—by hypothesizing a simple set of cognitive stages. Third, good theories *provide ideas for future research*. The stage theory of cognitive development has been applied not only to learning about cognitive skills but also to the study of children's moral (Kohlberg, 1966) and gender (Ruble & Martin, 1998) development.

Finally, good theories are falsifiable (Popper, 1959), which means *the variables of interest can be adequately measured and the relationships between the variables that are predicted by the theory can be shown through research to be incorrect*. The stage theory of cognitive development is falsifiable because the stages of cognitive reasoning can be measured and because if research discovers, for instance, that children learn new tasks before they have reached the cognitive stage hypothesized to be required for that task, then the theory will be shown to be incorrect.

No single theory is able to account for all behavior in all cases. Rather, theories are each limited in that they make accurate predictions in some situations or for some people but not in other situations or for other people. As a result, there is a constant exchange between theory and data: Existing theories are modified on the basis of collected data, and the newly modified theories then make new predictions that are tested by new data, and so forth. When a better theory is found, it will replace the old one. This is part of the accumulation of scientific knowledge.

The Research Hypothesis

Theories are usually framed too broadly to be tested in a single experiment. Therefore, scientists use a more precise statement of the presumed relationship among specific parts of a theory—a research hypothesis—as the basis for their research. A research hypothesis is a specific and falsifiable prediction about the relationship between or among two or more variables, where a variable is any attribute that can assume different values

among different people or across different times or places. The research hypothesis states the existence of a relationship between the variables of interest and the specific direction of that relationship. For instance, the research hypothesis “Using marijuana will reduce learning” predicts that there is a relationship between a variable “using marijuana” and another variable called “learning.” Similarly, in the research hypothesis “participating in psychotherapy will reduce anxiety,” the variables that are expected to be related are “participating in psychotherapy” and “level of anxiety.”

When stated in an abstract manner, the ideas that form the basis of a research hypothesis are known as conceptual variables. Conceptual variables are abstract ideas that form the basis of research hypotheses. Sometimes the conceptual variables are rather simple—for instance, “age,” “gender,” or “weight.” In other cases, the conceptual variables represent more complex ideas, such as “anxiety,” “cognitive development,” “learning,” “self-esteem,” or “sexism.”

The first step in testing a research hypothesis involves turning the conceptual variables into measured variables, which are variables consisting of numbers that represent the conceptual variables. For instance, the conceptual variable “participating in psychotherapy” could be represented as the measured variable “number of psychotherapy hours the patient has accrued,” and the conceptual variable “using marijuana” could be assessed by having the research participants rate, on a scale from 1 to 10, how often they use marijuana or by administering a blood test that measures the presence of the chemicals in marijuana.

Psychologists use the term operational definition to refer to a precise statement of how a conceptual variable is turned into a measured variable. The relationship between conceptual and measured variables in a research hypothesis is diagrammed in Figure 2.2 “Diagram of a Research Hypothesis.” The conceptual variables are represented within circles at the top of the figure, and the measured variables are represented within squares at the bottom. The two vertical arrows, which lead from the conceptual variables to the measured variables, represent the operational definitions of the two variables. The arrows indicate the expectation that changes in the conceptual variables (psychotherapy and anxiety in this example) will cause changes in the corresponding measured variables. The measured variables are then used to draw inferences about the conceptual variables.

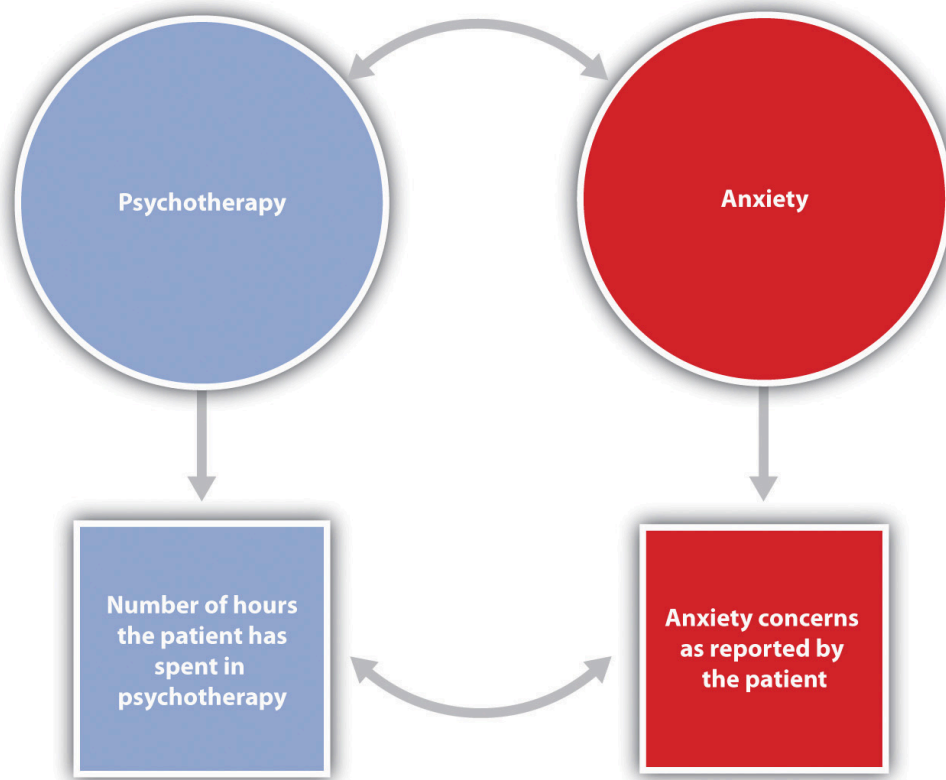


Figure 2.2 Diagram of a Research Hypothesis. In this research hypothesis, the conceptual variable of attending psychotherapy is operationalized using the number of hours of psychotherapy the client has completed, and the conceptual variable of anxiety is operationalized using self-reported levels of anxiety. The research hypothesis is that more psychotherapy will be related to less reported anxiety.

[Table 2.1, “Examples of the Operational Definitions of Conceptual Variables That Have Been Used in Psychological Research,”](#) lists some potential operational definitions of conceptual variables that have been used in psychological research. As you read through this list, note that in contrast to the abstract conceptual variables, the measured variables are very specific. This specificity is important for two reasons. First, more specific definitions mean that there is less danger that the collected data will be misunderstood by others. Second, specific definitions will enable future researchers to replicate the research.

Table 2.1 Examples of the Operational Definitions of Conceptual Variables That Have Been Used in Psychological Research

Conceptual variable	Operational definitions
Aggression	<ul style="list-style-type: none">• Number of presses of a button that administers shock to another student• Number of seconds taken to honk the horn at the car ahead after a stoplight turns green
Interpersonal attraction	<ul style="list-style-type: none">• Number of inches that an individual places his or her chair away from another person• Number of millimeters of pupil dilation when one person looks at another
Employee satisfaction	<ul style="list-style-type: none">• Number of days per month an employee shows up to work on time• Rating of job satisfaction from 1 (<i>not at all satisfied</i>) to 9 (<i>extremely satisfied</i>)
Decision-making skills	<ul style="list-style-type: none">• Number of groups able to correctly solve a group performance task• Number of seconds in which a person solves a problem
Depression	<ul style="list-style-type: none">• Number of negative words used in a creative story• Number of appointments made with a psychotherapist

6.

RESEARCH METHODS

Learning Objectives

By the end of this section, you will be able to:

- Describe the different research methods used by psychologists
- Discuss the strengths and weaknesses of case studies, naturalistic observation, surveys, and archival research
- Compare longitudinal and cross-sectional approaches to research

There are many research methods available to psychologists in their efforts to understand, describe, and explain behavior and the cognitive and biological processes that underlie it. Some methods rely on observational techniques. Other approaches involve interactions between the researcher and the individuals who are being studied—ranging from a series of simple questions to extensive, in-depth interviews—to well-controlled experiments.

Each of these research methods has unique strengths and weaknesses, and each method may only be appropriate for certain types of research questions. For example, studies that rely primarily on observation produce incredible amounts of information, but the ability to apply this information to the larger population is somewhat limited because of small sample sizes. Survey research, on the other hand, allows researchers to easily collect data from relatively large samples. While this allows for results to be generalized to the larger population more easily, the information that can be collected on any given survey is somewhat limited and subject to problems associated with any type of self-reported data. Some researchers conduct archival research by using existing records. While this can be a fairly inexpensive way to collect data that can provide insight into a number of research questions, researchers using this approach have no control over how or what kind of data was collected. All of the methods described thus far are correlational in nature. This means that researchers can speak to important relationships that might exist between two or more variables of interest. However, correlational data cannot be used to make claims about cause-and-effect relationships.

Correlational research can find a relationship between two variables, but the only way a researcher can claim that the relationship between the variables is cause and effect is to perform an experiment. In experimental research, there is a tremendous amount of control over variables of interest. While this is a powerful approach, experiments are often conducted in very artificial settings. This calls into question the validity of experimental findings with regard to how they would apply in real-world settings. In addition, many of the questions that psychologists would like to answer cannot be pursued through experimental research because of ethical concerns.

Clinical or Case Studies

In 2011, the *New York Times* published a feature story on Krista and Tatiana Hogan, Canadian twin girls. These particular twins are unique because Krista and Tatiana are conjoined twins, connected at the head. There is evidence that the two girls are connected in a part of the brain called the thalamus, which is a major sensory relay center. Most incoming sensory information is sent through the thalamus before reaching higher regions of the cerebral cortex for processing.

To learn more about Krista and Tatiana, watch this *CBC* video about their lives: [Inseparable – See Through Each Other's Eyes](#).

The implications of this potential connection mean that it might be possible for one twin to experience the sensations of the other twin. For instance, if Krista is watching a particularly funny television program, Tatiana might smile or laugh even if she is not watching the program. This particular possibility has piqued the interest of many neuroscientists who seek to understand how the brain uses sensory information.

These twins represent an enormous resource in the study of the brain, and since their condition is very rare, it is likely that as long as their family agrees, scientists will follow these girls very closely throughout their lives to gain as much information as possible (Dominus, 2011).

In observational research, scientists are conducting a clinical or case study when they focus on one person or just a few individuals. Indeed, some scientists spend their entire careers studying just 10–20 individuals. Why would they do this? Obviously, when they focus their attention on a very small number of people, they can gain a tremendous amount of insight into those cases. The richness of information that is collected in clinical or case studies is unmatched by any other single research method. This allows the researcher to have a very deep understanding of the individuals and the particular phenomenon being studied.

If clinical or case studies provide so much information, why are they not more frequent among researchers? As it turns out, the major benefit of this particular approach is also a weakness. As mentioned earlier, this

approach is often used when studying individuals who are interesting to researchers because they have a rare characteristic. Therefore, the individuals who serve as the focus of case studies are not like most other people. If scientists ultimately want to explain all behavior, focusing attention on such a special group of people can make it difficult to generalize any observations to the larger population as a whole. Generalizing refers to the ability to apply the findings of a particular research project to larger segments of society. Again, case studies provide enormous amounts of information, but since the cases are so specific, the potential to apply what's learned to the average person may be very limited.

Naturalistic Observation

If you want to understand how behavior occurs, one of the best ways to gain information is to simply observe the behavior in its natural context. However, people might change their behavior in unexpected ways if they know they are being observed. How do researchers obtain accurate information when people tend to hide their natural behavior? As an example, imagine that your professor asks everyone in your class to raise their hand if they always wash their hands after using the restroom. Chances are that almost everyone in the classroom will raise their hand, but do you think hand washing after every trip to the restroom is really that universal?

This is very similar to the phenomenon mentioned earlier in this chapter: many individuals do not feel comfortable answering a question honestly. But if we are committed to finding out the facts about hand washing, we have other options available to us.

Suppose we send a classmate into the restroom to actually watch whether everyone washes their hands after using the restroom. Will our observer blend into the restroom environment by wearing a white lab coat, sitting with a clipboard, and staring at the sinks? We want our researcher to be inconspicuous—perhaps standing at one of the sinks pretending to put in contact lenses while secretly recording the relevant information. This type of observational study is called naturalistic observation: observing behavior in its natural setting. To better understand peer exclusion, Suzanne Fanger collaborated with colleagues at the University of Texas to observe the behavior of preschool children on a playground. How did the observers remain inconspicuous over the duration of the study? They equipped a few of the children with wireless microphones (which the children quickly forgot about) and observed while taking notes from a distance. Also, the children in that particular preschool (a “laboratory preschool”) were accustomed to having observers on the playground (Fanger, Frankel, & Hazen, 2012).

It is critical that the observer be as unobtrusive and as inconspicuous as possible: when people know they are being watched, they are less likely to behave naturally. If you have any doubt about this, ask yourself how your driving behavior might differ in two situations: In the first situation, you are driving down a deserted highway during the middle of the day; in the second situation, you are being followed by a police car down the same deserted highway.



Seeing a police car behind you would probably affect your driving behavior. (credit: Michael Gil)

It should be pointed out that naturalistic observation is not limited to research involving humans. Indeed, some of the best-known examples of naturalistic observation involve researchers going into the field to observe various kinds of animals in their own environments. As with human studies, the researchers maintain their distance and avoid interfering with the animal subjects so as not to influence their natural behaviors. Scientists have used this technique to study social hierarchies and interactions among animals ranging from ground squirrels to gorillas. The information provided by these studies is invaluable in understanding how those animals organize socially and communicate with one another. The anthropologist Jane Goodall, for example, spent nearly five decades observing the behavior of chimpanzees in Africa. As an illustration of the types of concerns that a researcher might encounter in naturalistic observation, some scientists criticized Goodall for giving the chimps names instead of referring to them by numbers—using names was thought to undermine the emotional detachment required for the objectivity of the study (McKie, 2010).



(a)



(b)

(a) Jane Goodall made a career of conducting naturalistic observations of (b) chimpanzee behavior. (credit “Jane Goodall”: modification of work by Erik Hersman; “chimpanzee”: modification of work by “Afrika Force”/Flickr.com)

The greatest benefit of naturalistic observation is the validity, or accuracy, of information collected unobtrusively in a natural setting. Having individuals behave as they normally would in a given situation means that we have a higher degree of ecological validity, or realism, than we might achieve with other research approaches. Therefore, our ability to generalize the findings of the research to real-world situations is enhanced. If done correctly, we need not worry about people or animals modifying their behavior simply because they are being observed. Sometimes, people may assume that reality programs give us a glimpse into authentic human behavior. However, the principle of inconspicuous observation is violated as reality stars are followed by camera crews and are interviewed on camera for personal confessionals. Given that environment, we must doubt how natural and realistic their behaviors are.

The major downside of naturalistic observation is that they are often difficult to set up and control. In our restroom study, what if you stood in the restroom all day prepared to record people’s hand-washing behavior and no one came in? Or, what if you have been closely observing a troop of gorillas for weeks only to find that they migrated to a new place while you were sleeping in your tent? The benefit of realistic data comes at a cost. As a researcher, you have no control over when (or if) you have behavior to observe. In addition, this type of observational research often requires significant investments of time, money, and a good dose of luck.

Sometimes studies involve structured observation. In these cases, people are observed while engaging in set, specific tasks. An excellent example of structured observation comes from Strange Situation by Mary Ainsworth (you will read more about this in the chapter on lifespan development). The Strange Situation is a procedure used to evaluate attachment styles that exist between an infant and caregiver. In this scenario, caregivers bring their infants into a room filled with toys. The Strange Situation involves a number of phases, including a stranger coming into the room, the caregiver leaving the room, and the caregiver’s return to the room. The infant’s behavior is closely monitored at each phase, but it is the behavior of the infant upon being

reunited with the caregiver that is most telling in terms of characterizing the infant's attachment style with the caregiver.

Another potential problem in observational research is observer bias. Generally, people who act as observers are closely involved in the research project and may unconsciously skew their observations to fit their research goals or expectations. To protect against this type of bias, researchers should have clear criteria established for the types of behaviors recorded and how those behaviors should be classified. In addition, researchers often compare observations of the same event by multiple observers, in order to test inter-rater reliability: a measure of reliability that assesses the consistency of observations by different observers.

Surveys

Often, psychologists develop surveys as a means of gathering data. Surveys are lists of questions to be answered by research participants and can be delivered as paper-and-pencil questionnaires, administered electronically, or conducted verbally. Generally, the survey itself can be completed in a short time, and the ease of administering a survey makes it easy to collect data from a large number of people.

Surveys allow researchers to gather data from larger samples than may be afforded by other research methods. A sample is a subset of individuals selected from a population, which is the overall group of individuals that the researchers are interested in. Researchers study the sample and seek to generalize their findings to the population.

Dear Visitor,

Your opinion is important to us.

We would like to invite you to participate in a short survey to gather your opinions and feedback on your news consumption habits.

The survey will take approximately 10-15 minutes.
Simply click the "Yes" button below to launch the survey.

Would you like to participate?

The image shows two rectangular buttons with rounded corners and a blue border. The left button is light blue and contains the word "YES" in bold black capital letters. The right button is also light blue and contains the word "NO" in bold black capital letters. Both buttons have a subtle drop shadow.

Surveys can be administered in a number of ways, including electronically administered research, like the survey shown here. (credit: Robert Nyman)

There are both strengths and weaknesses to using surveys in comparison to case studies. By using surveys, we can collect information from a larger sample of people. A larger sample is better able to reflect the actual diversity of the population, thus allowing better generalizability. Therefore, if our sample is sufficiently large and diverse, we can assume that the data we collect from the survey can be generalized to the larger population with more certainty than the information collected through a case study. However, given the greater number of people involved, we are not able to collect the same depth of information on each person that would be collected in a case study.

Another potential weakness of surveys is something we touched on earlier in this chapter: People don't always give accurate responses. They may lie, misremember, or answer questions in a way that they think makes them look good. For example, people may report drinking less alcohol than is actually the case.

Any number of research questions can be answered through the use of surveys. One real-world example is the research conducted by Jenkins, Ruppel, Kizer, Yehl, and Griffin (2012) about the backlash against the US Arab-American community following the terrorist attacks of September 11, 2001. Jenkins and colleagues wanted to determine to what extent these negative attitudes toward Arab Americans still existed nearly a decade after the attacks occurred. In one study, 140 research participants filled out a survey with 10 questions, including questions asking directly about the participant's overt prejudicial attitudes toward people of various ethnicities. The survey also asked indirect questions about how likely the participant would be to interact with a person of a given ethnicity in a variety of settings (such as, "How likely do you think it is that you would introduce yourself to a person of Arab-American descent?"). The results of the research suggested that participants were unwilling to report prejudicial attitudes toward any ethnic group. However, there were significant differences between their pattern of responses to questions about social interaction with Arab-Americans compared to other ethnic groups: they indicated less willingness for social interaction with Arab-Americans compared to the other ethnic groups. This suggested that the participants harbored subtle forms of prejudice against Arab-Americans, despite their assertions that this was not the case (Jenkins et al., 2012).

Archival Research

Some researchers gain access to large amounts of data without interacting with a single research participant. Instead, they use existing records to answer various research questions. This type of research approach is known as **[pb_glossary id="132"]archival research****[/pb_glossary]**. Archival research relies on looking at past records or data sets to look for interesting patterns or relationships.

For example, a researcher might access the academic records of all individuals who enrolled in college within the past ten years and calculate how long it took them to complete their degrees, as well as course loads, grades, and extracurricular involvement. Archival research could provide important information about who is most likely to complete their education, and it could help identify important risk factors for struggling students.



(a)



(b)

A researcher doing archival research examines records, whether archived as a (a) hardcopy or (b) electronically. (credit “paper files”: modification of work by “Newtown graffiti”/Flickr; “computer”: modification of work by INPVIC Family/Flickr)

In comparing archival research to other research methods, there are several important distinctions. For one, the researcher employing archival research never directly interacts with research participants. Therefore, the investment of time and money to collect data is considerably less with archival research. Additionally, researchers have no control over what information was originally collected. Therefore, research questions have to be tailored so they can be answered within the structure of the existing data sets. There is also no guarantee of consistency between the records from one source to another, which might make comparing and contrasting different data sets problematic.

Longitudinal and Cross-Sectional Research

Sometimes we want to see how people change over time, as in studies of human development and lifespan. When we test the same group of individuals repeatedly over an extended period of time, we are conducting longitudinal research. Longitudinal research is a research design in which data-gathering is administered repeatedly over an extended period of time. For example, we may survey a group of individuals about their dietary habits at age 20, retest them a decade later at age 30, and then again at age 40.

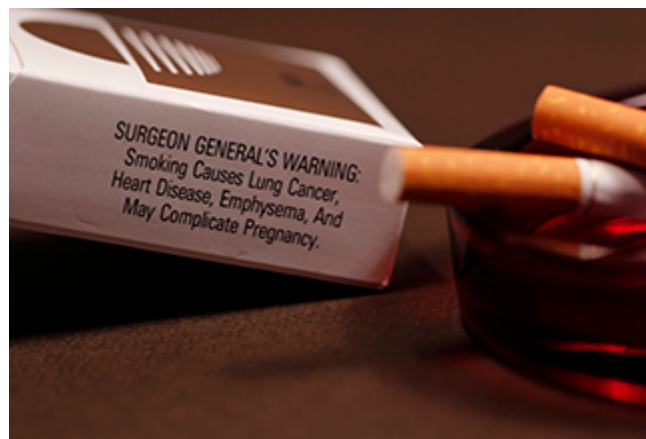
Another approach is cross-sectional research. In cross-sectional research, a researcher compares multiple segments of the population at the same time. Using the dietary habits example above, the researcher might directly compare different groups of people by age. Instead of following a group of people for 20 years to see how their dietary habits changed from decade to decade, the researcher would study a group of 20-year-old individuals and compare them to a group of 30-year-old individuals and a group of 40-year-old individuals. While cross-sectional research requires a shorter-term investment, it is also limited by differences that exist between the different generations (or cohorts) that have nothing to do with age, per se, but rather reflect

the social and cultural experiences of different generations of individuals that make them different from one another.

To illustrate this concept, consider the following survey findings. In recent years there has been significant growth in the popular support of same-sex marriage. Many studies on this topic break down survey participants into different age groups. In general, younger people are more supportive of same-sex marriage than those who are older (Jones, 2013). Does this mean that as we age we become less open to the idea of same-sex marriage, or does this mean that older individuals have different perspectives because of the social climates in which they grew up? Longitudinal research is a powerful approach because the same individuals are involved in the research project over time, which means that the researchers need to be less concerned with differences among cohorts affecting the results of their study.

Often longitudinal studies are employed when researching various diseases in an effort to understand particular risk factors. Such studies often involve tens of thousands of individuals who are followed for several decades. Given the enormous number of people involved in these studies, researchers can feel confident that their findings can be generalized to the larger population. The Cancer Prevention Study-3 (CPS-3) is one of a series of longitudinal studies sponsored by the American Cancer Society aimed at determining predictive risk factors associated with cancer. When participants enter the study, they complete a survey about their lives and family histories, providing information on factors that might cause or prevent the development of cancer. Then every few years the participants receive additional surveys to complete. In the end, hundreds of thousands of participants will be tracked over 20 years to determine which of them develop cancer and which do not.

Clearly, this type of research is important and potentially very informative. For instance, earlier longitudinal studies sponsored by the American Cancer Society provided some of the first scientific demonstrations of the now well-established links between increased rates of cancer and smoking (American Cancer Society, n.d.).



Longitudinal research like the CPS-3 helps us to better understand how smoking is associated with cancer and other diseases. (credit: CDC/Debra Cartagena)

As with any research strategy, longitudinal research is not without limitations. For one, these studies require

an incredible time investment by the researcher and research participants. Given that some longitudinal studies take years, if not decades, to complete, the results will not be known for a considerable period of time. In addition to the time demands, these studies also require a substantial financial investment. Many researchers are unable to commit the resources necessary to see a longitudinal project through to the end.

Research participants must also be willing to continue their participation for an extended period of time, and this can be problematic. People move, get married and take new names, get ill, and eventually die. Even without significant life changes, some people may simply choose to discontinue their participation in the project. As a result, the attrition rates, or reduction in the number of research participants due to dropouts, in longitudinal studies are quite high and increase over the course of a project. For this reason, researchers using this approach typically recruit many participants fully expecting that a substantial number will drop out before the end. As the study progresses, they continually check whether the sample still represents the larger population and make adjustments as necessary.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=59#h5p-3>

Summary

The clinical or case study involves studying just a few individuals for an extended period of time. While this approach provides an incredible depth of information, the ability to generalize these observations to the larger population is problematic. Naturalistic observation involves observing behavior in a natural setting and allows for the collection of valid, true-to-life information from realistic situations. However, naturalistic observation does not allow for much control and often requires quite a bit of time and money to perform. Researchers strive to ensure that their tools for collecting data are both reliable (consistent and replicable) and valid (accurate).

Surveys can be administered in a number of ways and make it possible to collect large amounts of data

quickly. However, the depth of information that can be collected through surveys is somewhat limited compared to a clinical or case study.

Archival research involves studying existing data sets to answer research questions.

Longitudinal research has been incredibly helpful to researchers who need to collect data on how people change over time. Cross-sectional research compares multiple segments of a population at a single time.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=59#h5p-4>

Critical Thinking Questions

In this section, conjoined twins, Krista and Tatiana, were described as being potential participants in a case study. In what other circumstances would you think that this particular research approach would be especially helpful and why?

Case studies might prove especially helpful using individuals who have rare conditions. For instance, if one wanted to study multiple personality disorder then the case study approach with individuals diagnosed with multiple personality disorder would be helpful.

Presumably, reality television programs aim to provide a realistic portrayal of the behavior displayed by the characters featured in such programs. This section pointed out why this is not really the case. What changes could be made in the way that these programs are produced that would result in more honest portrayals of realistic behavior?

The behavior displayed on these programs would be more realistic if the cameras were mounted in hidden locations, or if the people who appear on these programs did not know when they were being recorded.

Which of the research methods discussed in this section would be best suited to research the effectiveness of the D.A.R.E. program in preventing the use of alcohol and other drugs? Why? Longitudinal research would be an excellent approach in studying the effectiveness of this program because it would follow students as they aged to determine if their choices regarding alcohol and drugs were affected by their participation in the program.

Aside from biomedical research, what other areas of research could greatly benefit from both longitudinal and archival research?

Answers will vary. Possibilities include research on hiring practices based on human resource records, and research that follows former prisoners to determine if the time that they were incarcerated provided any sort of positive influence on their likelihood of engaging in criminal behavior in the future.

Personal Application Questions

A friend of yours is working part-time in a local pet store. Your friend has become increasingly interested in how dogs normally communicate and interact with each other, and is thinking of visiting a local veterinary clinic to see how dogs interact in the waiting room. After reading this section, do you think this is the best way to better understand such interactions? Do you have any suggestions that might result in more valid data?

As a college student, you are no doubt concerned about the grades that you earn while completing your coursework. If you wanted to know how overall GPA is related to success in life after college, how would you choose to approach this question and what kind of resources would you need to conduct this research?

7.

ETHICS

Learning Objectives

- Identify characteristics of an ethical research project using human participants and animals.
- Discuss the procedures that researchers use to ensure that their research with humans and with animals is ethical.

One of the questions that all scientists must address concerns the ethics of their research. Physicists are concerned about the potentially harmful outcomes of their experiments with nuclear materials. Biologists worry about the potential outcomes of creating genetically engineered human babies. Medical researchers agonize over the ethics of withholding potentially beneficial drugs from control groups in clinical trials. Likewise, psychologists are continually considering the ethics of their research.

Research in psychology may cause some stress, harm, or inconvenience for the people who participate in that research. For instance, researchers may require introductory psychology students to participate in research projects and then deceive these students, at least temporarily, about the nature of the research. Psychologists may induce stress, anxiety, or negative moods in their participants, expose them to weak electrical shocks, or convince them to behave in ways that violate their moral standards. And researchers may sometimes use animals in their research, potentially harming them in the process.

Decisions about whether research is ethical are made using established ethical codes developed by scientific organizations, such as the American Psychological Association, and federal governments. In the United States, the Department of Health and Human Services provides guidelines for ethical standards in research. Some research, such as the research conducted by the Nazis on prisoners during World War II, is perceived as immoral by almost everyone. Other procedures, such as the use of animals in research testing the effectiveness of drugs, are more controversial.

Scientific research has provided information that has improved the lives of many people. Therefore, it is unreasonable to argue that because scientific research has costs, no research should be conducted. This

argument fails to consider the fact that there are significant costs to *not* doing research and that these costs may be greater than the potential costs of conducting the research (Rosenthal, 1994). In each case, before beginning to conduct the research, scientists have attempted to determine the potential risks and benefits of the research and have come to the conclusion that the potential benefits of conducting the research outweigh the potential costs to the research participants.

CHARACTERISTICS OF AN ETHICAL RESEARCH PROJECT USING HUMAN PARTICIPANTS

- Trust and positive rapport are created between the researcher and the participant.
- The rights of both the experimenter and participant are considered, and the relationship between them is mutually beneficial.
- The experimenter treats the participant with concern and respect and attempts to make the research experience a pleasant and informative one.
- Before the research begins, the participant is given all information relevant to his or her decision to participate, including any possibilities of physical danger or psychological stress.
- The participant is given a chance to have questions about the procedure answered, thus guaranteeing his or her free choice about participating.
- After the experiment is over, any deception that has been used is made public, and the necessity for it is explained.
- The experimenter carefully debriefs the participant, explaining the underlying research hypothesis and the purpose of the experimental procedure in detail and answering any questions.
- The experimenter provides information about how he or she can be contacted and offers to provide information about the results of the research if the participant is interested in receiving it. (Stangor, 2011)

This list presents some of the most important factors that psychologists take into consideration when designing their research. The most direct ethical concern of the scientist is to *prevent harm* to the research

participants. One example is the well-known research of Stanley Milgram (1974) investigating obedience to authority. In these studies, participants were induced by an experimenter to administer electric shocks to another person so that Milgram could study the extent to which they would obey the demands of an authority figure. Most participants evidenced high levels of stress resulting from the psychological conflict they experienced between engaging in aggressive and dangerous behavior and following the instructions of the experimenter. Studies such as those by Milgram are no longer conducted because the scientific community is now much more sensitized to the potential of such procedures to create emotional discomfort or harm.

Another goal of ethical research is to guarantee that participants have *free choice* regarding whether they wish to participate in research. Students in psychology classes may be allowed, or even required, to participate in research, but they are also always given an option to choose a different study to be in, or to perform other activities instead. And once an experiment begins, the research participant is always free to leave the experiment if he or she wishes to. Concerns with free choice also occur in institutional settings, such as in schools, hospitals, corporations, and prisons, when individuals are required by the institutions to take certain tests, or when employees are told or asked to participate in research.

Researchers must also protect the *privacy* of the research participants. In some cases data can be kept anonymous by not having the respondents put any identifying information on their questionnaires. In other cases the data cannot be anonymous because the researcher needs to keep track of which respondent contributed the data. In this case one technique is to have each participant use a unique code number to identify his or her data, such as the last four digits of the student ID number. In this way the researcher can keep track of which person completed which questionnaire, but no one will be able to connect the data with the individual who contributed them.

Perhaps the most widespread ethical concern to the participants in behavioral research is the extent to which researchers employ deception. *Deception occurs whenever research participants are not completely and fully informed about the nature of the research project before participating in it.* Deception may occur in an active way, such as when the researcher tells the participants that he or she is studying learning when in fact the experiment really concerns obedience to authority. In other cases the deception is more passive, such as when participants are not told about the hypothesis being studied or the potential use of the data being collected.

Some researchers have argued that no deception should ever be used in any research (Baumrind, 1985). They argue that participants should always be told the complete truth about the nature of the research they are in and that when participants are deceived there will be negative consequences, such as the possibility that participants may arrive at other studies already expecting to be deceived. Other psychologists defend the use of deception on the grounds that it is needed to get participants to act naturally and to enable the study of psychological phenomena that might not otherwise be investigated. They argue that it would be impossible to study topics such as altruism, aggression, obedience, and stereotyping without using deception because if participants were informed ahead of time what the study involved, this knowledge would certainly change their behavior. The codes of ethics of the American Psychological Association and other organizations allow

researchers to use deception, but these codes also require them to explicitly consider how their research might be conducted without the use of deception.

ENSURING THAT RESEARCH IS ETHICAL

Making decisions about the ethics of research involves weighing the costs and benefits of conducting versus not conducting a given research project. The costs involve potential harm to the research participants and to the field, whereas the benefits include the potential for advancing knowledge about human behavior and offering various advantages, some educational, to the individual participants. Most generally, the ethics of a given research project are determined through a *cost-benefit analysis*, in which the costs are compared to the benefits. If the potential costs of the research appear to outweigh any potential benefits that might come from it, then the research should not proceed.

Arriving at a cost-benefit ratio is not simple. For one thing, there is no way to know ahead of time what the effects of a given procedure will be on every person or animal who participates or what benefit to society the research is likely to produce. In addition, what is ethical is defined by the current state of thinking within society, and thus perceived costs and benefits change over time. The U.S. Department of Health and Human Services regulations require that all universities receiving funds from the department set up an *Institutional Review Board (IRB)* to determine whether proposed research meets department regulations. The Institutional Review Board (IRB) is a committee of at least five members whose goal it is to determine the cost-benefit ratio of research conducted within an institution. The IRB approves the procedures of all the research conducted at the institution before the research can begin. The board may suggest modifications to the procedures, or (in rare cases) it may inform the scientist that the research violates Department of Health and Human Services guidelines and thus cannot be conducted at all.

One important tool for ensuring that research is ethical is the use of *informed consent*. A sample informed consent form is shown in [Figure 2.2 “Sample Consent Form.”](#) Informed consent, conducted before a participant begins a research session, is designed to explain the research procedures and inform the participant of his or her rights during the investigation. The informed consent explains as much as possible about the true nature of the study, particularly everything that might be expected to influence willingness to participate, but it may in some cases withhold some information that allows the study to work.

Consent Form: Interactions

I state that I am 18 years of age or older and wish to participate in a program of research being conducted by Dr. Charles Stangor at the University of Maryland, College Park, Department of Psychology.

The purpose of the research is to study how individuals get to know each other. In the remainder of the study I will be having a short conversation with another person. This interaction will be videotaped. At the end of the interaction, I will be asked to complete some questionnaires about how I felt during and what I remember about the interaction. The entire experiment will take about 45 minutes.

I furthermore consent to allow the videotape that has been made of me and my partner to be used in the research. I understand that the videotape will be used for research purposes only, and no one else except the present experimenter and one other person who will help code the tape will ever view it.

I understand that code numbers will be used to identify the videotapes and that all written material that I contribute will be kept separate from the videos. As a result, it will not be possible to connect my name to my videotape.

I understand that both my partner and I have the right to withdraw the tape from the study at any point.

I understand that the experiment is not designed to help me personally but that the researchers hope to learn more about interpersonal interactions.

I understand that I am free to ask questions or to withdraw from participation at any time without penalty.

Dr. Charles Stangor
Department of Psychology
Room 3123
555-5921

Signature of participant

Date

Figure 2.2 Sample Consent Form. The informed consent form explains the research procedures and informs the participant of his or her rights during the investigation. Adapted from Stangor, C. (2011). *Research methods for the behavioral sciences* (4th ed.). Mountain View, CA: Cengage.

Because participating in research has the potential to produce long-term changes in the research participants, all participants should be fully debriefed immediately after their participation. The debriefing is a *procedure designed to fully explain the purposes and procedures of the research and remove any harmful aftereffects of participation*.

RESEARCH WITH ANIMALS

Because animals make up an important part of the natural world, and because some research cannot be conducted using humans, animals are also participants in psychological research. Most psychological research using animals is now conducted with rats, mice, and birds, and the use of other animals in research is declining (Thomas & Blackman, 1992). As with ethical decisions involving human participants, a set of basic principles has been developed that helps researchers make informed decisions about such research; a summary is shown below.

APA GUIDELINES ON HUMANE CARE AND USE OF ANIMALS IN RESEARCH

The following are some of the most important ethical principles from the American Psychological Association's guidelines on research with animals.

- Psychologists acquire, care for, use, and dispose of animals in compliance with current federal, state, and local laws and regulations, and with professional standards.
- Psychologists trained in research methods and experienced in the care of laboratory animals supervise all procedures involving animals and are responsible for ensuring appropriate consideration of their comfort, health, and humane treatment.
- Psychologists ensure that all individuals under their supervision who are using animals have received instruction in research methods and in the care, maintenance, and handling of the species being used, to the extent appropriate to their role.
- Psychologists make reasonable efforts to minimize the discomfort, infection, illness, and pain of animal subjects.
- Psychologists use a procedure subjecting animals to pain, stress, or privation only when an alternative procedure is unavailable and the goal is justified by its prospective scientific, educational, or applied value.
- Psychologists perform surgical procedures under appropriate anesthesia and follow techniques to avoid infection and minimize pain during and after surgery.
- When it is appropriate that an animal's life be terminated, psychologists proceed rapidly, with an effort to minimize pain and in accordance with accepted procedures. (American Psychological Association, 2002)



Psychologists may use animals in their research, but they make reasonable efforts to minimize the discomfort the animals experience. Understanding Animal Research – Rabbit in Research for Animal Testing – CC BY 2.0.

Because the use of animals in research involves a personal value, people naturally disagree about this practice. Although many people accept the value of such research (Plous, 1996), a minority of people, including animal-rights activists, believes that it is ethically wrong to conduct research on animals. This argument is based on the assumption that because animals are living creatures just as humans are, no harm should ever be done to them.

Most scientists, however, reject this view. They argue that such beliefs ignore the potential benefits that have and continue to come from research with animals. For instance, drugs that can reduce the incidence of cancer or AIDS may first be tested on animals, and surgery that can save human lives may first be practiced on animals. Research on animals has also led to a better understanding of the physiological causes of depression, phobias, and stress, among other illnesses. In contrast to animal-rights activists, then, scientists believe that because there are many benefits that accrue from animal research, such research can and should continue as long as the humane treatment of the animals used in the research is guaranteed.

Key Takeaways

- Psychologists use the scientific method to generate, accumulate, and report scientific knowledge.
- Basic research, which answers questions about behavior, and applied research, which finds solutions to everyday problems, inform each other and work together to advance science.

- Research reports describing scientific studies are published in scientific journals so that other scientists and laypersons may review the empirical findings.
- Organizing principles, including laws, theories, and research hypotheses, give structure and uniformity to scientific methods.
- Concerns for conducting ethical research are paramount. Researchers assure that participants are given free choice to participate and that their privacy is protected. Informed consent and debriefing help provide humane treatment of participants.
- A cost-benefit analysis is used to determine what research should and should not be allowed to proceed.

Exercises and Critical Thinking

1. Give an example from personal experience of how you have or how someone you know has benefited from the results of scientific research.
2. Find and discuss a research project that in your opinion has ethical concerns. Explain why you find these concerns to be troubling.
3. Indicate your personal feelings about the use of animals in research. When should and should not animals be used? What principles have you used to come to these conclusions?

8.

REFERENCES

American Academy of Pediatrics, American Academy of Child & Adolescent Psychiatry, American Psychological Association, American Medical Association, American Academy of Family Physicians, American Psychiatric Association. (2000). *Joint statement on the impact of entertainment violence on children*. Retrieved from <http://www2.aap.org/advocacy/releases/jstmtevc.htm>

American Cancer Society. (n.d.). History of the cancer prevention studies. Retrieved from <http://www.cancer.org/research/researchtopreventcancer/history-cancer-prevention-study>

American Psychological Association. (2009). *Publication Manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

American Psychological Association. (n.d.). *Research with animals in psychology*. Retrieved from <https://www.apa.org/research/responsible/research-animals.pdf>

Arnett, J. (2008). The neglected 95%: Why American psychology needs to become less American. *American Psychologist*, 63(7), 602–614.

Barton, B. A., Eldridge, A. L., Thompson, D., Affenito, S. G., Striegel-Moore, R. H., Franko, D. L., . . . Crockett, S. J. (2005). The relationship of breakfast and cereal consumption to nutrient intake and body mass index: The national heart, lung, and blood institute growth and health study. *Journal of the American Dietetic Association*, 105(9), 1383–1389. Retrieved from <http://dx.doi.org/10.1016/j.jada.2005.06.003>

Chwalisz, K., Diener, E., & Gallagher, D. (1988). Autonomic arousal feedback and emotional experience: Evidence from the spinal cord injured. *Journal of Personality and Social Psychology*, 54, 820–828.

Clayton, R. R., Cattarello, A. M., & Johnstone, B. M. (1996). The effectiveness of Drug Abuse Resistance Education (Project DARE): 5-year follow-up results. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, 25(3), 307–318. doi:10.1006/pmed.1996.0061

D.A.R.E. (n.d.). D.A.R.E. is substance abuse prevention education and much more! About page. Retrieved from <http://www.dare.org/about-d-a-r-e/>

Dominus, S. (2011, May 25). Could conjoined twins share a mind? *New York Times Sunday Magazine*. Retrieved from http://www.nytimes.com/2011/05/29/magazine/could-conjoined-twins-share-a-mind.html?_r=5&hp&

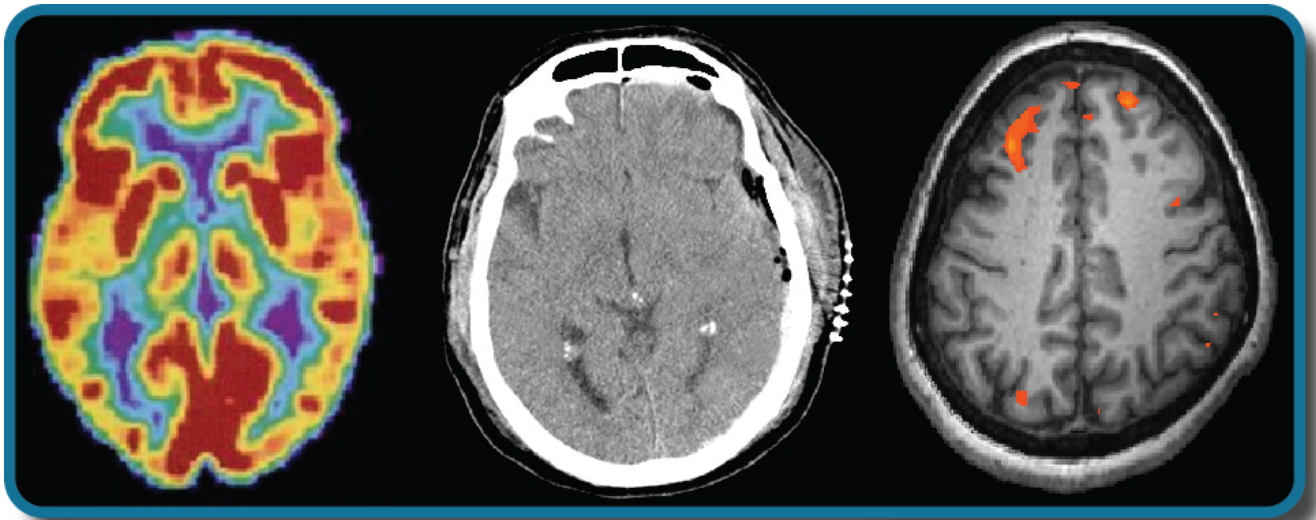
Ennett, S. T., Tobler, N. S., Ringwalt, C. L., & Flewelling, R. L. (1994). How effective is drug abuse resistance education? A meta-analysis of Project DARE outcome evaluations. *American Journal of Public Health*, 84(9), 1394–1401. doi:10.2105/AJPH.84.9.1394

- Fanger, S. M., Frankel, L. A., & Hazen, N. (2012). Peer exclusion in preschool children's play: Naturalistic observations in a playground setting. *Merrill-Palmer Quarterly*, 58, 224–254.
- Fiedler, K. (2004). Illusory correlation. In R. F. Pohl (Ed.), *Cognitive illusions: A handbook on fallacies and biases in thinking, judgment and memory* (pp. 97–114). New York, NY: Psychology Press.
- Frantzen, L. B., Treviño, R. P., Echon, R. M., Garcia-Dominic, O., & DiMarco, N. (2013). Association between frequency of ready-to-eat cereal consumption, nutrient intakes, and body mass index in fourth- to sixth-grade low-income minority children. *Journal of the Academy of Nutrition and Dietetics*, 113(4), 511–519.
- Harper, J. (2013, July 5). Ice cream and crime: Where cold cuisine and hot disputes intersect. *The Times-Picayune*. Retrieved from http://www.nola.com/crime/index.ssf/2013/07/ice_cream_and_crime_where_hot.html
- Jenkins, W. J., Ruppel, S. E., Kizer, J. B., Yehl, J. L., & Griffin, J. L. (2012). An examination of post 9-11 attitudes towards Arab Americans. *North American Journal of Psychology*, 14, 77–84.
- Jones, J. M. (2013, May 13). Same-sex marriage support solidifies above 50% in U.S. *Gallup Politics*. Retrieved from <http://www.gallup.com/poll/162398/sex-marriage-support-solidifies-above.aspx>
- Kobrin, J. L., Patterson, B. F., Shaw, E. J., Mattern, K. D., & Barbuti, S. M. (2008). *Validity of the SAT for predicting first-year college grade point average* (Research Report No. 2008-5). Retrieved from <https://research.collegeboard.org/sites/default/files/publications/2012/7/researchreport-2008-5-validity-sat-predicting-first-year-college-grade-point-average.pdf>
- Lewin, T. (2014, March 5). A new SAT aims to realign with schoolwork. *New York Times*. Retrieved from <http://www.nytimes.com/2014/03/06/education/major-changes-in-sat-announced-by-college-board.html>
- Lowcock, E. C., Cotterchio, M., Anderson, L. N., Boucher, B. A., & El-Sohemy, A. (2013). High coffee intake, but not caffeine, is associated with reduced estrogen receptor negative and postmenopausal breast cancer risk with no effect modification by CYP1A2 genotype. *Nutrition and Cancer*, 65(3), 398–409. doi:10.1080/01635581.2013.768348
- Lowry, M., Dean, K., & Manders, K. (2010). The link between sleep quantity and academic performance for the college student. *Sentience: The University of Minnesota Undergraduate Journal of Psychology*, 3(Spring), 16–19. Retrieved from http://www.psych.umn.edu/sentience/files/SENTIENCE_Vol3.pdf
- Lynam, D. R., Milich, R., Zimmerman, R., Novak, S. P., Logan, T. K., Martin, C., . . . Clayton, R. (1999). Project DARE: No effects at 10-year follow-up. *Journal of Consulting and Clinical Psychology*, 67(4), 590–593. doi:10.1037/0022-006X.67.4.590
- McKie, R. (2010, June 26). Chimps with everything: Jane Goodall's 50 years in the jungle. *The Guardian*. Retrieved from <http://www.theguardian.com/science/2010/jun/27/jane-goodall-chimps-africa-interview>
- Offit, P. (2008). *Autism's false prophets: Bad science, risky medicine, and the search for a cure*. New York: Columbia University Press.
- Perkins, H. W., Haines, M. P., & Rice, R. (2005). Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *J. Stud. Alcohol*, 66(4), 470–478.

- Rimer, S. (2008, September 21). College panel calls for less focus on SATs. *The New York Times*. Retrieved from http://www.nytimes.com/2008/09/22/education/22admissions.html?_r=0
- Ringwalt, C., Ennett, S. T., & Holt, K. D. (1991). An outcome evaluation of Project DARE (Drug Abuse Resistance Education). *Health Education Research*, 6(3), 327–337. doi:10.1093/her/6.3.327
- Rothstein, J. M. (2004). College performance predictions and the SAT. *Journal of Econometrics*, 121, 297–317.
- Rotton, J., & Kelly, I. W. (1985). Much ado about the full moon: A meta-analysis of lunar-lunacy research. *Psychological Bulletin*, 97(2), 286–306. doi:10.1037/0033-2909.97.2.286
- Santelices, M. V., & Wilson, M. (2010). Unfair treatment? The case of Freedle, the SAT, and the standardization approach to differential item functioning. *Harvard Education Review*, 80, 106–134.
- Sears, D. O. (1986). College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *Journal of Personality and Social Psychology*, 51, 515–530.
- Tuskegee University. (n.d.). *About the USPHS Syphilis Study*. Retrieved from http://www.tuskegee.edu/about_us/centers_of_excellence/bioethics_center/about_the_usphs_syphilis_study.aspx

PART III

PHYSIOLOGICAL ASPECTS OF PSYCHOLOGY



Different brain imaging techniques provide scientists with insight into different aspects of how the human brain functions. Left to right, PET scan (positron emission tomography), CT scan (computed tomography), and fMRI (functional magnetic resonance imaging) are three types of scans. (credit “left”: modification of work by Health and Human Services Department, National Institutes of Health; credit “center”: modification of work by “Aceofhearts1968”/Wikimedia Commons; credit “right”: modification of work by Kim J, Matthews NL, Park S.)

Have you ever taken a device apart to find out how it works? Many of us have done so, whether to attempt a repair or simply to satisfy our curiosity. A device’s internal workings are often distinct from its user interface on the outside. For example, we don’t think about microchips and circuits when we turn up the volume on a mobile phone; instead, we think about getting the volume just right. Similarly, the inner workings of the human body are often distinct from the external expression of those workings. It is the job of psychologists to find the connection between these—for example, to figure out how the firings of millions of neurons become a thought.

This chapter strives to explain the biological mechanisms that underlie behavior. These physiological and anatomical foundations are the basis for many areas of psychology. In this chapter, you will learn how genetics influence both physiological and psychological traits. You will become familiar with the structure and function of the nervous system. And, finally, you will learn how the nervous system interacts with the endocrine system.

9.

HUMAN GENETICS

Learning Objectives

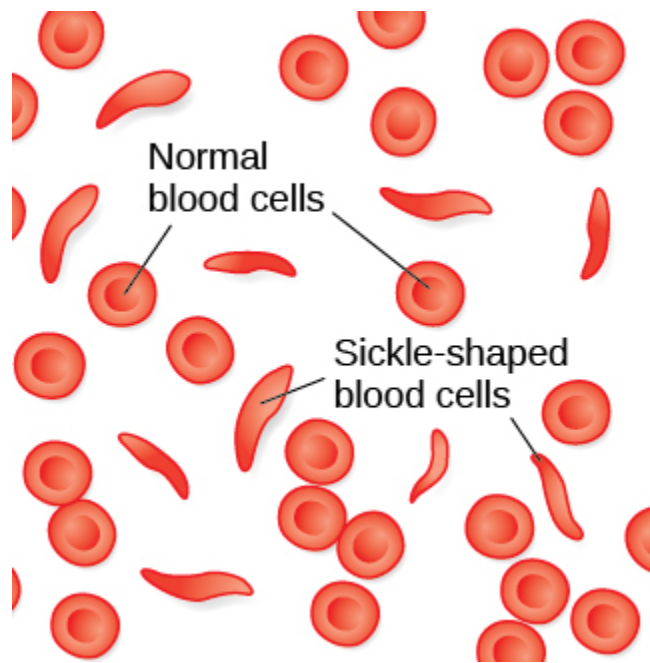
By the end of this section, you will be able to:

- Explain the basic principles of the theory of evolution by natural selection
- Describe the differences between genotype and phenotype
- Discuss how gene-environment interactions are critical for the expression of physical and psychological characteristics

Psychological researchers study genetics in order to better understand the biological basis that contributes to certain behaviors. While all humans share certain biological mechanisms, we are each unique. And while our bodies have many of the same parts—brains and hormones and cells with genetic codes—these are expressed in a wide variety of behaviors, thoughts, and reactions.

Why do two people infected by the same disease have different outcomes: one surviving and one succumbing to the ailment? How are genetic diseases passed through family lines? Are there genetic components to psychological disorders, such as depression or schizophrenia? To what extent might there be a psychological basis for health conditions such as childhood obesity?

To explore these questions, let's start by focusing on a specific disease, sickle-cell anemia, and how it might affect two infected sisters. Sickle-cell anemia is a genetic condition in which red blood cells, which are normally round, take on a crescent-like shape. The changed shape of these cells affects how they function: sickle-shaped cells can clog blood vessels and block blood flow, leading to high fever, severe pain, swelling, and tissue damage.



Normal blood cells travel freely through the blood vessels, while sickle-shaped cells form blockages preventing blood flow.

Many people with sickle-cell anemia—and the particular genetic **mutation** (*sudden, permanent change in a gene*) that causes it—die at an early age. While the notion of “survival of the fittest” may suggest that people suffering from this disease have a low survival rate and therefore the disease will become less common, this is not the case. Despite the negative evolutionary effects associated with this genetic mutation, the sickle-cell gene remains relatively common among people of African descent. Why is this? The explanation is illustrated with the following scenario.

Imagine two young women—Luwi and Sena—sisters in rural Zambia, Africa. Luwi carries the gene for sickle-cell anemia; Sena does not carry the gene. Sickle-cell carriers have one copy of the sickle-cell gene but do not have full-blown sickle-cell anemia. They experience symptoms only if they are severely dehydrated or are deprived of oxygen (as in mountain climbing). Carriers are thought to be immune from malaria (an often deadly disease that is widespread in tropical climates) because changes in their blood chemistry and immune functioning prevent the malaria parasite from having its effects (Gong, Parikh, Rosenthal, & Greenhouse, 2013). However, full-blown sickle-cell anemia, with two copies of the sickle-cell gene, does not provide immunity to malaria.

While walking home from school, both sisters are bitten by mosquitos carrying the malaria parasite. Luwi does not get malaria because she carries the sickle-cell mutation. Sena, on the other hand, develops malaria and dies just two weeks later. Luwi survives and eventually has children, to whom she may pass on the sickle-cell mutation.

Visit this website to learn more about how a mutation in DNA leads to sickle-cell anemia:

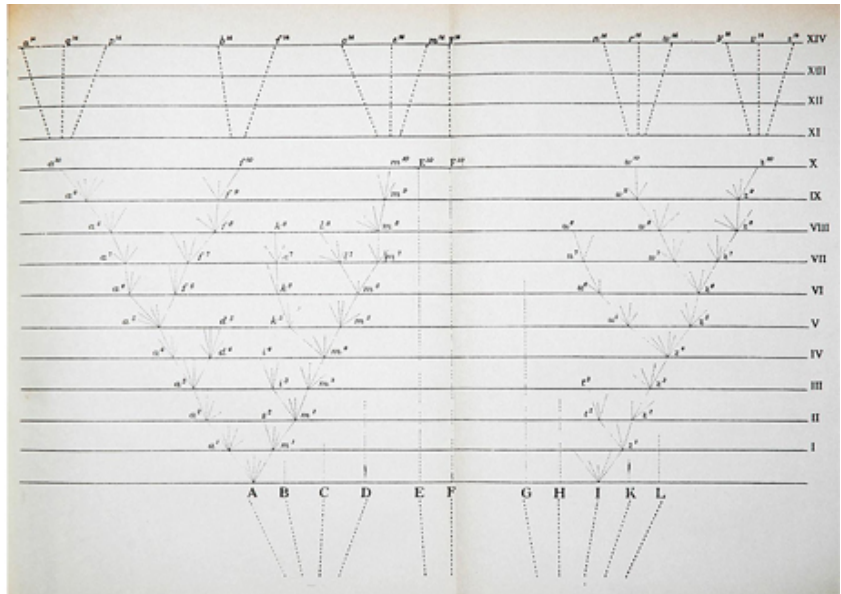
[Biology & 3D Animation Library – Sickle Cell](#),

Malaria is rare in the United States, so the sickle-cell gene benefits nobody: the gene manifests primarily in health problems—minor in carriers, severe in the full-blown disease—with no health benefits for carriers. However, the situation is quite different in other parts of the world. In parts of Africa where malaria is prevalent, having the sickle-cell mutation does provide health benefits for carriers (protection from malaria).

This is precisely the situation that Charles Darwin describes in the **theory of evolution by natural selection**. In simple terms, *the theory states that organisms that are better suited for their environment will survive and reproduce, while those that are poorly suited for their environment will die off*. In our example, we can see that as a carrier, Luwi's mutation is highly adaptive in her African homeland; however, if she resided in the United States (where malaria is much less common), her mutation could prove costly—with a high probability of the disease in her descendants and minor health problems of her own.



(a)



(b)

(a) In 1859, Charles Darwin proposed his theory of evolution by natural selection in his book, *On the Origin of Species*. (b) The book contains just one illustration: this diagram that shows how species evolve over time through natural selection.

TWO PERSPECTIVES ON GENETICS AND BEHAVIOR

It's easy to get confused about two fields that study the interaction of genes and the environment, such as the fields of evolutionary psychology and behavioral genetics. How can we tell them apart?

In both fields, it is understood that **genes** (*sequence of DNA that controls or partially controls physical characteristics*) not only code for particular traits but also contribute to certain patterns of cognition and behavior. Evolutionary psychology focuses on how universal patterns of behavior and cognitive processes have evolved over time. Therefore, variations in cognition and behavior would make individuals more or less successful in reproducing and passing those genes to their offspring. Evolutionary psychologists study a variety of psychological phenomena that may have evolved as adaptations, including fear response, food preferences, mate selection, and cooperative behaviors (Confer et al., 2010).

Whereas evolutionary psychologists focus on universal patterns that evolved over millions of years, behavioral geneticists study how individual differences arise, in the present, through the interaction of genes and the environment. When studying human behavior, behavioral geneticists often employ twin and adoption studies to research questions of interest. Twin studies compare the rates that a given behavioral trait is shared among **identical twins** (*twins that develop from the same sperm and egg*) and **fraternal twins** (*twins who develop from two different eggs fertilized by different sperm, so their genetic material varies the same as in non-twin siblings*); adoption studies compare those rates among biologically related relatives and adopted relatives. Both approaches provide some insight into the relative importance of genes and environment for the expression of a given trait.

Watch this interview with renowned evolutionary psychologist Davis Buss for an explanation of how a psychologist approaches evolution and how this approach fits within the field of social science: [In the Expert's Chair with Dr. David Buss](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=163#oembed-1>

Genetic Variation

Genetic variation, the genetic difference between individuals, is what contributes to a species' adaptation to its environment. In humans, genetic variation begins with an egg, about 100 million sperm, and fertilization. Fertile women ovulate roughly once per month, releasing an egg from follicles in the ovary. During the egg's journey from the ovary through the fallopian tubes, to the uterus, a sperm may fertilize an egg.

The egg and the sperm each contain 23 chromosomes. **Chromosomes** are *long strings of genetic material known as deoxyribonucleic acid (DNA)*. **DNA** is a *helix-shaped molecule made up of nucleotide base pairs*. In each chromosome, sequences of DNA make up genes that control or partially control a number of visible characteristics, known as traits, such as eye color, hair color, and so on. A single gene may have multiple possible variations, or alleles. An **allele** is a *specific version of a gene*. So, a given gene may code for the trait of hair color, and the different alleles of that gene affect which hair color an individual has.

When a sperm and egg fuse, their 23 chromosomes pair up and create a zygote with 23 pairs of chromosomes. Therefore, each parent contributes half the genetic information carried by the offspring; the resulting physical characteristics of the offspring (called the phenotype) are determined by the interaction of genetic material supplied by the parents (called the genotype). A person's **genotype** is *the genetic makeup of that individual*. **Phenotype**, on the other hand, *refers to the individual's inherited physical characteristics, which are a combination of genetic and environmental influences*.



(a)



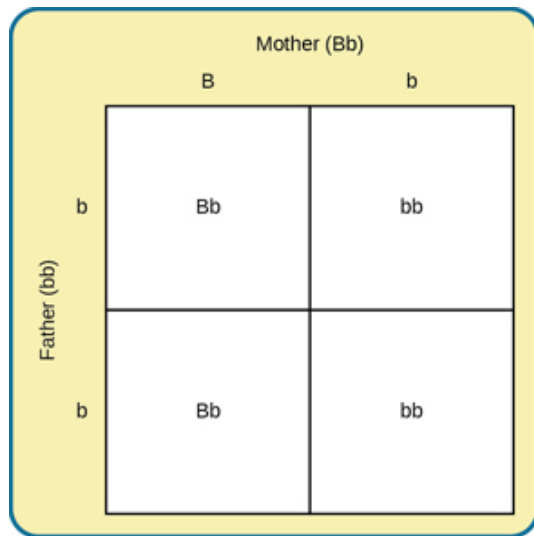
(b)

(a) Genotype refers to the genetic makeup of an individual based on the genetic material (DNA) inherited from one's parents. (b) Phenotype describes an individual's observable characteristics, such as hair color, skin color, height, and build. (credit a: modification of work by Caroline Davis; credit b: modification of work by Cory Zanker)

Most traits are controlled by multiple genes, but some traits are controlled by one gene. A characteristic like cleft chin, for example, is influenced by a single gene from each parent. In this example, we will call the gene for cleft chin "B," and the gene for smooth chin "b." Cleft chin is a dominant trait, which means that having the **dominant allele** (*an allele whose phenotype will be expressed in an individual that possesses that allele*) either

from one parent (Bb) or both parents (BB) will always result in the phenotype associated with the dominant allele. When someone has two copies of the same allele, they are said to be homozygous for that allele. When someone has a combination of alleles for a given gene, they are said to be **heterozygous** (*consisting of two different alleles*). For example, a smooth chin is a recessive trait, which means that an individual will only display the smooth chin phenotype if they are homozygous for that **recessive allele** (*allele whose phenotype will be expressed only if an individual is homozygous for that allele*) (bb).

Imagine that a woman with a cleft chin mates with a man with a smooth chin. What type of chin will their child have? The answer to that depends on which alleles each parent carries. If the woman is homozygous for cleft chin (BB), her offspring will always have a cleft chin. It gets a little more complicated, however, if the mother is heterozygous for this gene (Bb). Since the father has a smooth chin—therefore homozygous for the recessive allele (bb)—we can expect the offspring to have a 50% chance of having a cleft chin and a 50% chance of having a smooth chin.



(a)



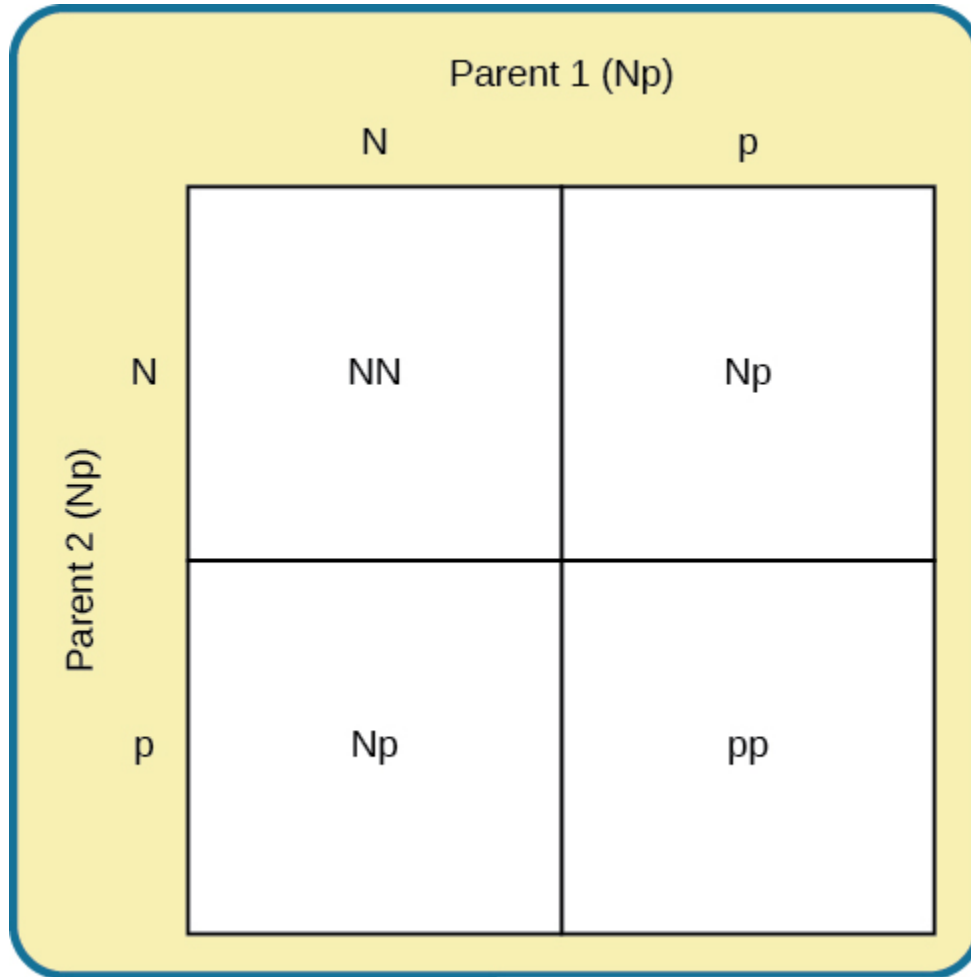
(b)

(a) A Punnett square is a tool used to predict how genes will interact in the production of offspring. The capital B represents the dominant allele, and the lowercase b represents the recessive allele. In the example of the cleft chin, where B is cleft chin (dominant allele), wherever a pair contains the dominant allele, B, you can expect a cleft chin phenotype. You can expect a smooth chin phenotype only when there are two copies of the recessive allele, bb. (b) A cleft chin, shown here, is an inherited trait.

Sickle-cell anemia is just one of many genetic disorders caused by the pairing of two recessive genes. For example, phenylketonuria (PKU) is a condition in which individuals lack an enzyme that normally converts harmful amino acids into harmless byproducts. If someone with this condition goes untreated, he or she will experience significant deficits in cognitive function, seizures, and an increased risk of various psychiatric disorders. Because PKU is a recessive trait, each parent must have at least one copy of the recessive allele in order to produce a child with the condition.

So far, we have discussed traits that involve just one gene, but few human characteristics are controlled by a

single gene. Most traits are **polygenic** (*multiple genes affecting a given trait*): controlled by more than one gene. Height is one example of a polygenic trait, as are skin color and weight.



In this Punnett square, N represents the normal allele, and p represents the recessive allele that is associated with PKU. If two individuals mate who are both heterozygous for the allele associated with PKU, their offspring have a 25% chance of expressing the PKU phenotype.

Where do harmful genes that contribute to diseases like PKU come from? Gene mutations provide one source of harmful genes. A mutation is a sudden, permanent change in a gene. While many mutations can be harmful or lethal, once in a while, a mutation benefits an individual by giving that person an advantage over those who do not have the mutation. Recall that the theory of evolution asserts that individuals best adapted to their particular environments are more likely to reproduce and pass on their genes to future generations. In order for this process to occur, there must be competition—more technically, there must be variability in genes (and resultant traits) that allow for variation in adaptability to the environment. If a population consisted of identical individuals, then any dramatic changes in the environment would affect everyone in the same way, and there would be no variation in selection. In contrast, diversity in genes and associated traits allows

some individuals to perform slightly better than others when faced with environmental change. This creates a distinct advantage for individuals best suited for their environments in terms of successful reproduction and genetic transmission.

Gene-Environment Interactions

Genes do not exist in a vacuum. Although we are all biological organisms, we also exist in an environment that is incredibly important in determining not only when and how our genes express themselves, but also in what combination. Each of us represents a unique interaction between our genetic makeup and our environment; range of reaction is one way to describe this interaction. **Range of reaction** *asserts that our genes set the boundaries within which we can operate, and our environment interacts with the genes to determine where in that range we will fall.* For example, if an individual's genetic makeup predisposes her to high levels of intellectual potential and she is reared in a rich, stimulating environment, then she will be more likely to achieve her full potential than if she were raised under conditions of significant deprivation. According to the concept of range of reaction, genes set definite limits on potential, and environment determines how much of that potential is achieved. Some disagree with this theory and argue that genes do not set a limit on a person's potential.

Another perspective on the interaction between genes and the environment is the concept of **genetic environmental correlation** (*view of gene-environment interaction that asserts our genes affect our environment, and our environment influences the expression of our genes*). Stated simply, our genes influence our environment, and our environment influences the expression of our genes. Not only do our genes and environment interact, as in range of reaction, but they also influence one another bidirectionally. For example, the child of an NBA player would probably be exposed to basketball from an early age. Such exposure might allow the child to realize his or her full genetic, athletic potential. Thus, the parents' genes, which the child shares, influence the child's environment, and that environment, in turn, is well suited to support the child's genetic potential.



Nature and nurture work together like complex pieces of a human puzzle. The interaction of our environment and genes makes us the individuals we are. (credit “puzzle”: modification of work by Cory Zanker; credit “houses”: modification of work by Ben Salter; credit “DNA”: modification of work by NHGRI)

In another approach to gene-environment interactions, the field of **epigenetics** (*study of gene-environment interactions, such as how the same genotype leads to different phenotypes*) looks beyond the genotype itself and studies how the same genotype can be expressed in different ways. In other words, researchers study how the same genotype can lead to very different phenotypes. As mentioned earlier, gene expression is often influenced by environmental context in ways that are not entirely obvious. For instance, identical twins share the same genetic information (identical twins develop from a single fertilized egg that split, so the genetic material is exactly the same in each; in contrast, fraternal twins develop from two different eggs fertilized by different sperm, so the genetic material varies as with non-twin siblings). But even with identical genes, there remains an incredible amount of variability in how gene expression can unfold over the course of each twin’s life. Sometimes, one twin will develop a disease and the other will not. In one example, Tiffany, an identical twin, died from cancer at age 7, but her twin, now 19 years old, has never had cancer. Although these individuals share an identical genotype, their phenotypes differ as a result of how that genetic information is expressed over time. The epigenetic perspective is very different from range of reaction, because here the genotype is not fixed and limited.

Visit this site for an engaging video primer on the epigenetics of twin studies: [Insights From Identical Twins](#).

Genes affect more than our physical characteristics. Indeed, scientists have found genetic linkages to a number of behavioral characteristics, ranging from basic personality traits to sexual orientation to spirituality (for examples, see Mustanski et al., 2005; Comings, Gonzales, Saucier, Johnson, & MacMurray, 2000). Genes are also associated with temperament and a number of psychological disorders, such as depression and schizophrenia. So while it is true that genes provide the biological blueprints for our cells, tissues, organs, and body, they also have a significant impact on our experiences and our behaviors.

Let's look at the following findings regarding schizophrenia in light of our three views of gene-environment interactions. Which view do you think best explains this evidence?

In a study of people who were given up for adoption, adoptees whose biological mothers had schizophrenia *and* who had been raised in a disturbed family environment were much more likely to develop schizophrenia or another psychotic disorder than were any of the other groups in the study:

- Of adoptees whose biological mothers had schizophrenia (high genetic risk) and who were raised in disturbed family environments, 36.8% were likely to develop schizophrenia.
- Of adoptees whose biological mothers had schizophrenia (high genetic risk) and who were raised in healthy family environments, 5.8% were likely to develop schizophrenia.
- Of adoptees with a low genetic risk (whose mothers did not have schizophrenia) and who were raised in disturbed family environments, 5.3% were likely to develop schizophrenia.
- Of adoptees with a low genetic risk (whose mothers did not have schizophrenia) and who were raised in healthy family environments, 4.8% were likely to develop schizophrenia (Tienari et al., 2004).

The study shows that adoptees with high genetic risk were especially likely to develop schizophrenia only if they were raised in disturbed home environments. This research lends credibility to the notion that both genetic vulnerability and environmental stress are necessary for schizophrenia to develop, and that genes alone do not tell the full tale.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=163#h5p-34>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=163#h5p-35>

Critical Thinking Questions

The theory of evolution by natural selection requires variability of a given trait. Why is variability necessary and where does it come from?

Variability is essential for natural selection to work. If all individuals are the same on a given trait, there will be no relative difference in their reproductive success because everyone will be equally adapted to their environments on that trait. Mutations are one source of variability, but sexual reproduction is another important source of variation given that individuals inherit half of their genetic makeup from each of their parents.

Personal Application Questions

You share half of your genetic makeup with each of your parents, but you are no doubt very different from both of them. Spend a few minutes jotting down the similarities and differences between you and your parents. How do you think your unique environment and experiences have contributed to some of the differences you see?

Summary

Genes are sequences of DNA that code for a particular trait. Different versions of a gene are called alleles—sometimes alleles can be classified as dominant or recessive. A dominant allele always results in the dominant phenotype. In order to exhibit a recessive phenotype, an individual must be homozygous for the recessive allele. Genes affect both physical and psychological characteristics. Ultimately, how and when a gene is expressed, and what the outcome will be—in terms of both physical and psychological characteristics—is a function of the interaction between our genes and our environments.

10.

CELLS OF THE NERVOUS SYSTEM

Learning Objectives

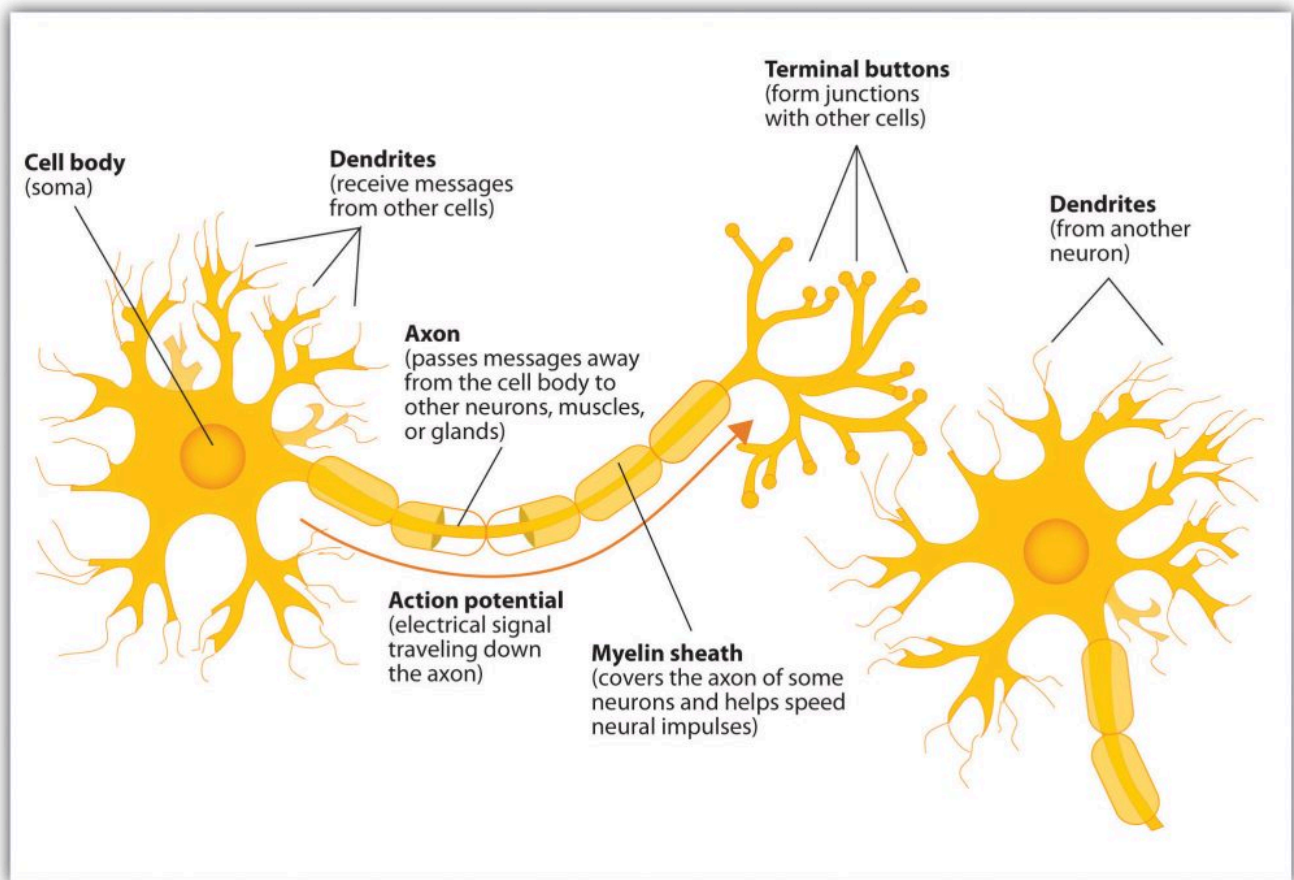
By the end of this section, you will be able to:

- Identify the basic parts of a neuron
- Describe how neurons communicate with each other
- Explain how drugs act as agonists or antagonists for a given neurotransmitter system

Psychologists striving to understand the human mind may study the nervous system. Learning how the cells and organs (like the brain) function helps us understand the biological basis behind human psychology. The nervous system is composed of two basic cell types: glial cells (also known as *glia*) and neurons. Glial cells, which outnumber neurons ten to one, are traditionally thought to play a supportive role to neurons, both physically and metabolically. Glial cells provide scaffolding on which the nervous system is built, help neurons line up closely with each other to allow neuronal communication, provide insulation to neurons, transport nutrients and waste products, and mediate immune responses. Neurons, on the other hand, serve as interconnected information processors that are essential for all of the tasks of the nervous system. This section briefly describes the structure and function of neurons.

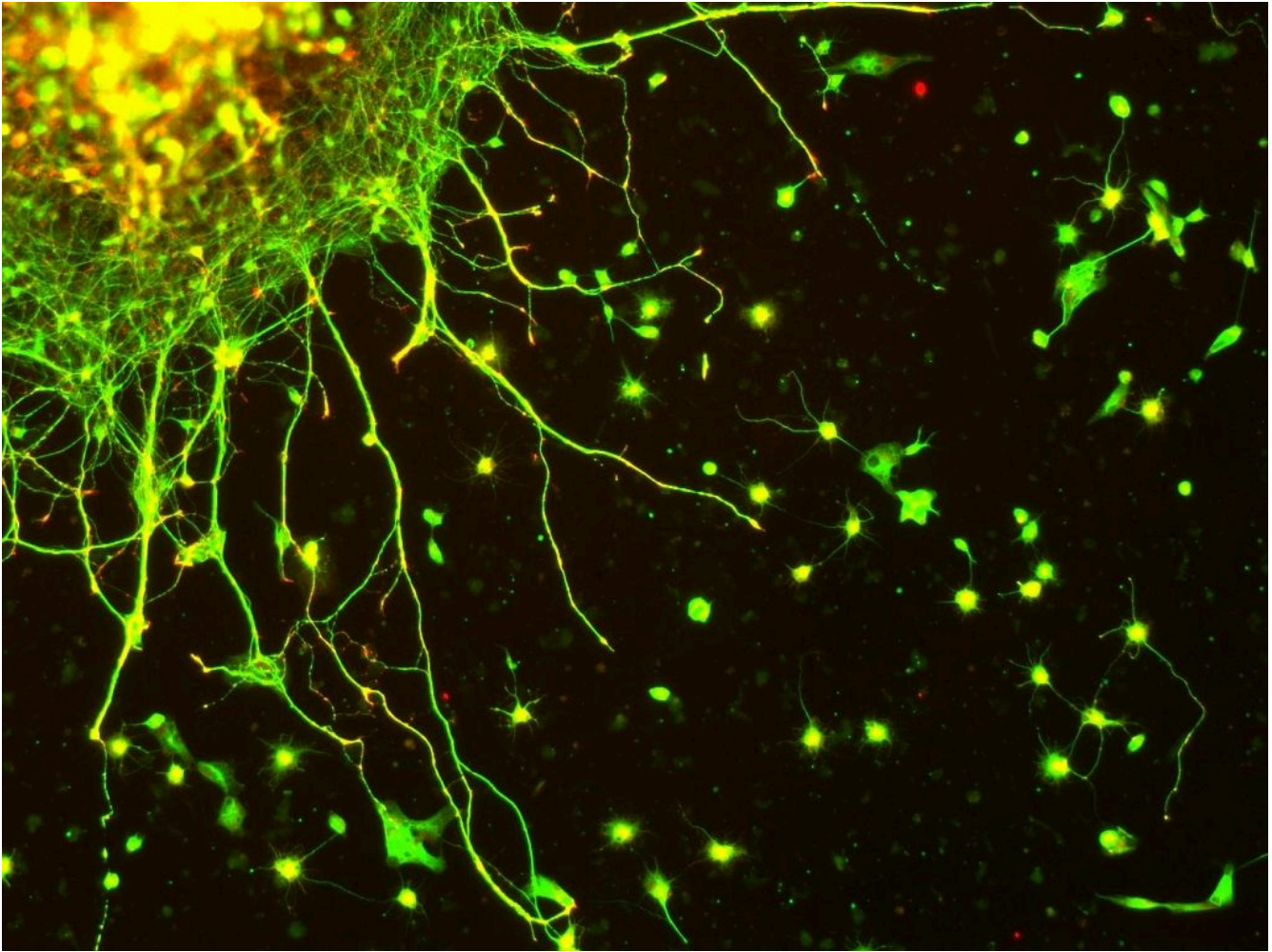
The nervous system is composed of more than 100 billion cells known as *neurons*. A **neuron** is a cell in the nervous system whose function is to receive and transmit information. As you can see in the figure, “Components of the Neuron,” neurons are made up of three major parts: a cell body, or **soma**, which contains the nucleus of the cell and keeps the cell alive; a branching treelike fiber known as the **dendrite**, which collects information from other cells and sends the information to the soma; and a long, segmented fiber known as the **axon**, which transmits information away from the cell body toward other neurons or to the muscles and glands.

Components of the Neuron



Components of the Neuron

Neurons, in vitro color



The nervous system, including the brain, is made up of billions of interlinked neurons. This vast interconnected web is responsible for all human thinking, feeling, and behavior.

Some neurons have hundreds or even thousands of dendrites, and these dendrites may themselves be branched to allow the cell to receive information from thousands of other cells. The axons are also specialized, and some, such as those that send messages from the spinal cord to the muscles in the hands or feet, may be very long—even up to several feet in length. To improve the speed of their communication, and to keep their electrical charges from shorting out with other neurons, axons are often surrounded by a *myelin sheath*. The **myelin sheath** is a layer of fatty tissue surrounding the axon of a neuron that both acts as an insulator and allows faster transmission of the electrical signal. Axons branch out toward their ends, and at the tip of each branch is a *terminal button*.

Neurons Communicate Using Electricity and Chemicals

The nervous system operates using an electrochemical process. An electrical charge moves through the neuron itself and chemicals are used to transmit information between neurons. Within the neuron, when a signal is received by the dendrites, it is transmitted to the soma in the form of an electrical signal, and, if the signal is strong enough, it may then be passed on to the axon and then to the **Terminal buttons** (*axon terminal containing synaptic vesicles*). If the signal reaches the terminal buttons, they are signaled to emit chemicals known as **neurotransmitters** (*chemical messenger of the nervous system*), which communicate with other neurons across the *spaces between the cells*, known as **synapses**.

This video, Neuron Impulse, shows a model of the electrochemical action of the neuron and neurotransmitters.

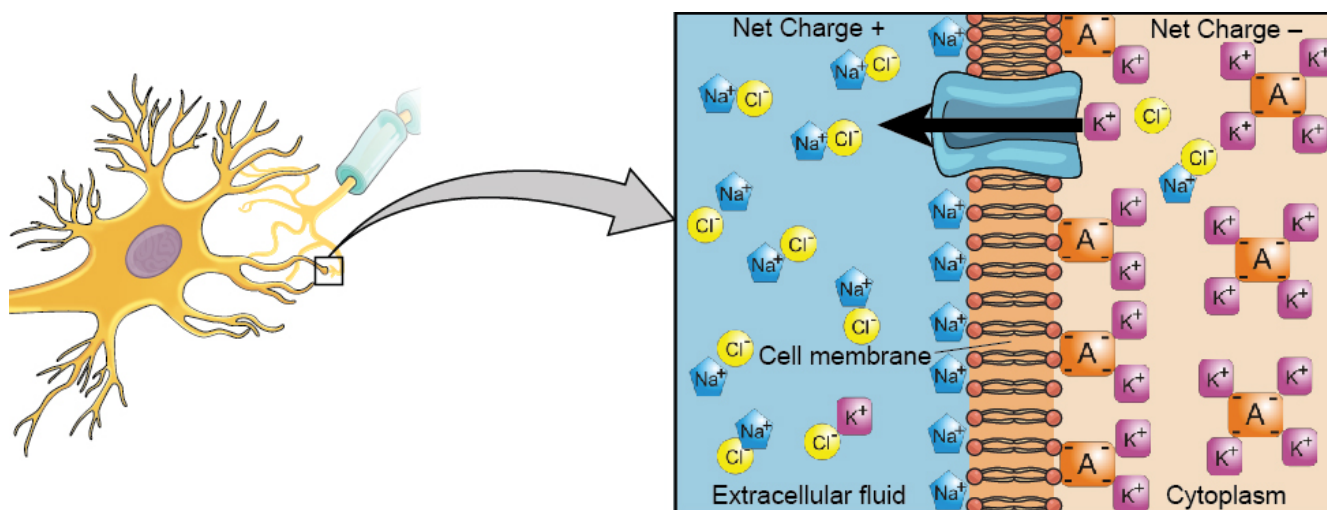


One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=165#oembed-1>

The electrical signal moves through the neuron as a result of changes in the electrical charge of the axon. Normally, the axon remains in the **resting potential**, *a state in which the interior of the neuron contains a greater number of negatively charged ions than does the area outside the cell*. When the segment of the axon that is closest to the cell body is stimulated by an electrical signal from the dendrites, and if this electrical signal is strong enough that it passes a certain level or *threshold*, the cell membrane in this first segment opens its gates, allowing positively charged sodium ions that were previously kept out to enter. This *change in electrical charge that occurs in a neuron when a nerve impulse is transmitted* is known as the **action potential**. Once the action potential occurs, the number of positive ions exceeds the number of negative ions in this segment, and the segment temporarily becomes positively charged.

Between signals, the neuron membrane's potential is held in a state of readiness, called the resting potential. Like a rubber band stretched out and waiting to spring into action, ions line up on either side of the cell membrane, ready to rush across the membrane when the neuron goes active and the membrane opens its gates (i.e., a sodium-potassium pump that allows movement of ions across the membrane). Ions in high-concentration areas are ready to move to low-concentration areas, and positive ions are ready to move to areas with a negative charge.

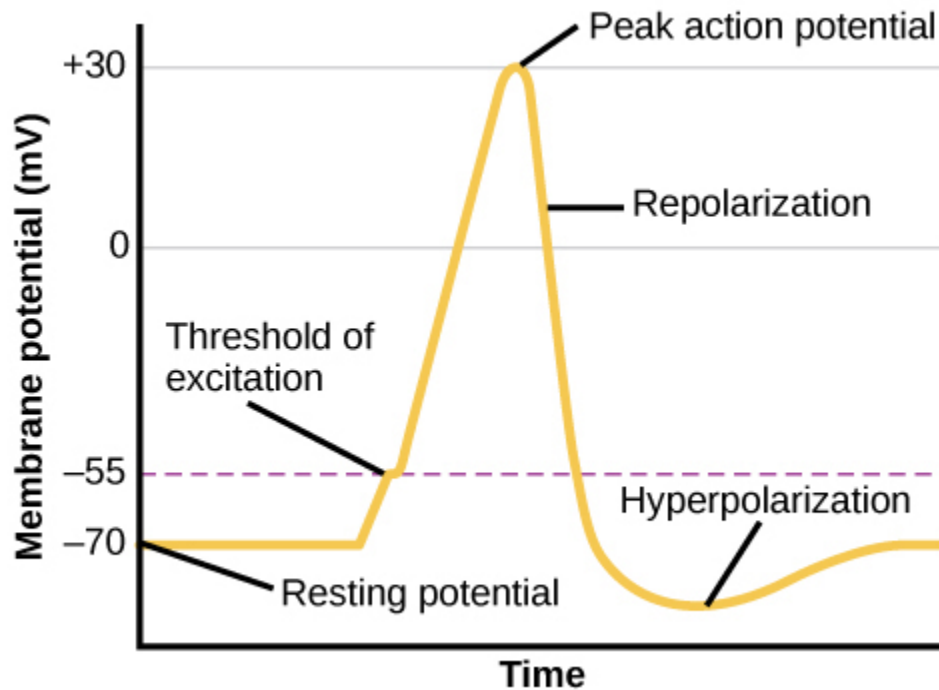
In the resting state, sodium (Na^+) is at higher concentrations outside the cell, so it will tend to move into the cell. Potassium (K^+), on the other hand, is more concentrated inside the cell and will tend to move out of the cell. In addition, the inside of the cell is slightly negatively charged compared to the outside. This provides an additional force on sodium, causing it to move into the cell.



At resting potential, Na^+ (blue pentagons) is more highly concentrated outside the cell in the extracellular fluid (shown in blue), whereas K^+ (purple squares) is more highly concentrated near the membrane in the cytoplasm or intracellular fluid. Other molecules, such as chloride ions (yellow circles) and negatively charged proteins (brown squares), help contribute to a positive net charge in the extracellular fluid and a negative net charge in the intracellular fluid.

From this resting potential state, the neuron receives a signal and its state changes abruptly. When a neuron receives signals at the dendrites—due to neurotransmitters from an adjacent neuron binding to its **receptors** (*protein on the cell surface where neurotransmitters attach*)—small pores, or gates, open on the neuronal membrane, allowing Na^+ ions, propelled by both charge and concentration differences, to move into the cell. With this influx of positive ions, the internal charge of the cell becomes more positive. If that charge reaches a certain level, called the **threshold of excitation** (*level of charge in the membrane that causes the neuron to become active*), the neuron becomes active and the action potential begins.

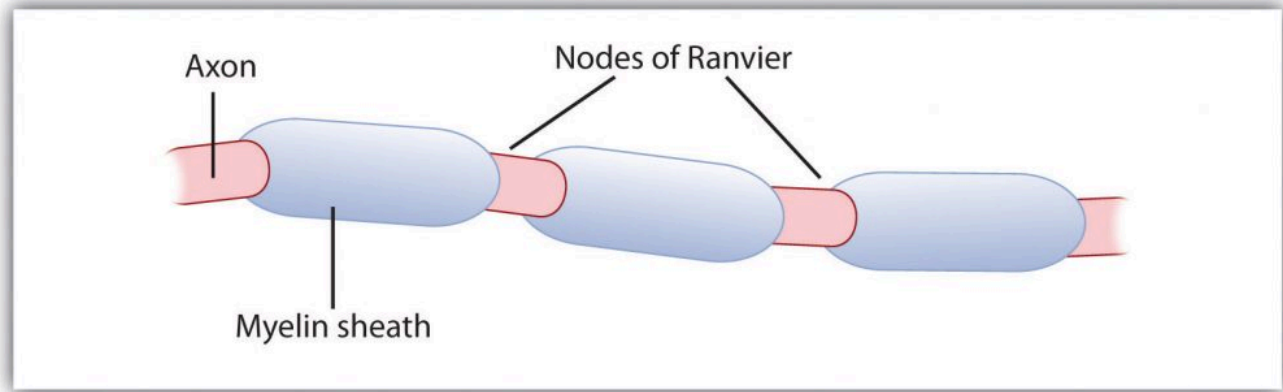
Many additional pores open, causing a massive influx of Na^+ ions and a huge positive spike in the membrane potential, the peak action potential. At the peak of the spike, the sodium gates close and the potassium gates open. As positively charged potassium ions leave, the cell quickly begins repolarization. At first, it hyperpolarizes, becoming slightly more negative than the resting potential, and then it levels off, returning to the resting potential.



During the action potential, the electrical charge across the membrane changes dramatically.

As you can see in the figure “The Myelin Sheath and the Nodes of Ranvier,” the axon is segmented by a series of *breaks between the sausage-like segments of the myelin sheath*. Each of these gaps is a **node of Ranvier**. The electrical charge moves down the axon from segment to segment, in a set of small jumps, moving from node to node. When the action potential occurs in the first segment of the axon, it quickly creates a similar change in the next segment, which then stimulates the next segment and so forth as the positive electrical impulse continues all the way down to the end of the axon. As each new segment becomes positive, the membrane in the prior segment closes up again, and the segment returns to its negative resting potential. In this way the action potential is transmitted along the axon, toward the terminal buttons. The entire response along the length of the axon is very fast—it can happen up to 1,000 times each second.

The Myelin Sheath and the Nodes of Ranvier



The myelin sheath wraps around the axon but also leaves small gaps called the nodes of Ranvier. The action potential jumps from node to node as it travels down the axon.

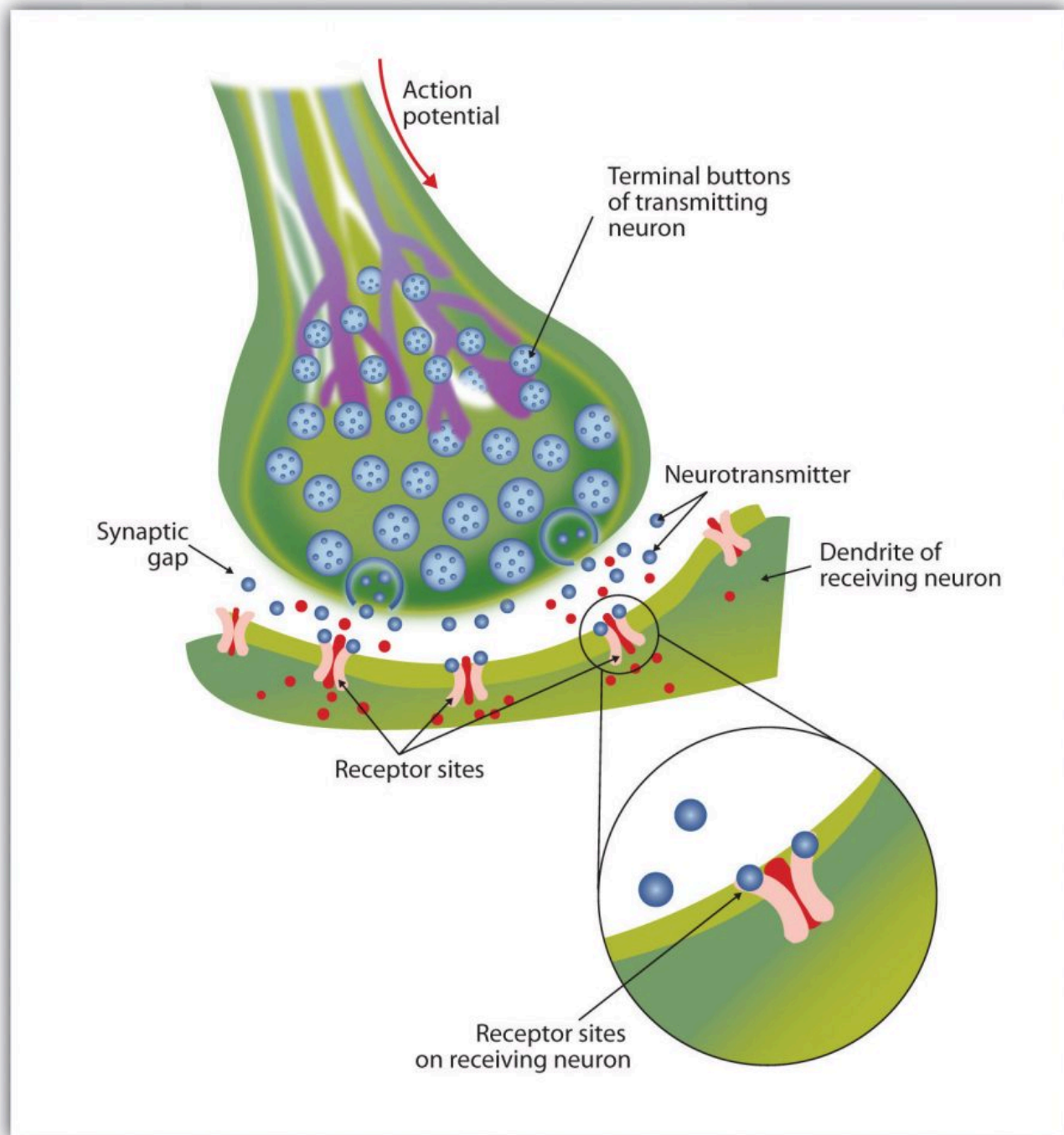
An important aspect of the action potential is that it operates in an *all-or-nothing* manner. What this means is that the neuron either fires completely, such that the action potential moves all the way down the axon, or it does not fire at all. Thus neurons can provide more energy to the neurons down the line by firing faster but not by firing more strongly. Furthermore, the neuron is prevented from repeated firing by the presence of a *refractory period*—a brief time after the firing of the axon in which the axon cannot fire again because the neuron has not yet returned to its resting potential.

Neurotransmitters: The Body's Chemical Messengers

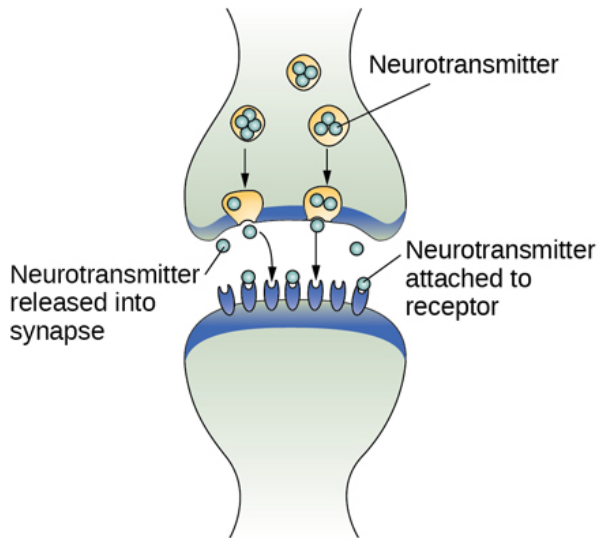
Not only do the neural signals travel via electrical charges *within* the neuron, but they also travel via chemical transmission *between* the neurons. Neurons are separated by junction areas known as **synapses**, *areas where the terminal buttons at the end of the axon of one neuron nearly, but don't quite, touch the dendrites of another*. The synapses provide a remarkable function because they allow each axon to communicate with many dendrites in neighboring cells. Because a neuron may have synaptic connections with thousands of other neurons, the communication links among the neurons in the nervous system allow for a highly sophisticated communication system.

When the electrical impulse from the action potential reaches the end of the axon, it signals the terminal buttons to release neurotransmitters into the synapse. A **neurotransmitter** is *a chemical that relays signals across the synapses between neurons*. Neurotransmitters travel across the synaptic space between the terminal button of one neuron and the dendrites of other neurons, where they bind to the dendrites in the neighboring neurons. Furthermore, different terminal buttons release different neurotransmitters, and different dendrites are particularly sensitive to different neurotransmitters. The dendrites will admit the neurotransmitters only if

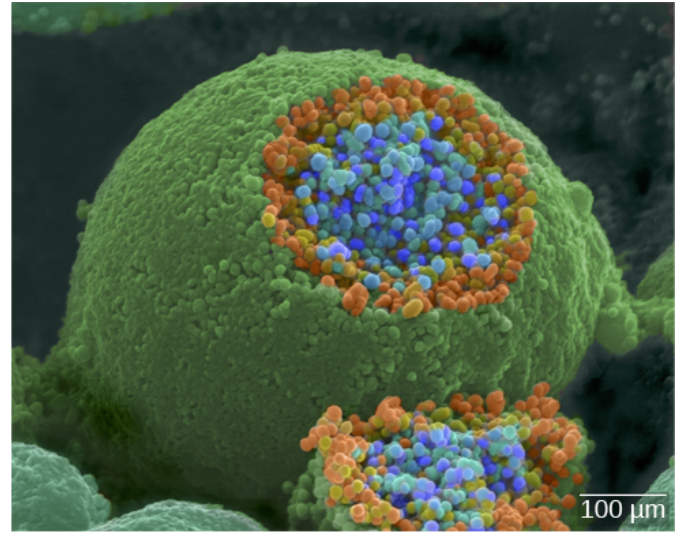
they are the right shape to fit in the receptor sites on the receiving neuron. For this reason, the receptor sites and neurotransmitters are often compared to a lock and key (Figure 3.5 “The Synapse”).



When the nerve impulse reaches the terminal button, it triggers the release of neurotransmitters into the synapse. The neurotransmitters fit into receptors on the receiving dendrites in the manner of a lock and key.



(a)



(b)

(a) The synaptic cleft is the space between the terminal button of one neuron and the dendrite of another neuron. (b) In this pseudo-colored image from a scanning electron microscope, a terminal button (green) has been opened to reveal the synaptic vesicles (orange and blue) inside. Each vesicle contains about 10,000 neurotransmitter molecules. (credit b: modification of work by Tina Carvalho, NIH-NIGMS; scale-bar data from Matt Russell)

When neurotransmitters are accepted by the receptors on the receiving neurons their effect may be either *excitatory* (i.e., they make the cell more likely to fire) or *inhibitory* (i.e., they make the cell less likely to fire). Furthermore, if the receiving neuron is able to accept more than one neurotransmitter, then it will be influenced by the excitatory and inhibitory processes of each. If the excitatory effects of the neurotransmitters are greater than the inhibitory influences of the neurotransmitters, the neuron moves closer to its firing threshold, and if it reaches the threshold, the action potential and the process of transferring information through the neuron begins.

Neurotransmitters that are not accepted by the receptor sites must be removed from the synapse in order for the next potential stimulation of the neuron to happen. This process occurs in part through the breaking down of the neurotransmitters by enzymes, and in part through **reuptake**, *a process in which neurotransmitters that are in the synapse are reabsorbed into the transmitting terminal buttons, ready to again be released after the neuron fires.*

More than 100 chemical substances produced in the body have been identified as neurotransmitters, and these substances have a wide and profound effect on emotion, cognition, and behavior. Neurotransmitters regulate our appetite, our memory, our emotions, as well as our muscle action and movement. And as you can see in Table 3.1 “The Major Neurotransmitters and Their Functions,” some neurotransmitters are also associated with psychological and physical diseases.

Drugs that we might ingest—either for medical reasons or recreationally—can act like neurotransmitters to

influence our thoughts, feelings, and behavior. An **agonist** is *a drug that has chemical properties similar to a particular neurotransmitter and thus mimics the effects of the neurotransmitter*. When an agonist is ingested, it binds to the receptor sites in the dendrites to excite the neuron, acting as if more of the neurotransmitter had been present. As an example, cocaine is an agonist for the neurotransmitter dopamine. Because dopamine produces feelings of pleasure when it is released by neurons, cocaine creates similar feelings when it is ingested. An **antagonist** is *a drug that reduces or stops the normal effects of a neurotransmitter*. When an antagonist is ingested, it binds to the receptor sites in the dendrite, thereby blocking the neurotransmitter. As an example, the poison curare is an antagonist for the neurotransmitter acetylcholine. When the poison enters the brain, it binds to the dendrites, stops communication among the neurons, and usually causes death. Still other drugs work by blocking the reuptake of the neurotransmitter itself—when reuptake is reduced by the drug, more neurotransmitter remains in the synapse, increasing its action.

Certain symptoms of schizophrenia are associated with overactive dopamine neurotransmission. The antipsychotics used to treat these symptoms are antagonists for dopamine—they block dopamine's effects by binding its receptors without activating them. Thus, they prevent dopamine released by one neuron from signaling information to adjacent neurons.

In contrast to agonists and antagonists, which both operate by binding to receptor sites, reuptake inhibitors prevent unused neurotransmitters from being transported back to the neuron. This leaves more neurotransmitters in the synapse for a longer time, increasing its effects. Depression, which has been consistently linked with reduced serotonin levels, is commonly treated with selective serotonin reuptake inhibitors (SSRIs). By preventing reuptake, SSRIs strengthen the effect of serotonin, giving it more time to interact with serotonin receptors on dendrites. Common SSRIs on the market today include Prozac, Paxil, and Zoloft. The drug LSD is structurally very similar to serotonin, and it affects the same neurons and receptors as serotonin. Psychotropic drugs are not instant solutions for people suffering from psychological disorders. Often, an individual must take a drug for several weeks before seeing improvement, and many psychoactive drugs have significant negative side effects. Furthermore, individuals vary dramatically in how they respond to the drugs. To improve chances for success, it is not uncommon for people receiving pharmacotherapy to undergo psychological and/or behavioral therapies as well. Some research suggests that combining drug therapy with other forms of therapy tends to be more effective than any one treatment alone (for one such example, see March et al., 2007).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=165#h5p-38>

Key Takeaways

- The central nervous system (CNS) is the collection of neurons that make up the brain and the spinal cord.
- The peripheral nervous system (PNS) is the collection of neurons that link the CNS to our skin, muscles, and glands.
- Neurons are specialized cells, found in the nervous system, which transmit information. Neurons contain a dendrite, a soma, and an axon.
- Some axons are covered with a fatty substance known as the myelin sheath, which surrounds the axon, acting as an insulator and allowing faster transmission of the electrical signal.
- The dendrite is a treelike extension that receives information from other neurons and transmits electrical stimulation to the soma.
- The axon is an elongated fiber that transfers information from the soma to the terminal buttons.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=165#h5p-39>

11.

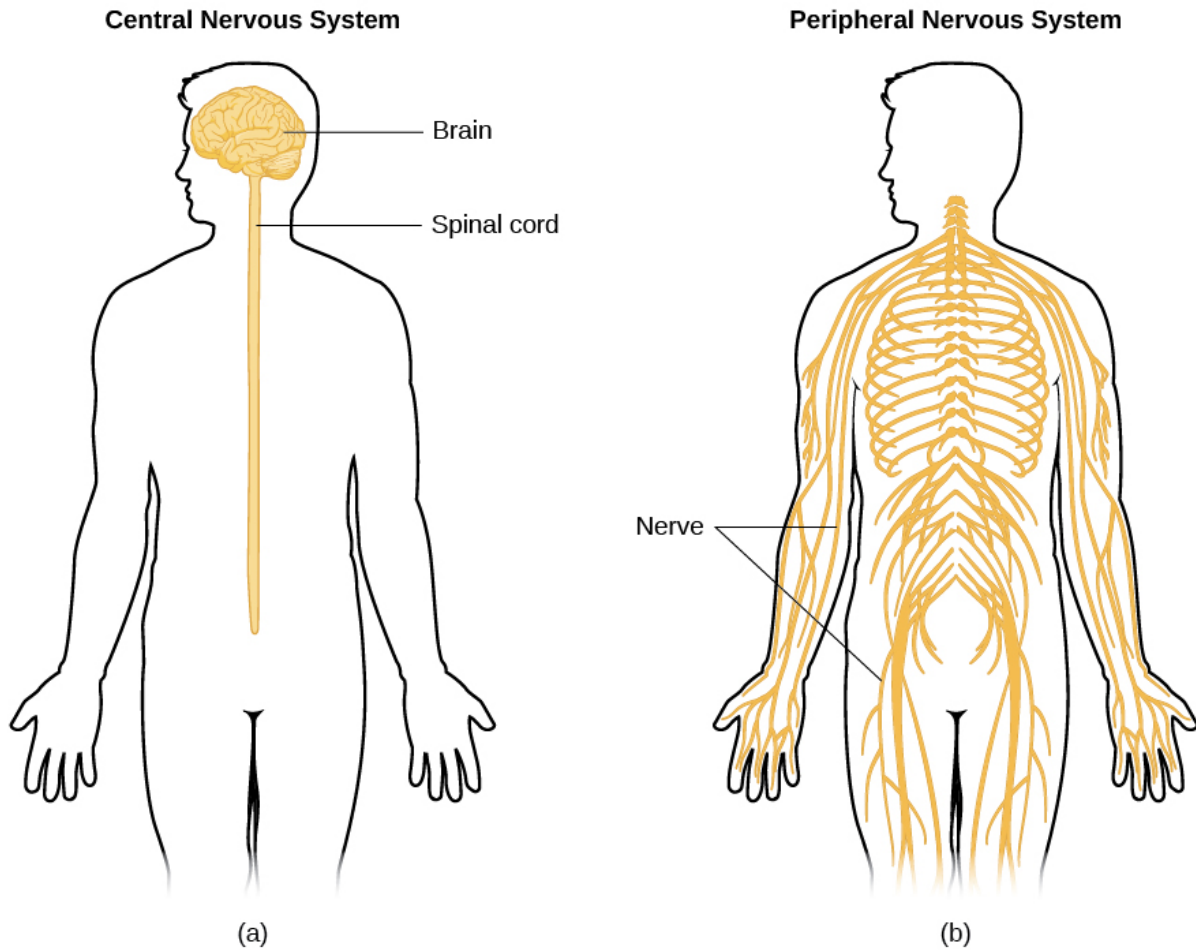
PARTS OF THE NERVOUS SYSTEM

Learning Objectives

By the end of this section, you will be able to:

- Describe the difference between the central and peripheral nervous systems
- Explain the difference between the somatic and autonomic nervous systems
- Differentiate between the sympathetic and parasympathetic divisions of the autonomic nervous system

The nervous system can be divided into two major subdivisions: the **central nervous system** (CNS) (*brain and spinal cord*) and the peripheral nervous system (PNS), as shown in the following image. The CNS is comprised of the brain and spinal cord; the PNS connects the CNS to the rest of the body. In this section, we focus on the peripheral nervous system; later, we look at the brain and spinal cord.



The nervous system is divided into two major parts: (a) the Central Nervous System and (b) the Peripheral Nervous System.

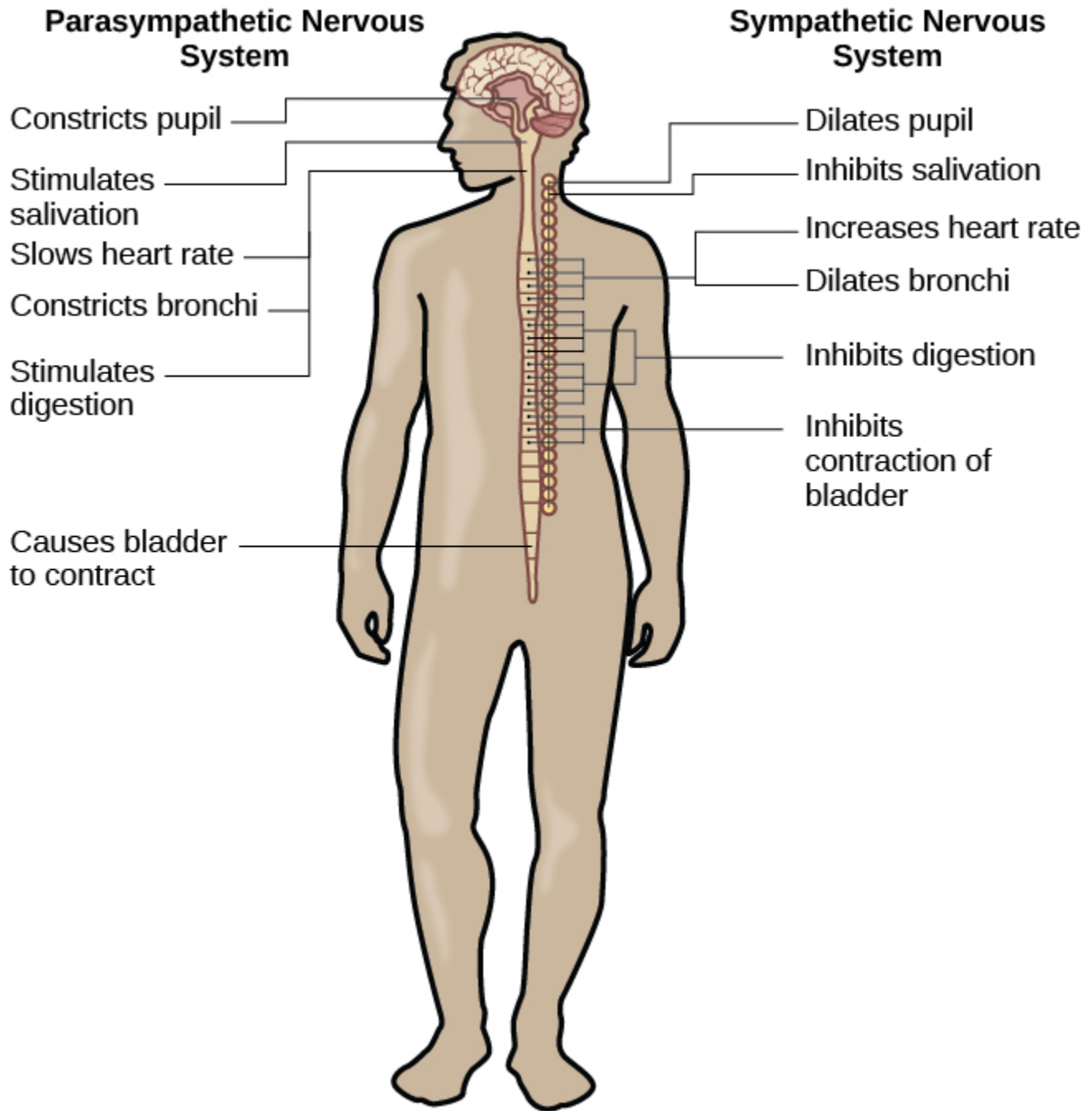
Peripheral Nervous System

The peripheral nervous system is made up of thick bundles of axons, called nerves, carrying messages back and forth between the CNS and the muscles, organs, and senses in the periphery of the body (i.e., everything outside the CNS). The PNS has two major subdivisions: the somatic nervous system and the **autonomic nervous system** (*controls our internal organs and glands*).

The somatic nervous system is associated with activities traditionally thought of as conscious or voluntary. It is involved in the relay of sensory and motor information to and from the CNS; therefore, it consists of motor neurons and sensory neurons. Motor neurons, carrying instructions from the CNS to the muscles, are efferent fibers (efferent means “moving away from”). Sensory neurons, carrying sensory information to the CNS, are afferent fibers (afferent means “moving toward”). Each nerve is basically a two-way superhighway, containing thousands of axons, both efferent and afferent.

The autonomic nervous system controls our internal organs and glands and is generally considered to be

outside the realm of voluntary control. It can be further subdivided into the sympathetic and parasympathetic divisions. The **sympathetic nervous system** is *involved in preparing the body for stress-related activities*; the **parasympathetic nervous system** is *associated with returning the body to routine, day-to-day operations*. The two systems have complementary functions, operating in tandem to maintain the body's homeostasis. **Homeostasis** is *a state of equilibrium*, in which biological conditions (such as body temperature) are maintained at optimal levels.



The sympathetic and parasympathetic divisions of the autonomic nervous system have the opposite effects on various systems.

The sympathetic nervous system is activated when we are faced with stressful or high-arousal situations. The activity of this system was adaptive for our ancestors, increasing their chances of survival. Imagine, for example, that one of our early ancestors, out hunting small game, suddenly disturbs a large bear with her cubs. At that moment, his body undergoes a series of changes—a direct function of sympathetic activation—preparing him to face the threat. His pupils dilate, his heart rate and blood pressure increase, his bladder relaxes, his liver releases glucose, and adrenaline surges into his bloodstream. This constellation of physiological changes, known as the **fight or flight response** (*activation of the sympathetic division of the autonomic nervous system, allowing access to energy reserves and heightened sensory capacity so that we might fight off a given threat or run away to safety*), allows the body access to energy reserves and heightened sensory capacity so that it might fight off a threat or run away to safety.

While it is clear that such a response would be critical for survival for our ancestors, who lived in a world full of real physical threats, many of the high-arousal situations we face in the modern world are more psychological in nature. For example, think about how you feel when you have to stand up and give a presentation in front of a roomful of people, or right before taking a big test. You are in no real physical danger in those situations, and yet you have evolved to respond to any perceived threat with the fight or flight response. This kind of response is not nearly as adaptive in the modern world; in fact, we suffer negative health consequences when faced constantly with psychological threats that we can neither fight nor flee. Recent research suggests that an increase in susceptibility to heart disease (Chandola, Brunner, & Marmot, 2006) and impaired function of the immune system (Glaser & Kiecolt-Glaser, 2005) are among the many negative consequences of persistent and repeated exposure to stressful situations.

Once the threat has been resolved, the parasympathetic nervous system takes over and returns bodily functions to a relaxed state. Our hunter's heart rate and blood pressure return to normal, his pupils constrict, he regains control of his bladder, and the liver begins to store glucose in the form of glycogen for future use. These processes are associated with activation of the parasympathetic nervous system.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=167#h5p-41>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=167#h5p-42>

Critical Thinking Questions

What are the implications of compromised immune function as a result of exposure to chronic stress?

Chronic stress can lead to increased susceptibility to bacterial and viral infections, and potentially an increased risk of cancer. Ultimately, this could be a vicious cycle with stress leading to increased risk of disease, disease states leading to increased stress and so on.

Examine Figure 3.14, illustrating the effects of sympathetic nervous system activation. How would all of these things play into the fight or flight response?

Most of these effects directly impact energy availability and redistribution of key resources and heightened sensory capacity. The individual experiencing these effects would be better prepared to fight or flee.

Personal Application Questions

Hopefully, you do not face real physical threats from potential predators on a daily basis. However, you probably have your fair share of stress. What situations are your most common sources of stress? What can you do to try to minimize the negative consequences of these particular stressors in your life?

Summary

The brain and spinal cord make up the central nervous system. The **peripheral nervous system** (*connects the brain and spinal cord to the muscles, organs, and senses in the periphery of the body*) is comprised of the somatic and autonomic nervous systems. The **somatic nervous system** *transmits sensory and motor signals to and from the central nervous system*. The autonomic nervous system controls the function of our organs and glands and can be divided into the sympathetic and parasympathetic divisions. Sympathetic activation prepares us for fight or flight, while parasympathetic activation is associated with normal functioning under relaxed conditions.

12.

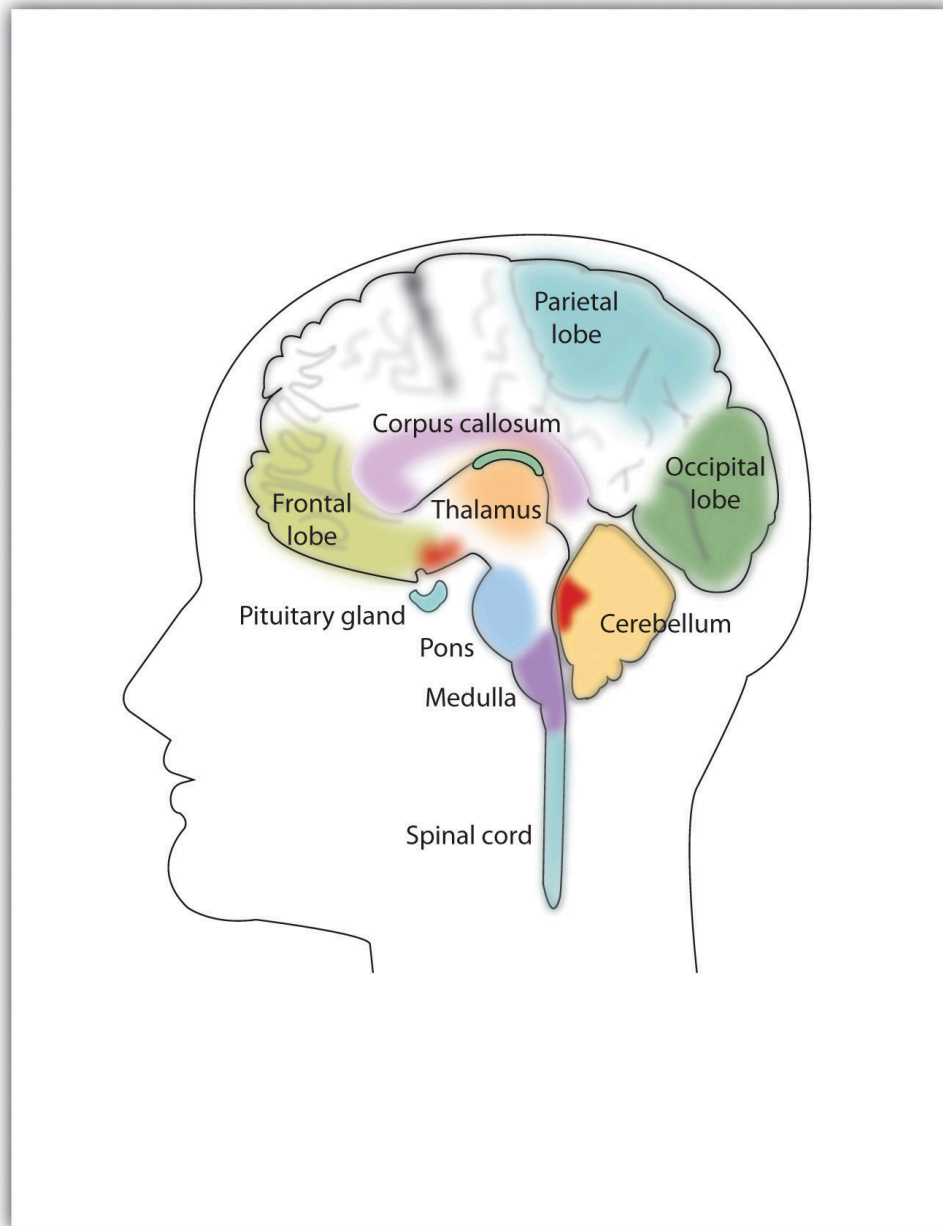
OUR BRAINS CONTROL OUR THOUGHTS, FEELINGS, AND BEHAVIOR

Learning Objectives

- Describe the structures and function of the “old brain” and its influence on behavior.
- Explain the structure of the cerebral cortex (its hemispheres and lobes) and the function of each area of the cortex.
- Define the concepts of brain plasticity, neurogenesis, and brain lateralization.

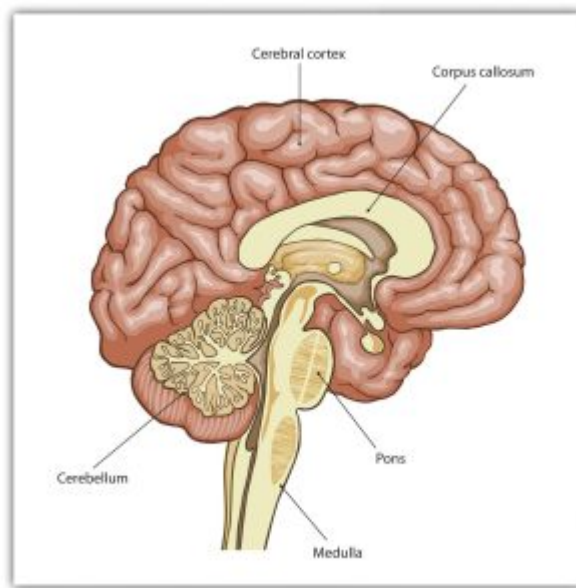
If you were someone who understood brain anatomy and were to look at the brain of an animal that you had never seen before, you would nevertheless be able to deduce the likely capacities of the animal. This is because the brains of all animals are very similar in overall form. In each animal the brain is layered, and the basic structures of the brain are similar (see “The Major Structures in the Human Brain”). The innermost structures of the brain—the parts nearest the spinal cord—are the oldest part of the brain, and these areas carry out the same functions they did for our distant ancestors. The “old brain” regulates basic survival functions, such as breathing, moving, resting, and feeding, and creates our experiences of emotion. Mammals, including humans, have developed further brain layers that provide more advanced functions—for instance, better memory, more sophisticated social interactions, and the ability to experience emotions. Humans have a very large and highly developed outer layer known as the *cerebral cortex* (see “Cerebral Cortex”), which makes us particularly adept at these processes.

The Major Structures in the Human Brain



The major brain parts are colored and labeled. Source: Adapted from Camazine, S. (n.d.). Images of the brain. Medical, science, and nature things: Photography and digital imagery by Scott Camazine.

Cerebral Cortex



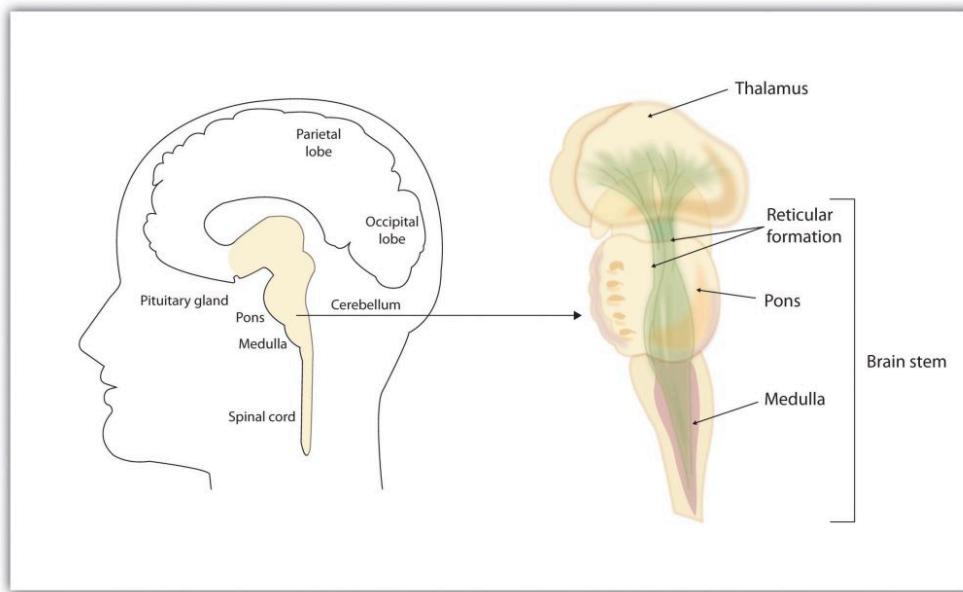
Humans have a very large and highly developed outer brain layer known as the cerebral cortex. The cortex provides humans with excellent memory, outstanding cognitive skills, and the ability to experience complex emotions. Adapted from [Wikia Education](#). (n.d.). Cerebral cortex.

The Old Brain: Wired for Survival

The **brain stem** is *the oldest and innermost region of the brain*. It's designed to control the most basic functions of life, including breathing, attention, and motor responses. The brain stem begins where the spinal cord enters the skull and forms the **medulla**, *the area of the brain stem that controls heart rate and breathing*. In many cases the medulla alone is sufficient to maintain life—animals that have the remainder of their brains above the medulla severed are still able to eat, breathe, and even move. The spherical shape above the medulla is the **pons**, *a structure in the brain stem that helps control the movements of the body, playing a particularly important role in balance and walking*.

Running through the medulla and the pons is a long, narrow network of neurons known as the **reticular formation**. The job of the reticular formation is to filter out some of the stimuli that are coming into the brain from the spinal cord and to relay the remainder of the signals to other areas of the brain. The reticular formation also plays important roles in walking, eating, sexual activity, and sleeping. When electrical stimulation is applied to the reticular formation of an animal, it immediately becomes fully awake, and when the reticular formation is severed from the higher brain regions, the animal falls into a deep coma.

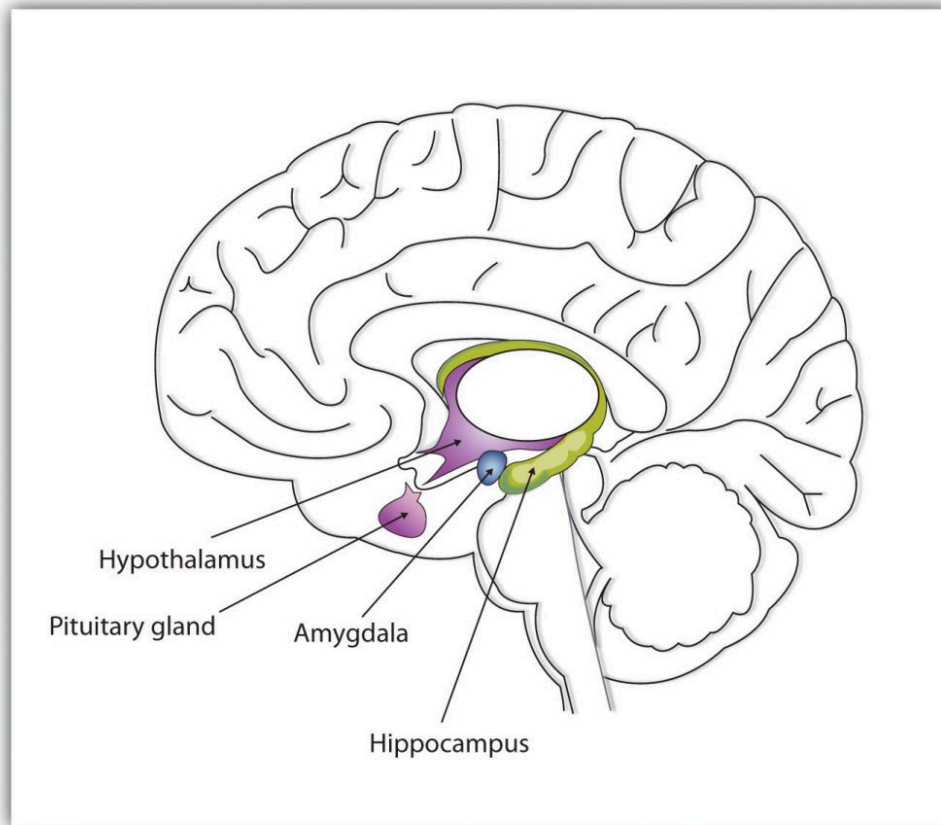
The Brain Stem and the Thalamus



The brain stem is an extension of the spinal cord, including the medulla, the pons, the thalamus, and the reticular formation.

Above the brain stem are other parts of the old brain that also are involved in the processing of behavior and emotions (see “The Limbic System”). The **thalamus** is *the egg-shaped structure above the brain stem that applies still more filtering to the sensory information that is coming up from the spinal cord and through the reticular formation, and it relays some of these remaining signals to the higher brain levels* (Guillery & Sherman, 2002). The thalamus also receives some of the higher brain’s replies, forwarding them to the medulla and the cerebellum. The thalamus is also important in sleep because it shuts off incoming signals from the senses, allowing us to rest.

The Limbic System



This diagram shows the major parts of the limbic system, as well as the pituitary gland, which is controlled by it.

The **cerebellum** (literally, “little brain”) *consists of two wrinkled ovals behind the brain stem. It functions to coordinate voluntary movement.* People who have damage to the cerebellum have difficulty walking, keeping their balance, and holding their hands steady. Consuming alcohol influences the cerebellum, which is why people who are drunk have more difficulty walking in a straight line. Also, the cerebellum contributes to emotional responses, helps us discriminate between different sounds and textures, and is important in learning (Bower & Parsons, 2003).

Whereas the primary function of the brain stem is to regulate the most basic aspects of life, including motor functions, the *limbic system* is largely responsible for memory and emotions, including our responses to reward and punishment. The **limbic system** *is a brain area, located between the brain stem and the two cerebral hemispheres, that governs emotion and memory. It includes the amygdala, the hypothalamus, and the hippocampus.*

The **amygdala** *consists of two “almond-shaped” clusters (amygdala comes from the Latin word for “almond”) and is primarily responsible for regulating our perceptions of, and reactions to, aggression and fear.* The amygdala has connections to other bodily systems related to fear, including the sympathetic nervous system (which

we will see later is important in fear responses), facial responses (which perceive and express emotions), the processing of smells, and the release of neurotransmitters related to stress and aggression (Best, 2009). In one early study, Klüver and Bucy (1939) damaged the amygdala of an aggressive rhesus monkey. They found that the once angry animal immediately became passive and no longer responded to fearful situations with aggressive behavior. Electrical stimulation of the amygdala in other animals also influences aggression. In addition to helping us experience fear, the amygdala also helps us learn from situations that create fear. When we experience events that are dangerous, the amygdala stimulates the brain to remember the details of the situation so that we learn to avoid it in the future (Sigurdsson, Doyère, Cain, & LeDoux, 2007).

Located just under the thalamus (hence its name) the **hypothalamus** is *a brain structure that contains a number of small areas that perform a variety of functions, including the important role of linking the nervous system to the endocrine system via the pituitary gland*. Through its many interactions with other parts of the brain, the hypothalamus helps regulate body temperature, hunger, thirst, and sex and responds to the satisfaction of these needs by creating feelings of pleasure. Olds and Milner (1954) discovered these reward centers accidentally after they had momentarily stimulated the hypothalamus of a rat. The researchers noticed that after being stimulated, the rat continued to move to the exact spot in its cage where the stimulation had occurred, as if it were trying to re-create the circumstances surrounding its original experience. Upon further research into these reward centers, Olds (1958) discovered that animals would do almost anything to re-create enjoyable stimulation, including crossing a painful electrified grid to receive it. In one experiment a rat was given the opportunity to electrically stimulate its own hypothalamus by pressing a pedal. The rat enjoyed the experience so much that it pressed the pedal more than 7,000 times per hour until it collapsed from sheer exhaustion.

The **hippocampus** *consists of two “horns” that curve back from the amygdala*. The hippocampus is important in storing information in long-term memory. If the hippocampus is damaged, a person cannot build new memories, living instead in a strange world where everything he or she experiences just fades away, even while older memories from the time before the damage are untouched.

THE CEREBRAL CORTEX CREATES CONSCIOUSNESS AND THINKING

All animals have adapted to their environments by developing abilities that help them survive. Some animals have hard shells, others run extremely fast, and some have acute hearing. Human beings do not have any of these particular characteristics, but we do have one big advantage over other animals—we are very, very smart.

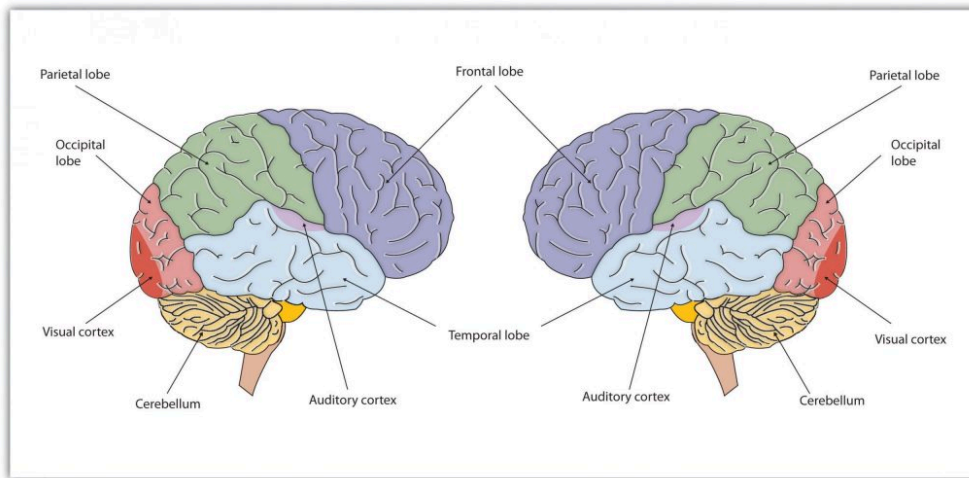
You might think that we should be able to determine the intelligence of an animal by looking at the ratio of the animal's brain weight to the weight of its entire body. But this does not really work. The elephant's brain is one-thousandth of its weight, but the whale's brain is only one-ten-thousandth of its body weight. On the other hand, although the human brain is one 60th of its body weight, the mouse's brain represents one-fortieth of its body weight. Despite these comparisons, elephants do not seem 10 times smarter than whales, and humans definitely seem smarter than mice.

The key to the advanced intelligence of humans is not found in the size of our brains. What sets humans apart from other animals is our larger **cerebral cortex**—*the outer bark-like layer of our brain that allows us to so successfully use language, acquire complex skills, create tools, and live in social groups* (Gibson, 2002). In humans, the cerebral cortex is wrinkled and folded, rather than smooth as it is in most other animals. This creates a much greater surface area and size and allows increased capacities for learning, remembering, and thinking. The folding of the cerebral cortex is referred to as *corticalization*.

Although the cortex is only about one-tenth of an inch thick, it makes up more than 80% of the brain's weight. The cortex contains about 20 billion nerve cells and 300 trillion synaptic connections (de Courten-Myers, 1999). Supporting all these neurons are billions more **glial cells** (glia), *cells that surround and link to the neurons, protecting them, providing them with nutrients, and absorbing unused neurotransmitters*. The glia come in different forms and have different functions. For instance, the myelin sheath surrounding the axon of many neurons is a type of glial cell. The glia are essential partners of neurons, without which the neurons could not survive or function (Miller, 2005).

The cerebral cortex is divided into two *hemispheres*, and each hemisphere is divided into four *lobes*, each separated by folds known as *fissures*. If we look at the cortex starting at the front of the brain and moving over the top (see “The Two Hemispheres”), we see first the **frontal lobe** (behind the forehead), *which is responsible primarily for thinking, planning, memory, and judgment*. Following the frontal lobe is the **parietal lobe**, *which extends from the middle to the back of the skull and which is responsible primarily for processing information about touch*. Then comes the **occipital lobe**, *at the very back of the skull, which processes visual information*. Finally, in front of the occipital lobe (pretty much between the ears) is the **temporal lobe**, *responsible primarily for hearing and language*.

The Two Hemispheres



The brain is divided into two hemispheres (left and right), each of which has four lobes (temporal, frontal, occipital, and parietal). Furthermore, there are specific cortical areas that control different processes.

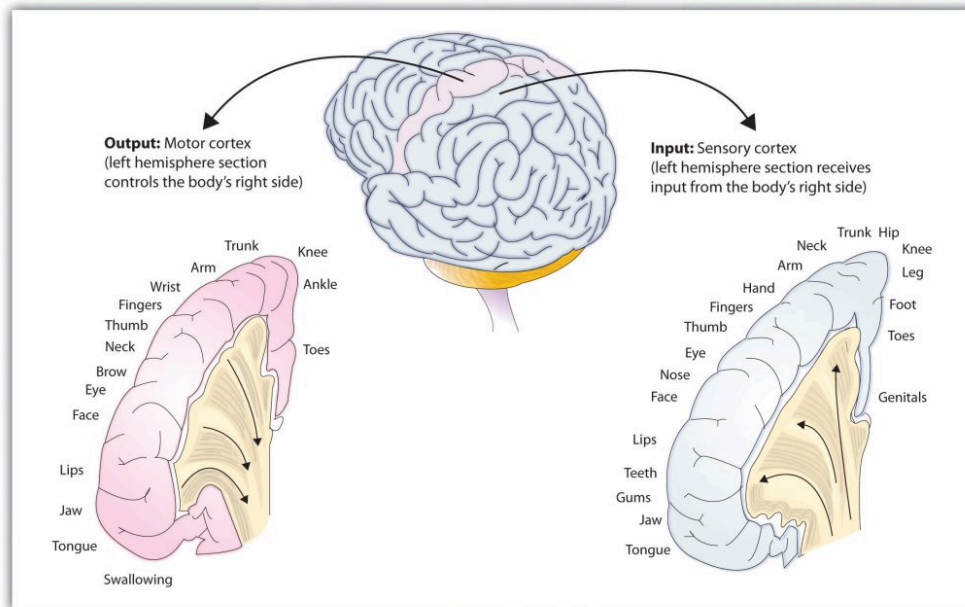
FUNCTIONS OF THE CORTEX

When the German physicists Gustav Fritsch and Eduard Hitzig (1870/2009) applied mild electric stimulation to different parts of a dog's cortex, they discovered that they could make different parts of the dog's body move. Furthermore, they discovered an important and unexpected principle of brain activity. They found that stimulating the right side of the brain produced movement in the left side of the dog's body, and vice versa. This finding follows from a general principle about how the brain is structured, called *contralateral control*. The brain is wired such that in most cases the left hemisphere receives sensations from and controls the right side of the body, and vice versa.

Fritsch and Hitzig also found that the movement that followed the brain stimulation only occurred when they stimulated a specific arch-shaped region that runs across the top of the brain from ear to ear, just at the front of the parietal lobe (see "The Sensory Cortex and the Motor Cortex"). Fritsch and Hitzig had discovered the **motor cortex**, *the part of the cortex that controls and executes movements of the body by sending signals to the cerebellum and the spinal cord*. More recent research has mapped the motor cortex even more fully, by providing mild electronic stimulation to different areas of the motor cortex in fully conscious patients while observing their bodily responses (because the brain has no sensory receptors, these patients feel no pain). As you can see in "The Sensory Cortex and the Motor Cortex," this research has revealed that the motor cortex is

specialized for providing control over the body, in the sense that the parts of the body that require more precise and finer movements, such as the face and the hands, also are allotted the greatest amount of cortical space.

The Sensory Cortex and the Motor Cortex



The portion of the sensory and motor cortex devoted to receiving messages that control specific regions of the body is determined by the amount of fine movement that area is capable of performing. Thus the hand and fingers have as much area in the cerebral cortex as does the entire trunk of the body.

Just as the motor cortex sends out messages to the specific parts of the body, the **somatosensory cortex**, *an area just behind and parallel to the motor cortex at the back of the frontal lobe*, receives information from the skin's sensory receptors and the movements of different body parts. Again, the more sensitive the body region, the more area is dedicated to it in the sensory cortex. Our sensitive lips, for example, occupy a large area in the sensory cortex, as do our fingers and genitals.

Other areas of the cortex process other types of sensory information. The **visual cortex** is *the area located in the occipital lobe (at the very back of the brain) that processes visual information*. If you were stimulated in the visual cortex, you would see flashes of light or color, and perhaps you remember having had the experience of “seeing stars” when you were hit in, or fell on, the back of your head. The temporal lobe, located on the lower side of each hemisphere, contains the **auditory cortex**, *which is responsible for hearing and language*. The temporal lobe also processes some visual information, providing us with the ability to name the objects around us (Martin, 2007).

As you can see in “The Sensory Cortex and the Motor Cortex,” the motor and sensory areas of the cortex account for a relatively small part of the total cortex. The remainder of the cortex is made up of **association**

areas *in which sensory and motor information is combined and associated with our stored knowledge.* These association areas are the places in the brain that are responsible for most of the things that make human beings seem human. The association areas are involved in higher mental functions, such as learning, thinking, planning, judging, moral reflecting, figuring, and spatial reasoning.

THE BRAIN IS FLEXIBLE: NEUROPLASTICITY

The control of some specific bodily functions, such as movement, vision, and hearing, is performed in specified areas of the cortex, and if these areas are damaged, the individual will likely lose the ability to perform the corresponding function. For instance, if an infant suffers damage to facial recognition areas in the temporal lobe, it is likely that he or she will never be able to recognize faces (Farah, Rabinowitz, Quinn, & Liu, 2000). On the other hand, the brain is not divided up in an entirely rigid way. The brain's neurons have a remarkable capacity to reorganize and extend themselves to carry out particular functions in response to the needs of the organism, and to repair damage. As a result, the brain constantly creates new neural communication routes and rewires existing ones. **Neuroplasticity** refers to *the brain's ability to change its structure and function in response to experience or damage.* Neuroplasticity enables us to learn and remember new things and adjust to new experiences.

Our brains are the most “plastic” when we are young children, as it is during this time that we learn the most about our environment. On the other hand, neuroplasticity continues to be observed even in adults (Kolb & Fantie, 1989). The principles of neuroplasticity help us understand how our brains develop to reflect our experiences. For instance, accomplished musicians have a larger auditory cortex compared with the general population (Bengtsson et al., 2005) and also require less neural activity to move their fingers over the keys than do novices (Münste, Altenmüller, & Jäncke, 2002). These observations reflect the changes in the brain that follow our experiences.

Plasticity is also observed when there is damage to the brain or to parts of the body that are represented in the motor and sensory cortexes. When a tumor in the left hemisphere of the brain impairs language, the right hemisphere will begin to compensate to help the person recover the ability to speak (Thiel et al., 2006). And if a person loses a finger, the area of the sensory cortex that previously received information from the missing finger will begin to receive input from adjacent fingers, causing the remaining digits to become more sensitive to touch (Fox, 1984).

Although neurons cannot repair or regenerate themselves as skin or blood vessels can, new evidence suggests that the brain can engage in **neurogenesis**, *the forming of new neurons* (Van Praag, Zhao, Gage, & Gazzaniga, 2004). These new neurons originate deep in the brain and may then migrate to other brain areas where

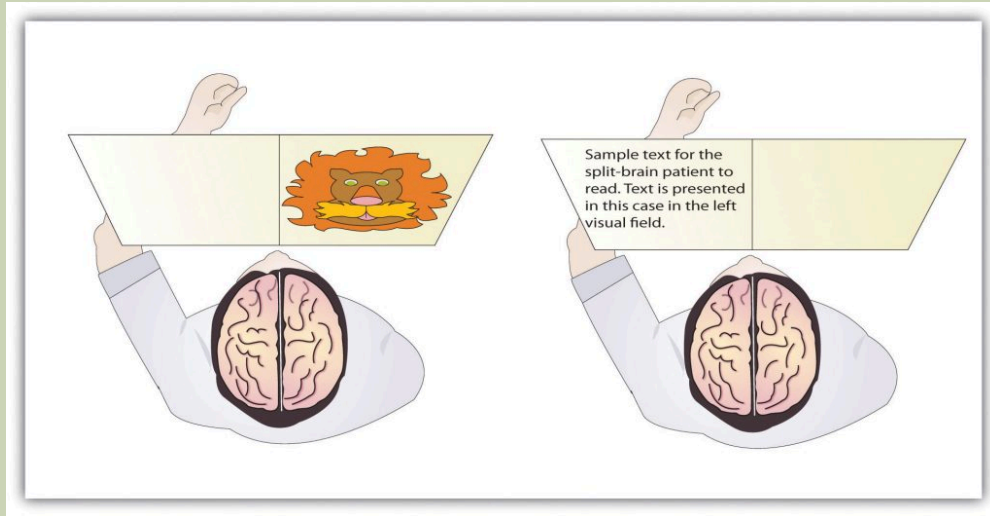
they form new connections with other neurons (Gould, 2007). This leaves open the possibility that someday scientists might be able to “rebuild” damaged brains by creating drugs that help grow neurons.

RESEARCH FOCUS: IDENTIFYING THE UNIQUE FUNCTIONS OF THE LEFT AND RIGHT HEMISPHERES USING SPLIT-BRAIN PATIENTS

We have seen that the left hemisphere of the brain primarily senses and controls the motor movements on the right side of the body, and vice versa. This fact provides an interesting way to study **brain lateralization**—*the idea that the left and the right hemispheres of the brain are specialized to perform different functions*. Gazzaniga, Bogen, and Sperry (1965) studied a patient, known as W. J., who had undergone an operation to relieve severe seizures. In this surgery, *the region that normally connects the two halves of the brain and supports communication between the hemispheres*, known as the **corpus callosum**, is severed. As a result, the patient essentially becomes a person with two separate brains. Because the left and right hemispheres are separated, each hemisphere develops a mind of its own, with its own sensations, concepts, and motivations (Gazzaniga, 2005).

In their research, Gazzaniga and his colleagues tested the ability of W. J. to recognize and respond to objects and written passages that were presented to only the left or to only the right brain hemispheres (see “Visual and Verbal Processing in the Split-Brain Patient”). The researchers had W. J. look straight ahead and then flashed, for a fraction of a second, a picture of a geometrical shape to the left of where he was looking. By doing so, they assured that—because the two hemispheres had been separated—the image of the shape was experienced only in the right brain hemisphere (remember that sensory input from the left side of the body is sent to the right side of the brain). Gazzaniga and his colleagues found that W. J. was able to identify what he had been shown when he was asked to pick the object from a series of shapes, using his left hand, but that he could not do this when the object was shown in the right visual field. On the other hand, W. J. could easily read written material presented in the right visual field (and thus experienced in the left hemisphere) but not when it was presented in the left visual field.

VISUAL AND VERBAL PROCESSING IN THE SPLIT-BRAIN PATIENT



The information that is presented on the left side of our field of vision is transmitted to the right brain hemisphere, and vice versa. In split-brain patients, the severed corpus callosum does not permit information to be transferred between hemispheres, which allows researchers to learn about the functions of each hemisphere. In the sample on the left, the split-brain patient could not choose which image had been presented because the left hemisphere cannot process visual information. In the sample on the right the patient could not read the passage because the right brain hemisphere cannot process language.

This research, and many other studies following it, has demonstrated that the two brain hemispheres specialize in different abilities. In most people the ability to speak, write, and understand language is located in the left hemisphere. This is why W. J. could read passages that were presented on the right side and thus transmitted to the left hemisphere, but could not read passages that were only experienced in the right brain hemisphere. The left hemisphere is also better at math and at judging time and rhythm. It is also superior in coordinating the order of complex movements—for example, lip movements needed for speech. The right hemisphere, on the other hand, has only very limited verbal abilities, and yet it excels in perceptual skills. The right hemisphere is able to recognize objects, including faces, patterns, and melodies, and it can put a puzzle together or draw a picture. This is why W. J. could pick out the image when he saw it on the left, but not the right, visual field.

Although Gazzaniga's research demonstrated that the brain is in fact lateralized, such that the two hemispheres specialize in different activities, this does not mean that when people behave in a certain way or perform a certain activity they are only using one hemisphere of their brains at a time. That would be drastically oversimplifying the concept of brain differences. We normally use both hemispheres at the same time, and the difference between the abilities of the two hemispheres is not absolute (Soroker et al., 2005).

PSYCHOLOGY IN EVERYDAY LIFE: WHY ARE SOME PEOPLE LEFT-HANDED?

Across cultures and ethnic groups, about 90% of people are mainly right-handed, whereas only 10% are primarily left-handed (Peters, Reimers, & Manning, 2006). This fact is puzzling, in part because the number of left-handers is so low, and in part because other animals, including our closest primate relatives, do not show any type of handedness. The existence of right-handers and left-handers provides an interesting example of the relationship among evolution, biology, and social factors and how the same phenomenon can be understood at different levels of analysis (Harris, 1990; McManus, 2002).

At least some handedness is determined by genetics. Ultrasound scans show that 9 out of 10 fetuses suck the thumb of their right hand, suggesting that the preference is determined before birth (Hepper, Wells, & Lynch, 2005), and the mechanism of transmission has been linked to a gene on the X chromosome (Jones & Martin, 2000). It has also been observed that left-handed people are likely to have fewer children, and this may be in part because the mothers of left-handers are more prone to miscarriages and other prenatal problems (McKeever, Cerone, Suter, & Wu, 2000).

But culture also plays a role. In the past, left-handed children were forced to write with their right hands in many countries, and this practice continues, particularly in collectivistic cultures, such as India and Japan, where left-handedness is viewed negatively as compared with individualistic societies, such as the United States. For example, India has about half as many left-handers as the United States (Ida & Mandal, 2003).

There are both advantages and disadvantages to being left-handed in a world where most people are right-handed. One problem for lefties is that the world is designed for right-handers. Automatic teller machines (ATMs), classroom desks, scissors, microscopes, drill presses, and table saws are just some examples of everyday machinery that is designed with the most important controls on the right side. This may explain in part why left-handers suffer somewhat more accidents than right-handers do (Dutta & Mandal, 2006).

Despite the potential difficulty of living and working in a world designed for right-handers, there seem to be some advantages to being left-handed. Throughout history, a number of prominent

artists have been left-handed, including Leonardo da Vinci, Michelangelo, Pablo Picasso, and Max Escher. Because the right hemisphere is superior in imaging and visual abilities, there may be some advantages to using the left hand for drawing or painting (Springer & Deutsch, 1998). Left-handed people are also better at envisioning three-dimensional objects, which may explain why there is such a high number of left-handed architects, artists, and chess players in proportion to their numbers (Coren, 1992). However, there are also more left-handers among those with reading disabilities, allergies, and migraine headaches (Geschwind & Behan, 2007), perhaps due to the fact that a small minority of left-handers owe their handedness to a birth trauma, such as being born prematurely (Betancur, Vélez, Cabanieu, & le Moal, 1990).

In sports in which handedness may matter, such as tennis, boxing, fencing, or judo, left-handers may have an advantage. They play many games against right-handers and learn how to best handle their styles. Right-handers, however, play very few games against left-handers, which may make them more vulnerable. This explains why a disproportionately high number of left-handers are found in sports where direct one-on-one action predominates. In other sports, such as golf, there are fewer left-handed players because the handedness of one player has no effect on the competition.

The fact that left-handers excel in some sports suggests the possibility that they may have also had an evolutionary advantage because their ancestors may have been more successful in important skills such as hand-to-hand combat (Bodmer & McKie, 1994). At this point, however, this idea remains only a hypothesis, and determinants of human handedness are yet to be fully understood.

Exercises and Critical Thinking

- Do you think that animals experience emotion? What aspects of brain structure might lead you to believe that they do or do not?
- Consider your own experiences and speculate on which parts of your brain might be particularly well developed as a result of these experiences.
- Which brain hemisphere are you likely to be using when you search for a fork in the silverware drawer? Which brain hemisphere are you most likely to be using when you struggle to remember the name of an old friend?
- Do you think that encouraging left-handed children to use their right hands is a good

idea? Why or why not?

13.

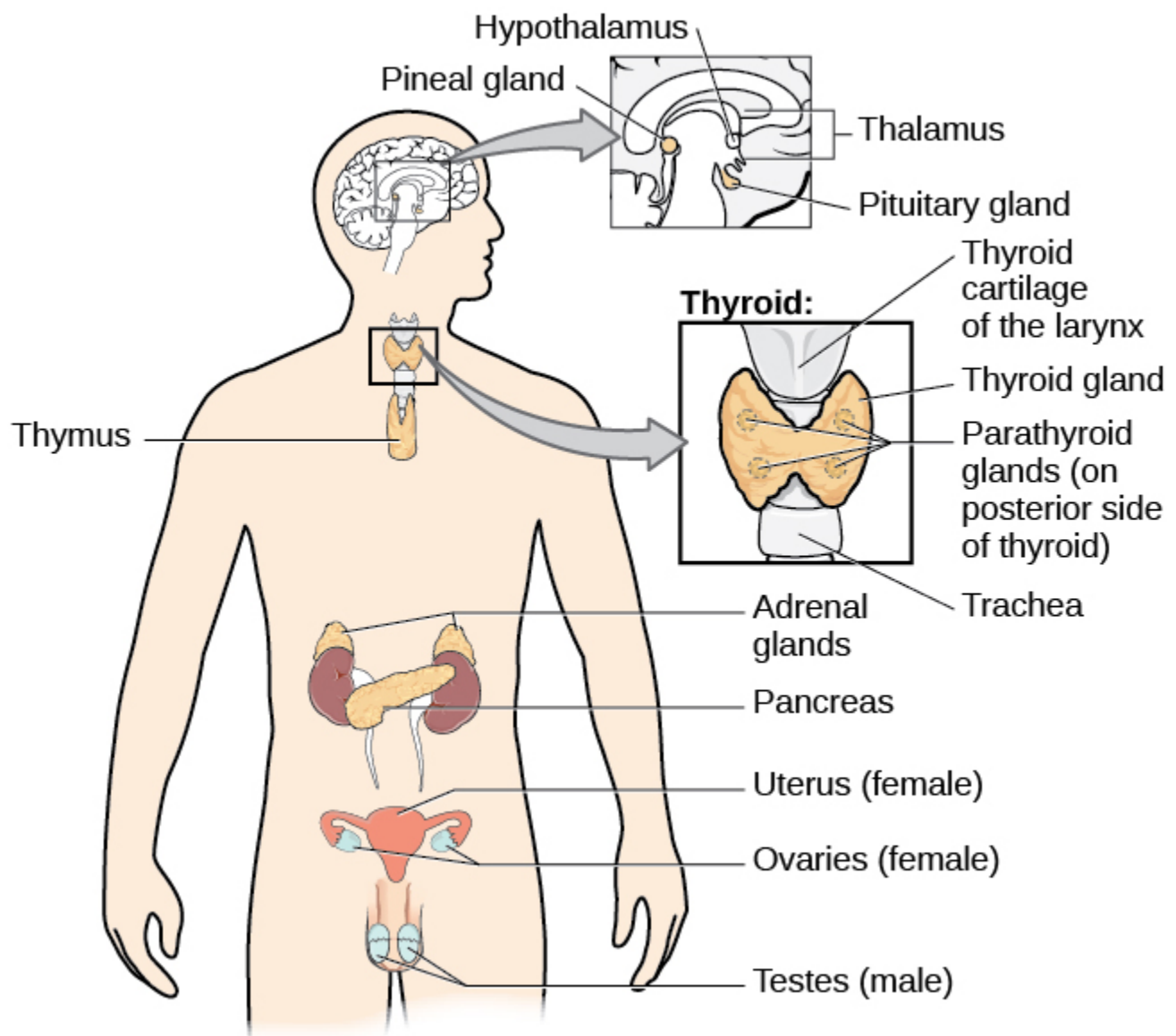
THE ENDOCRINE SYSTEM

Learning Objectives

By the end of this section, you will be able to:

- Identify the major glands of the endocrine system
- Identify the hormones secreted by each gland
- Describe each hormone's role in regulating bodily functions

The endocrine system consists of a series of glands that produce chemical substances known as hormones. Like neurotransmitters, hormones are chemical messengers that must bind to a receptor in order to send their signal. However, unlike neurotransmitters, which are released in close proximity to cells with their receptors, hormones are secreted into the bloodstream and travel throughout the body, affecting any cells that contain receptors for them. Thus, whereas neurotransmitters' effects are localized, the effects of hormones are widespread. Also, hormones are slower to take effect and tend to be longer lasting.



The major glands of the endocrine system are shown.

Hormones are involved in regulating all sorts of bodily functions, and they are ultimately controlled through interactions between the hypothalamus (in the central nervous system) and the pituitary gland (in the endocrine system). Imbalances in hormones are related to a number of disorders. This section explores some of the major glands that make up the endocrine system and the hormones secreted by these glands.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=172#h5p-49>

Major Glands

The pituitary gland descends from the hypothalamus at the base of the brain and acts in close association with it. The pituitary is often referred to as the “master gland” because its messenger hormones control all the other glands in the endocrine system, although it mostly carries out instructions from the hypothalamus. In addition to messenger hormones, the pituitary also secretes growth hormone, endorphins for pain relief, and a number of key hormones that regulate fluid levels in the body.

Located in the neck, the thyroid gland releases hormones that regulate growth, metabolism, and appetite. In hyperthyroidism, or Grave’s disease, the thyroid secretes too much of the hormone thyroxine, causing agitation, bulging eyes, and weight loss. In hypothyroidism, reduced hormone levels cause sufferers to experience tiredness, and they often complain of feeling cold. Fortunately, thyroid disorders are often treatable with medications that help reestablish a balance in the hormones secreted by the thyroid.

The adrenal glands sit atop our kidneys and secrete hormones involved in the stress response, such as epinephrine (adrenaline) and norepinephrine (noradrenaline). The pancreas is an internal organ that secretes hormones that regulate blood sugar levels: insulin and glucagon. These pancreatic hormones are essential for maintaining stable levels of blood sugar throughout the day by lowering blood glucose levels (insulin) or raising them (glucagon). People who suffer from diabetes do not produce enough insulin; therefore, they must take medications that stimulate or replace insulin production, and they must closely control the amount of sugars and carbohydrates they consume.

The gonads secrete sexual hormones, which are important in reproduction, and mediate both sexual motivation and behavior. The female gonads are the ovaries; the male gonads are the testes. Ovaries secrete estrogens and progesterone, and the testes secrete androgens, such as testosterone.

Athletes and Anabolic Steroids

Although it is against federal laws and many professional athletic associations (The National Football League, for example) have banned their use, anabolic steroid drugs continue to be used by amateur and professional athletes. The drugs are believed to enhance athletic performance. Anabolic steroid drugs mimic the effects of the body's own steroid hormones, like testosterone and its derivatives. These drugs have the potential to provide a competitive edge by increasing muscle mass, strength, and endurance, although not all users may experience these results. Moreover, use of performance-enhancing drugs (PEDs) does not come without risks. Anabolic steroid use has been linked with a wide variety of potentially negative outcomes, ranging in severity from largely cosmetic (acne) to life-threatening (heart attack). Furthermore, use of these substances can result in profound changes in mood and can increase aggressive behavior (National Institute on Drug Abuse, 2001).

Baseball player Alex Rodriguez (A-Rod) has been at the center of a media storm regarding his use of illegal PEDs. Rodriguez's performance on the field was unparalleled while using the drugs; his success played a large role in negotiating a contract that made him the highest-paid player in professional baseball. Although Rodriguez maintains that he has not used PEDs for several years, he received a substantial suspension in 2013 that, if upheld, will cost him more than 20 million dollars in earnings (Gaines, 2013). What are your thoughts on athletes and doping? Why or why not should the use of PEDs be banned? What advice would you give an athlete who was considering using PEDs?

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=172#h5p-50>

Summary

The glands of the endocrine system secrete hormones to regulate normal body functions. The hypothalamus serves as the interface between the nervous system and the endocrine system, and it controls the secretions of

the pituitary. The pituitary serves as the master gland, controlling the secretions of all other glands. The thyroid secretes thyroxine, which is important for basic metabolic processes and growth; the adrenal glands secrete hormones involved in the stress response; the pancreas secretes hormones that regulate blood sugar levels; and the ovaries and testes produce sex hormones that regulate sexual motivation and behavior.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=172#h5p-51>

Critical Thinking Questions

Hormone secretion is often regulated through a negative feedback mechanism, which means that once a hormone is secreted it will cause the hypothalamus and pituitary to shut down the production of signals necessary to secrete the hormone in the first place. Most oral contraceptives are made of small doses of estrogen and/or progesterone. Why would this be an effective means of contraception?

The introduction of relatively low, yet constant, levels of gonadal hormones places the hypothalamus and pituitary under inhibition via negative feedback mechanisms. This prevents the alterations in both estrogen and progesterone concentrations that are necessary for successful ovulation and implantation.

Chemical messengers are used in both the nervous system and the endocrine system. What properties do these two systems share? What properties are different? Which one would be faster? Which one would result in long-lasting changes?

Both systems involve chemical messengers that must interact with receptors in order to have an effect. The relative proximity of the release site and target tissue varies dramatically between the two systems. In neurotransmission, reuptake and enzymatic breakdown immediately clear the synapse. Metabolism of hormones must occur in the liver. Therefore, while neurotransmission is much more rapid in signaling information, hormonal signaling can persist for quite some time as the concentrations of the hormone in the bloodstream vary gradually over time.

Personal Application Questions

Given the negative health consequences associated with the use of anabolic steroids, what kinds of considerations might be involved in a person's decision to use them?

14.

REFERENCES

- Arnst, C. (2003, November). Commentary: Getting rational about health-care rationing. *Bloomberg Businessweek Magazine*. Retrieved from <http://www.businessweek.com/stories/2003-11-16/commentary-getting-rational-about-health-care-rationing>
- Berridge, K. C., & Robinson, T. E. (1998). What is the role of dopamine in reward: Hedonic impact, reward learning, or incentive salience? *Brain Research Reviews*, 28, 309–369.
- Chandola, T., Brunner, E., & Marmot, M. (2006). Chronic stress at work and the metabolic syndrome: A prospective study. *BMJ*, 332, 521–524.
- Comings, D. E., Gonzales, N., Saucier, G., Johnson, J. P., & MacMurray, J. P. (2000). The DRD4 gene and the spiritual transcendence scale of the character temperament index. *Psychiatric Genetics*, 10, 185–189.
- Confer, J. C., Easton, J. A., Fleischman, D. S., Goetz, C. D., Lewis, D. M. G., Perilloux, C., & Buss, D. M. (2010). Evolutionary psychology: Controversies, questions, prospects, and limitations. *American Psychologist*, 65, 110–126.
- Gaines, C. (2013, August). An A-Rod suspension would save the Yankees as much as \$37.5 million in 2014 alone. *Business Insider*. Retrieved from <http://www.businessinsider.com/an-a-rod-suspension-would-save-the-yankees-as-much-as-375-million-in-2014-2013-8>
- Gardner, E. L. (2011). Addiction and brain reward and antireward pathways. *Advances in Psychosomatic Medicine*, 30, 22–60.
- George, O., Le Moal, M., & Koob, G. F. (2012). Allostasis and addiction: Role of the dopamine and corticotropin-releasing factor systems. *Physiology & Behavior*, 106, 58–64.
- Glaser, R., & Kiecolt-Glaser, J. K. (2005). Stress-induced immune dysfunction: Implications for health. *Nature Reviews Immunology*, 5, 243–251.
- Gong, L., Parikh, S., Rosenthal, P. J., & Greenhouse, B. (2013). Biochemical and immunological mechanisms by which sickle cell trait protects against malaria. *Malaria Journal*. Advance online publication. doi:10.1186/1475-2875-12-317
- Hardt, O., Einarsson, E. Ö., & Nader, K. (2010). A bridge over troubled water: Reconsolidation as a link between cognitive and neuroscientific memory research traditions. *Annual Review of Psychology*, 61, 141–167.
- Macmillan, M. (1999). The Phineas Gage Information Page. Retrieved from <http://www.uakron.edu/gage>
- March, J. S., Silva, S., Petrycki, S., Curry, J., Wells, K., Fairbank, J., ... Severe, J. (2007). The treatment for adolescents with depression study (TADS): Long-term effectiveness and safety outcomes. *Arch Gen Psychiatry*, 64, 1132–1143.

Mustanski, B. S., DuPree, M. G., Nievergelt, C. M., Bocklandt, S., Schork, N. J., & Hamer, D. H. (2005). A genome wide scan of male sexual orientation. *Human Genetics*, 116, 272–278.

National Institute on Drug Abuse. (2001, July). Anabolic steroid abuse: What are the health consequences of steroid abuse? *National Institutes of Health*. Retrieved from <http://www.drugabuse.gov/publications/research-reports/anabolic-steroid-abuse/what-are-health-consequences-steroid-abuse>

Squire, L. R. (2009). The legacy of patient H. M. for neuroscience. *Neuron*, 61, 6–9.

Tienari, P., Wynne, L. C., Sorri, A., et al. (2004). Genotype–environment interaction in schizophrenia spectrum disorder: Long-term follow-up study of Finnish adoptees. *British Journal of Psychiatry*, 184, 216–222.

University of Utah Genetic Science Learning Center. (n.d.). What are genetic disorders? Retrieved from <http://learn.genetics.utah.edu/content/disorders/whataregd/>

PART IV

STATES OF CONSCIOUSNESS



Sleep, which we all experience, is a quiet and mysterious pause in our daily lives. Two sleeping children are depicted in this 1895 oil painting titled *Zwei schlafende Mädchen auf der Ofenbank*, which translates as “two sleeping girls on the stove,” by Swiss painter Albert Anker.

Our lives involve regular, dramatic changes in the degree to which we are aware of our surroundings and our internal states. While awake, we feel alert and aware of the many important things going on around us. Our experiences change dramatically while we are in deep sleep and once again when we are dreaming.

This chapter will discuss states of consciousness with a particular emphasis on sleep. The different stages of sleep will be identified, and sleep disorders will be described. The chapter will close with discussions of altered states of consciousness produced by psychoactive drugs, hypnosis, and meditation.

15.

WHAT IS CONSCIOUSNESS?

Learning Objectives

By the end of this section, you will be able to:

- Explain what consciousness is
- Explain why we sleep
- Describe the stages of sleep
- Identify substance use and abuse

Introduction

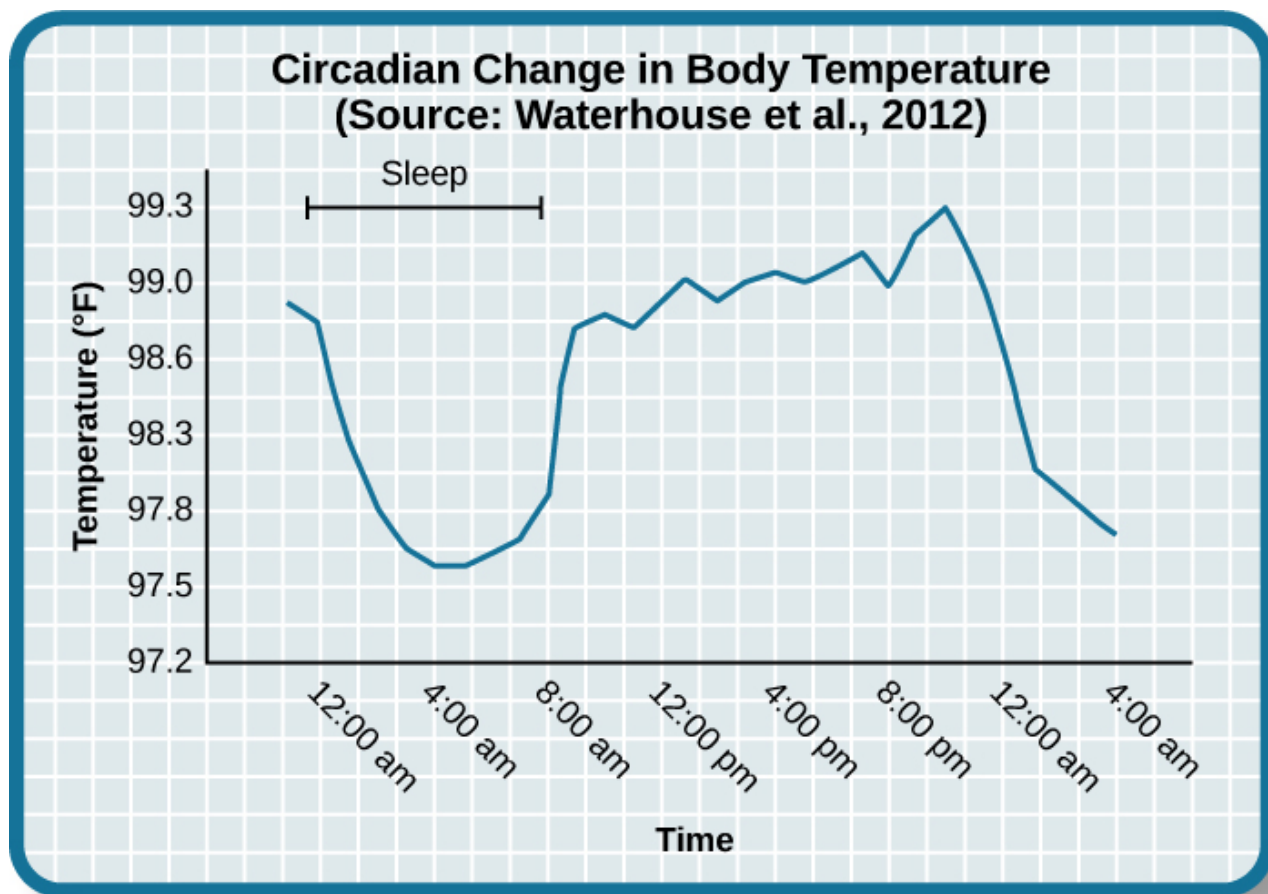
Consciousness is our awareness of internal and external stimuli. Awareness of internal stimuli includes feeling pain, hunger, thirst, sleepiness, and being aware of our thoughts and emotions. Awareness of external stimuli includes seeing the light from the sun, feeling the warmth of a room, and hearing the voice of a friend.

We experience different states of consciousness and different levels of awareness on a regular basis. We might even describe consciousness as a continuum that ranges from full awareness to a deep sleep. Sleep is a state marked by relatively low levels of physical activity and reduced sensory awareness that is distinct from periods of rest that occur during wakefulness. **Wakefulness** is characterized by high levels of sensory awareness, thought, and behavior. In between these extremes are states of consciousness related to daydreaming, intoxication as a result of alcohol or other drug use, meditative states, hypnotic states, and altered states of consciousness following sleep deprivation. We might also experience unconscious states of being via drug-induced anesthesia for medical purposes. Often, we are not completely aware of our surroundings, even when we are fully awake. For instance, have you ever daydreamed while driving home from work or school without really thinking about the drive itself? You were capable of engaging in all of the complex tasks involved with

operating a motor vehicle even though you were not aware of doing so. Many of these processes, like much of psychological behavior, are rooted in our biology.

Biological Rhythms

Biological rhythms are internal rhythms of biological activity. A woman's menstrual cycle is an example of a biological rhythm—a recurring, cyclical pattern of bodily changes. One complete menstrual cycle takes about 28 days—a lunar month—but many biological cycles are much shorter. For example, body temperature fluctuates cyclically over a 24-hour period. Alertness is associated with higher body temperatures, and sleepiness with lower body temperatures.



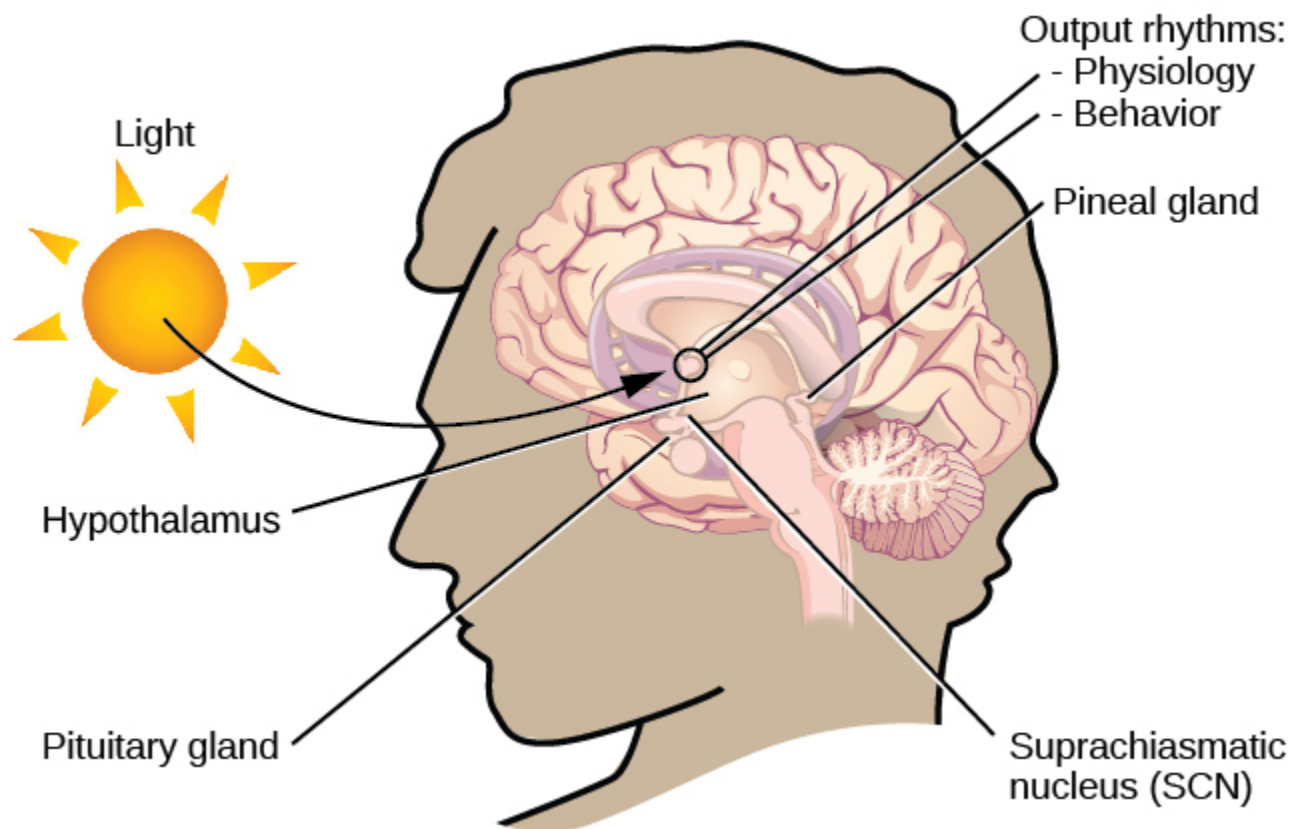
This chart illustrates the circadian change in body temperature over 28 hours in a group of eight young men. Body temperature rises throughout the waking day, peaking in the afternoon, and falls during sleep with the lowest point occurring during the very early morning hours.

This pattern of temperature fluctuation, which repeats every day, is one example of a circadian rhythm. A **circadian rhythm** is a biological rhythm that takes place over a period of about 24 hours. Our sleep-wake

cycle, which is linked to our environment's natural light-dark cycle, is perhaps the most obvious example of a circadian rhythm, but we also have daily fluctuations in heart rate, blood pressure, blood sugar, and body temperature. Some circadian rhythms play a role in changes in our state of consciousness.

If we have biological rhythms, then is there some sort of biological clock? In the brain, the **hypothalamus**, which lies above the pituitary gland, is the main center of homeostasis. **Homeostasis** is the tendency to maintain a balance, or optimal level, within a biological system.

The brain's clock mechanism is located in an area of the hypothalamus known as the suprachiasmatic nucleus (SCN). The axons of light-sensitive neurons in the retina provide information to the SCN based on the amount of light present, allowing this internal clock to be synchronized with the outside world (Klein, Moore, & Reppert, 1991; Welsh, Takahashi, & Kay, 2010).



The suprachiasmatic nucleus (SCN) serves as the brain's clock mechanism. The clock sets itself with light information received through projections from the retina.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=314#h5p-81>

Problems with Circadian Rhythms

Generally, and for most people, our circadian cycles are aligned with the outside world. For example, most people sleep during the night and are awake during the day. One important regulator of sleep-wake cycles is the hormone melatonin. The pineal gland, an endocrine structure located inside the brain that releases melatonin, is thought to be involved in the regulation of various biological rhythms and of the immune system during sleep (Hardeland, Pandi-Perumal, & Cardinali, 2006). Melatonin release is stimulated by darkness and inhibited by light.

There are individual differences with regard to our sleep-wake cycle. For instance, some people would say they are morning people, while others would consider themselves to be night owls. These individual differences in circadian patterns of activity are known as a person's chronotype, and research demonstrates that morning larks and night owls differ with regard to sleep regulation (Taillard, Philip, Coste, Sagaspe, & Bioulac, 2003). Sleep regulation refers to the brain's control of switching between sleep and wakefulness as well as coordinating this cycle with the outside world.

Watch this brief video describing circadian rhythms and how they affect sleep: [Reprogramming Our Circadian Rhythms for the Modern World](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=314#oembed-1>

Disruptions of Normal Sleep

Whether lark, owl, or somewhere in between, there are situations in which a person's circadian clock gets out of synchrony with the external environment. One way that this happens involves traveling across multiple time zones. When we do this, we often experience jet lag. Jet lag is a collection of symptoms that results from the mismatch between our internal circadian cycles and our environment. These symptoms include fatigue, sluggishness, irritability, and insomnia (i.e., a consistent difficulty in falling or staying asleep for at least three nights a week over a month's time) (Roth, 2007).

Individuals who do rotating shift work are also likely to experience disruptions in circadian cycles. Rotating shift work refers to a work schedule that changes from early to late on a daily or weekly basis. For example, a person may work from 7:00 a.m. to 3:00 p.m. on Monday, 3:00 a.m. to 11:00 a.m. on Tuesday, and 11:00 a.m. to 7:00 p.m. on Wednesday. In such instances, the individual's schedule changes so frequently that it becomes difficult for a normal circadian rhythm to be maintained. This often results in sleeping problems, and it can lead to signs of depression and anxiety. These kinds of schedules are common for individuals working in health care professions and service industries, and they are associated with persistent feelings of exhaustion and agitation that can make someone more prone to making mistakes on the job (Gold et al., 1992; Presser, 1995).

Rotating shift work has pervasive effects on the lives and experiences of individuals engaged in that kind of work, which is clearly illustrated in stories reported in a qualitative study that researched the experiences of middle-aged nurses who worked rotating shifts (West, Boughton, & Byrnes, 2009). Several of the nurses interviewed commented that their work schedules affected their relationships with their families. One of the nurses said,

If you've had a partner who does work regular job 9 to 5 office hours . . . the ability to spend time, good time with them when you're not feeling absolutely exhausted . . . that would be one of the problems that I've encountered.
(West et al., 2009, p. 114)

While disruptions in circadian rhythms can have negative consequences, there are things we can do to help us realign our biological clocks with the external environment. Some of these approaches, such as using a

bright light as shown in the image below, have been shown to alleviate some of the problems experienced by individuals suffering from jet lag or from the consequences of rotating shift work. Because the biological clock is driven by light, exposure to bright light during working shifts and dark exposure when not working can help combat insomnia and symptoms of anxiety and depression (Huang, Tsai, Chen, & Hsu, 2013).



Devices like this are designed to provide exposure to bright light to help people maintain a regular circadian cycle. They can be helpful for people working night shifts or for people affected by seasonal variations in light.

Watch this video to hear tips on how to overcome jet lag: [6 Tips To Beat Jet Lag](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=314#oembed-2>

Insufficient Sleep

When people have difficulty getting sleep due to their work or the demands of day-to-day life, they accumulate a sleep debt. A person with a sleep debt does not get sufficient sleep on a chronic basis. The consequences of

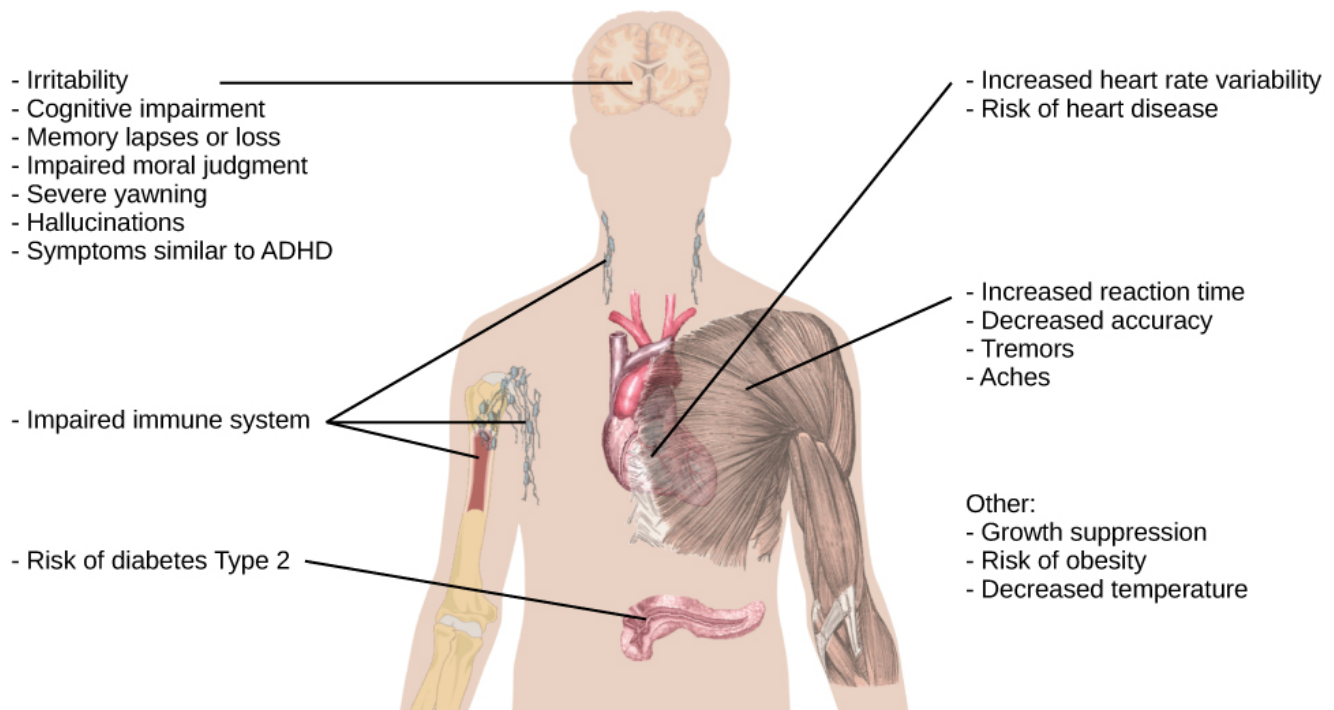
sleep debt include decreased levels of alertness and mental efficiency. Interestingly, since the advent of electric light, the amount of sleep that people get has declined. While we certainly welcome the convenience of having the darkness lit up, we also suffer the consequences of reduced amounts of sleep because we are more active during the nighttime hours than our ancestors were. As a result, many of us sleep less than 7–8 hours a night and accrue a sleep debt. While there is tremendous variation in any given individual's sleep needs, the National Sleep Foundation (n.d.) cites research to estimate that newborns require the most sleep (between 12 and 18 hours a night) and that this amount declines to just 7–9 hours by the time we are adults.

If you lie down to take a nap and fall asleep very easily, chances are you may have sleep debt. Given that college students are notorious for suffering from significant sleep debt (Hicks, Fernandez, & Pelligrini, 2001; Hicks, Johnson, & Pelligrini, 1992; Miller, Shattuck, & Matsangas, 2010), chances are you and your classmates deal with sleep debt-related issues on a regular basis. The chart below shows recommended amounts of sleep at different ages.

Sleep Needs at Different Ages

Age	Nightly Sleep Needs
0–3 months	12–18 hours
3 months–1 year	14–15 hours
1–3 years	12–14 hours
3–5 years	11–13 hours
5–10 years	10–11 hours
10–18 years	8–10 hours
18 and older	7–9 hours

Sleep debt and sleep deprivation have significant negative psychological and physiological consequences. As mentioned earlier, lack of sleep can result in decreased mental alertness and cognitive function. In addition, sleep deprivation often results in depression-like symptoms. These effects can occur as a function of accumulated sleep debt or in response to more acute periods of sleep deprivation. It may surprise you to know that sleep deprivation is associated with obesity, increased blood pressure, increased levels of stress hormones, and reduced immune functioning (Banks & Dinges, 2007). A sleep-deprived individual generally will fall asleep more quickly than if she were not sleep-deprived. Some sleep-deprived individuals have difficulty staying awake when they stop moving (for example, while sitting and watching television or driving a car). That is why individuals suffering from sleep deprivation can also put themselves and others at risk when they put themselves behind the wheel of a car or work with dangerous machinery. Some research suggests that sleep deprivation affects cognitive and motor function as much as, if not more than, alcohol intoxication (Williamson & Feyer, 2000).



This figure illustrates some of the negative consequences of sleep deprivation. While cognitive deficits may be the most obvious, many body systems are negatively impacted by lack of sleep. (credit: modification of work by Mikael Häggström)

To assess your own sleeping habits, read this article about sleep needs: [How Much Sleep Do We Really Need?](#)

The amount of sleep we get varies across the lifespan. When we are very young, we spend up to 16 hours a day sleeping. As we grow older, we sleep less. In fact, a meta-analysis, which is a study that combines the results of many related studies, conducted within the last decade indicates that by the time we are 65 years old, we average fewer than 7 hours of sleep per day (Ohayon, Carskadon, Guilleminault, & Vitiello, 2004). As the amount of time we sleep varies over our lifespan, presumably the sleep debt would adjust accordingly.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=314#h5p-82>

Summary

States of consciousness vary over the course of the day and throughout our lives. Important factors in these changes are the biological rhythms, and, more specifically, the circadian rhythms generated by the suprachiasmatic nucleus (SCN). Typically, our biological clocks are aligned with our external environment, and light tends to be an important cue in setting this clock. When people travel across multiple time zones or work rotating shifts, they can experience disruptions of their circadian cycles that can lead to insomnia, sleepiness, and decreased alertness. Bright light therapy has shown to be promising in dealing with circadian disruptions. If people go extended periods of time without sleep, they will accrue a sleep debt and potentially experience a number of adverse psychological and physiological consequences.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=314#h5p-83>

Critical Thinking Questions

Healthcare professionals often work rotating shifts. Why is this problematic? What can be done to deal with potential problems?

Given that rotating shift work can lead to exhaustion and decreased mental efficiency, individuals working under these conditions are more likely to make mistakes on the job. The implications for this in the health care professions are obvious. Those in health care professions could be educated about the benefits of light-dark exposure to help alleviate such problems.

Generally, humans are considered diurnal which means we are awake during the day and asleep during the night. Many rodents, on the other hand, are nocturnal. Why do you think different animals have such different sleep-wake cycles?

Different species have different evolutionary histories, and they have adapted to their environments in different ways. There are a number of different possible explanations as to why a given species is diurnal or nocturnal. Perhaps humans would be most vulnerable to threats during the evening hours when light levels are low. Therefore, it might make sense to be in shelter during this time. Rodents, on the other hand, are faced with a number of predatory threats, so perhaps being active at night minimizes the risk from predators such as birds that use their visual senses to locate prey.

Personal Application Questions

We experience shifts in our circadian clocks in the fall and spring of each year with time changes associated with daylight saving time. Is springing ahead or falling back easier for you to adjust to, and why do you think that is?

What do you do to adjust to the differences in your daily schedule throughout the week? Are you running a sleep debt when daylight saving time begins or ends?

16.

WHY WE SLEEP

Learning Objectives

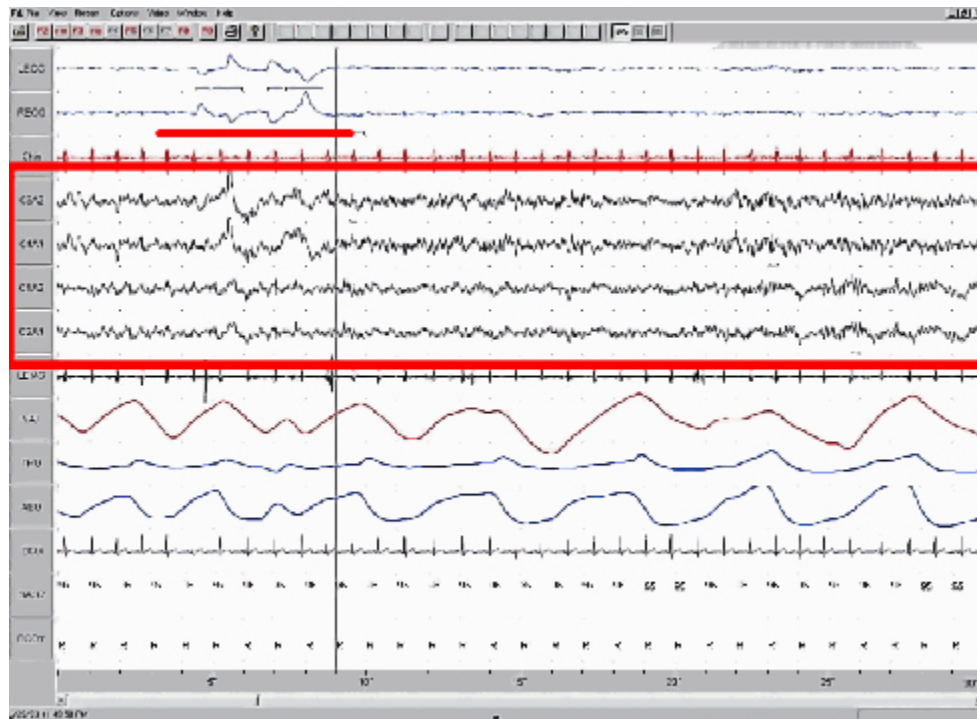
By the end of this section, you will be able to:

- Describe areas of the brain involved in sleep
- Understand hormone secretions associated with sleep
- Describe several theories aimed at explaining the function of sleep

We spend approximately one-third of our lives sleeping. Given the average life expectancy for U.S. citizens falls between 73 and 79 years old (Singh & Siahpush, 2006), we can expect to spend approximately 25 years of our lives sleeping. Some animals never sleep (e.g., several fish and amphibian species); other animals can go extended periods of time without sleep and without apparent negative consequences (e.g., dolphins); yet some animals (e.g., rats) die after two weeks of sleep deprivation (Siegel, 2008). Why do we devote so much time to sleeping? Is it absolutely essential that we sleep? This section will consider these questions and explore various explanations for why we sleep.

What is Sleep?

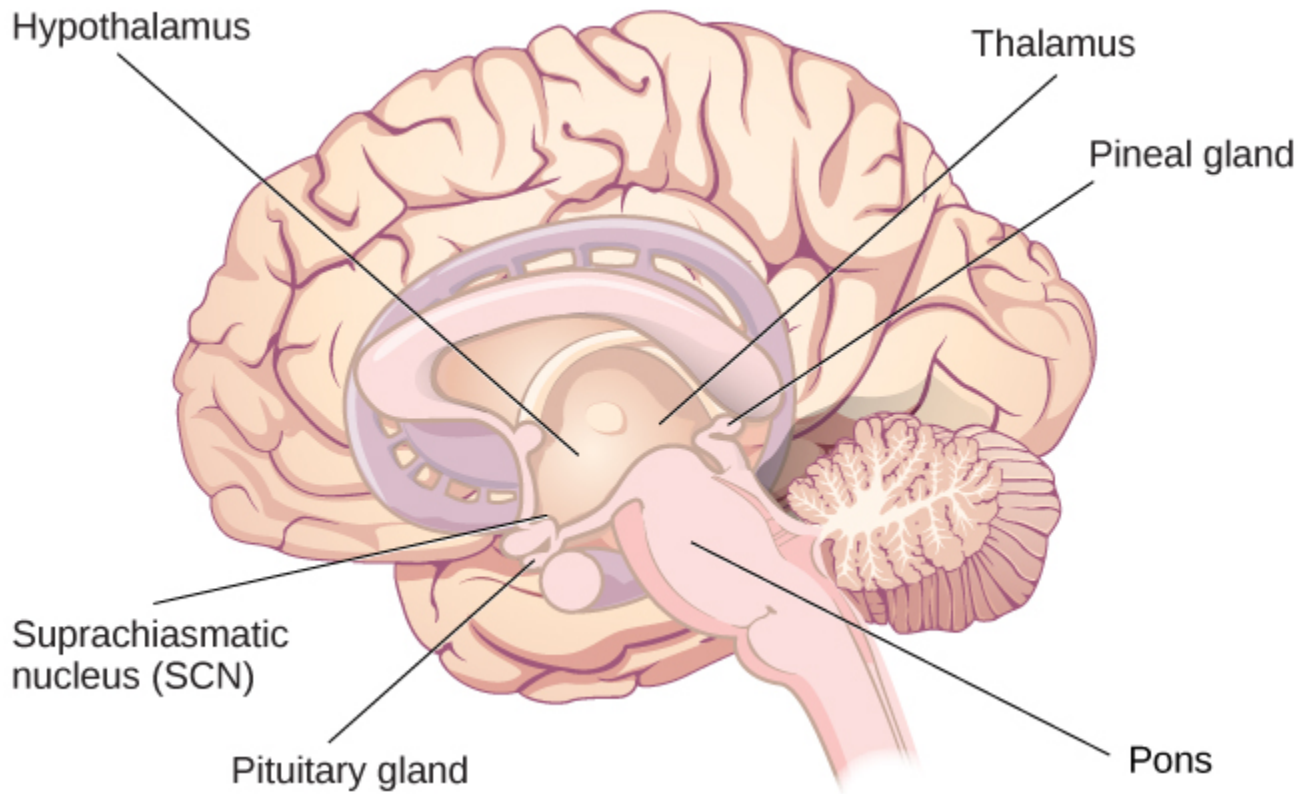
You have read that sleep is distinguished by low levels of physical activity and reduced sensory awareness. As discussed by Siegel (2008), a definition of sleep must also include mention of the interplay of the circadian and homeostatic mechanisms that regulate sleep. Homeostatic regulation of sleep is evidenced by sleep rebound following sleep deprivation. Sleep rebound refers to the fact that a sleep-deprived individual will tend to take a shorter time to fall asleep during subsequent opportunities for sleep. Sleep is characterized by certain patterns of activity of the brain that can be visualized using electroencephalography (EEG), and different phases of sleep can be differentiated using EEG as well.



This is a segment of a polysomnogram (PSG), a recording of several physical variables during sleep. The x-axis shows the passage of time in seconds; this record includes 30 seconds of data. The location of the sets of electrodes that produced each signal is labeled on the y-axis. The red box encompasses EEG output, and the waveforms are characteristic of a specific stage of sleep. Other curves show other sleep-related data, such as body temperature, muscle activity, and heartbeat.

Sleep-wake cycles seem to be controlled by multiple brain areas acting in conjunction with one another. Some of these areas include the thalamus, the hypothalamus, and the pons. As already mentioned, the hypothalamus contains the SCN—the biological clock of the body—in addition to other nuclei that, in conjunction with the thalamus, regulate slow-wave sleep. The pons is important for regulating rapid eye movement (REM) sleep (National Institutes of Health, n.d.).

Sleep is also associated with the secretion and regulation of a number of hormones from several endocrine glands including: melatonin, follicle-stimulating hormone (FSH), luteinizing hormone (LH), and growth hormone (National Institutes of Health, n.d.). You have read that the pineal gland releases melatonin during sleep. Melatonin is thought to be involved in the regulation of various biological rhythms and the immune system (Hardeland et al., 2006). During sleep, the pituitary gland secretes both FSH and LH which are important in regulating the reproductive system (Christensen et al., 2012; Sofikitis et al., 2008). The pituitary gland also secretes growth hormone, during sleep, which plays a role in physical growth and maturation as well as other metabolic processes (Bartke, Sun, & Longo, 2013).



The pineal and pituitary glands secrete a number of hormones during sleep.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=316#h5p-85>

Why Do We Sleep?

Given the central role that sleep plays in our lives and the number of adverse consequences that have been

associated with sleep deprivation, one would think that we would have a clear understanding of why it is that we sleep. Unfortunately, this is not the case; however, several hypotheses have been proposed to explain the function of sleep.

Adaptive Function of Sleep

One popular hypothesis of sleep incorporates the perspective of evolutionary psychology. Evolutionary psychology is a discipline that studies how universal patterns of behavior and cognitive processes have evolved over time as a result of natural selection. Variations and adaptations in cognition and behavior make individuals more or less successful in reproducing and passing their genes to their offspring. One hypothesis from this perspective might argue that sleep is essential to restore resources that are expended during the day. Just as bears hibernate in the winter when resources are scarce, perhaps people sleep at night to reduce their energy expenditures. While this is an intuitive explanation of sleep, there is little research that supports this explanation. In fact, it has been suggested that there is no reason to think that energetic demands could not be addressed with periods of rest and inactivity (Frank, 2006; Rial et al., 2007), and some research has actually found a negative correlation between energetic demands and the amount of time spent sleeping (Capellini, Barton, McNamara, Preston, & Nunn, 2008).

Another evolutionary hypothesis of sleep holds that our sleep patterns evolved as an adaptive response to predatory risks, which increase in darkness. Thus we sleep in safe areas to reduce the chance of harm. Again, this is an intuitive and appealing explanation for why we sleep. Perhaps our ancestors spent extended periods of time asleep to reduce attention to themselves from potential predators. Comparative research indicates, however, that the relationship that exists between predatory risk and sleep is very complex and equivocal. Some research suggests that species that face higher predatory risks sleep fewer hours than other species (Capellini et al., 2008), while other researchers suggest there is no relationship between the amount of time a given species spends in deep sleep and its predation risk (Lesku, Roth, Amlaner, & Lima, 2006).

It is quite possible that sleep serves no single universally adaptive function, and different species have evolved different patterns of sleep in response to their unique evolutionary pressures. While we have discussed the negative outcomes associated with sleep deprivation, it should be pointed out that there are many benefits that are associated with adequate amounts of sleep. A few such benefits listed by the National Sleep Foundation (n.d.) include maintaining healthy weight, lowering stress levels, improving mood, and increasing motor coordination, as well as a number of benefits related to cognition and memory formation.

Cognitive Function of Sleep

Another theory regarding why we sleep involves sleep's importance for cognitive function and memory formation (Rattenborg, Lesku, Martinez-Gonzalez, & Lima, 2007). Indeed, we know sleep deprivation results

in disruptions in cognition and memory deficits (Brown, 2012), leading to impairments in our abilities to maintain attention, make decisions, and recall long-term memories. Moreover, these impairments become more severe as the amount of sleep deprivation increases (Alhola & Polo-Kantola, 2007). Furthermore, slow-wave sleep after learning a new task can improve resultant performance on that task (Huber, Ghilardi, Massimini, & Tononi, 2004) and seems essential for effective memory formation (Stickgold, 2005). Understanding the impact of sleep on cognitive function should help you understand that cramming all night for a test may be not effective and can even prove counterproductive.

Watch this brief video describing sleep deprivation in college students: [Sleep Deprivation Among College Students](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=316#oembed-1>

Sleep has also been associated with other cognitive benefits. Research indicates that included among these possible benefits are increased capacities for creative thinking (Cai, Mednick, Harrison, Kanady, & Mednick, 2009; Wagner, Gais, Haider, Verleger, & Born, 2004), language learning (Fenn, Nusbaum, & Margoliash, 2003; Gómez, Bootzin, & Nadel, 2006), and inferential judgments (Ellenbogen, Hu, Payne, Titone, & Walker, 2007). It is possible that even the processing of emotional information is influenced by certain aspects of sleep (Walker, 2009).

Watch this brief video describing the relationship between sleep and memory: [The Connection between Memory and Sleep – Science Nation](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=316#oembed-2>

Summary

We devote a very large portion of time to sleep, and our brains have complex systems that control various aspects of sleep. Several hormones important for physical growth and maturation are secreted during sleep. While the reason we sleep remains something of a mystery, there is some evidence to suggest that sleep is very important to learning and memory.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=316#h5p-86>

Critical Thinking Questions

If theories that assert sleep is necessary for restoration and recovery from daily energetic demands are correct, what do you predict about the relationship that would exist between individuals' total sleep duration and their level of activity?

Those individuals (or species) that expend the greatest amounts of energy would require the longest periods of sleep.

How could researchers determine if given areas of the brain are involved in the regulation of sleep?

Researchers could use lesion or brain stimulation techniques to determine how deactivation or

activation of a given brain region affects behavior. Furthermore, researchers could use any number of brain imaging techniques like fMRI or CT scans to come to these conclusions.

Differentiate the evolutionary theories of sleep and make a case for the one with the most compelling evidence.

One evolutionary theory of sleep holds that sleep is essential for restoration of resources that are expended during the demands of day-to-day life. A second theory proposes that our sleep patterns evolved as an adaptive response to predatory risks, which increase in darkness. The first theory has little or no empirical support, and the second theory is supported by some, though not all, research.

Personal Application Question

Have you (or someone you know) ever experienced significant periods of sleep deprivation because of simple insomnia, high levels of stress, or as a side effect of a medication? What were the consequences of missing out on sleep?

17.

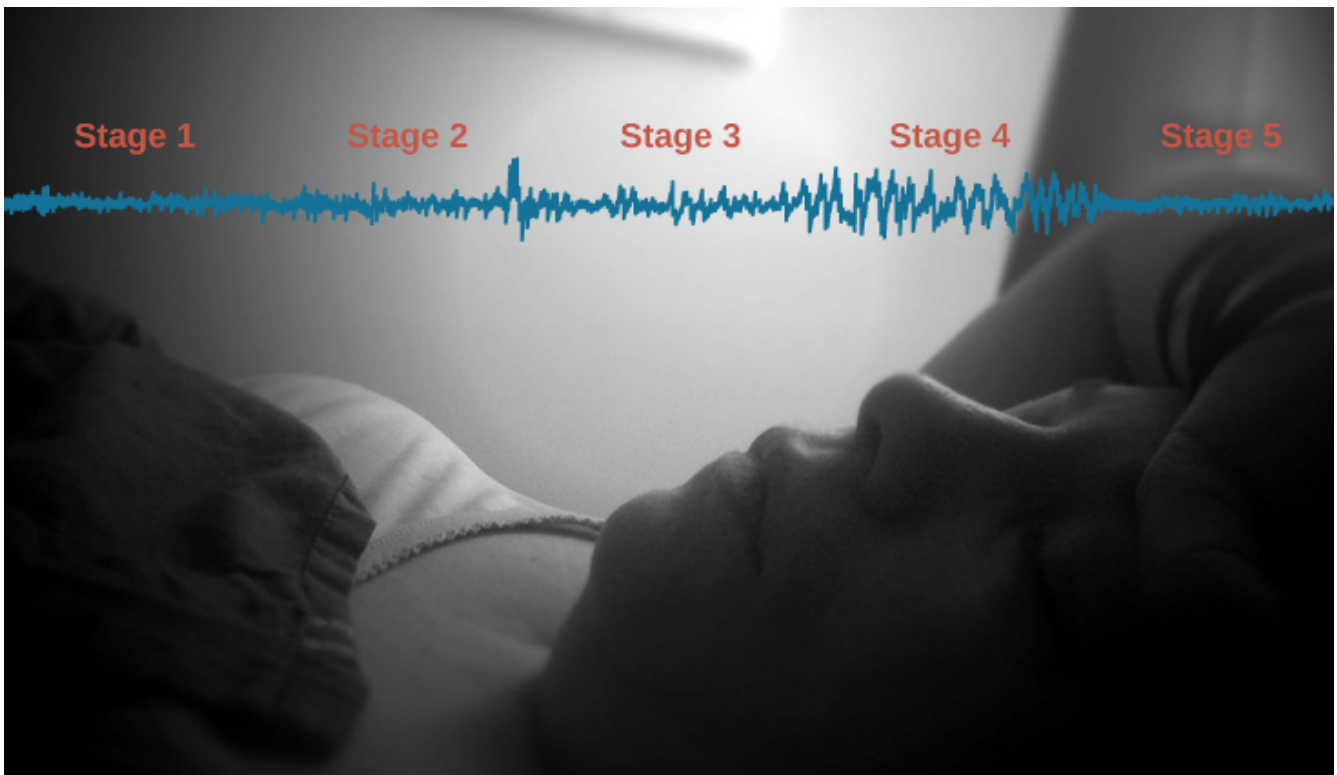
STAGES OF SLEEP

Learning Objectives

By the end of this section, you will be able to:

- Differentiate between REM and non-REM sleep
- Describe the differences between the four stages of non-REM sleep
- Understand the roles that REM and non-REM sleep play in learning and memory

Sleep is not a uniform state of being. Instead, sleep is composed of several different stages that can be differentiated from one another by the patterns of brain wave activity that occur during each stage. These changes in brain wave activity can be visualized using EEG and are distinguished from one another by both the frequency and amplitude of brain waves. Sleep can be divided into two different general phases: REM sleep and non-REM (NREM) sleep. **Rapid eye movement (REM) sleep** is characterized by darting movements of the eyes under closed eyelids. Brain waves during REM sleep appear very similar to brain waves during wakefulness. In contrast, non-REM (NREM) sleep is subdivided into four stages distinguished from each other and from wakefulness by characteristic patterns of brain waves. The first four stages of sleep are NREM sleep, while the fifth and final stage of sleep is REM sleep. In this section, we will discuss each of these stages of sleep and their associated patterns of brain wave activity.

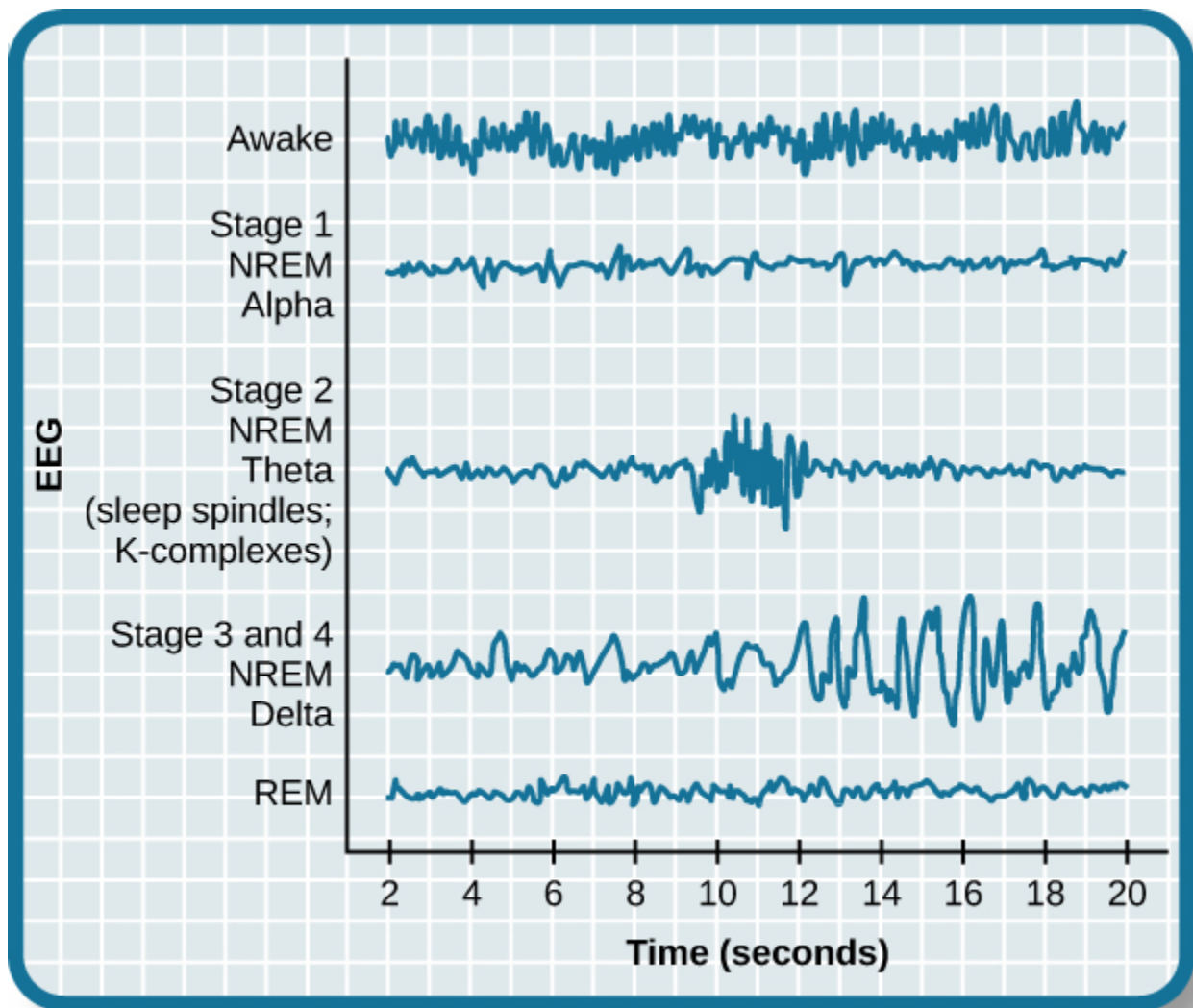


Brainwave activity changes dramatically across the different stages of sleep. (credit “sleeping”: modification of work by Ryan Vaarsi)

NREM Stages of Sleep

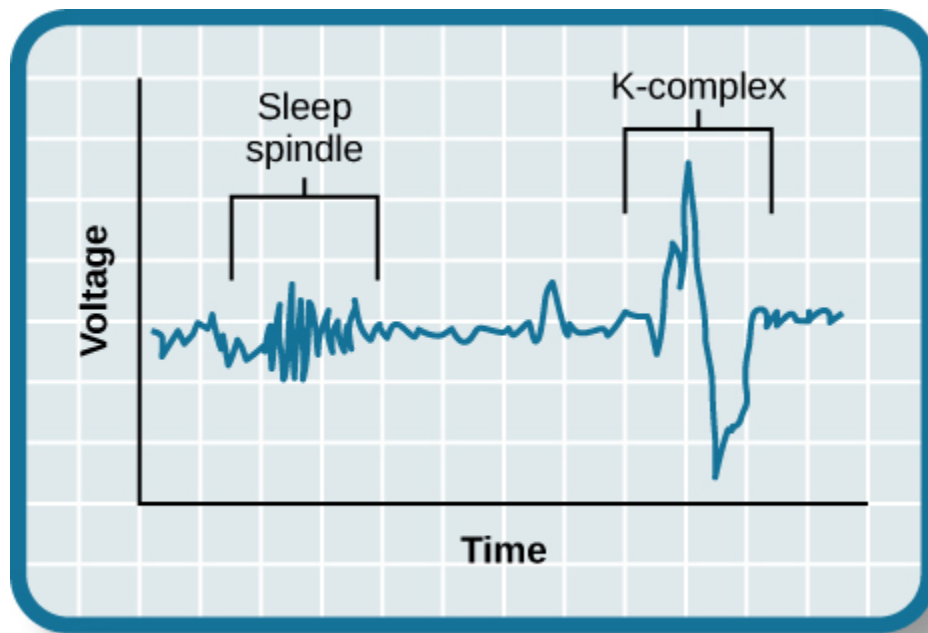
The first stage of NREM sleep is known as stage 1 sleep. Stage 1 sleep is a transitional phase that occurs between wakefulness and sleep, the period during which we drift off to sleep. During this time, there is a slowdown in both the rates of respiration and heartbeat. In addition, stage 1 sleep involves a marked decrease in both overall muscle tension and core body temperature.

In terms of brain wave activity, stage 1 sleep is associated with both alpha and theta waves. The early portion of stage 1 sleep produces alpha waves, which are relatively low frequency (8–13Hz), high amplitude patterns of electrical activity (waves) that become synchronized. This pattern of brain wave activity resembles that of someone who is very relaxed, yet awake. As an individual continues through stage 1 sleep, there is an increase in theta wave activity. Theta waves are even lower frequency (4–7 Hz), higher amplitude brain waves than alpha waves. It is relatively easy to wake someone from stage 1 sleep; in fact, people often report that they have not been asleep if they are awoken during stage 1 sleep.



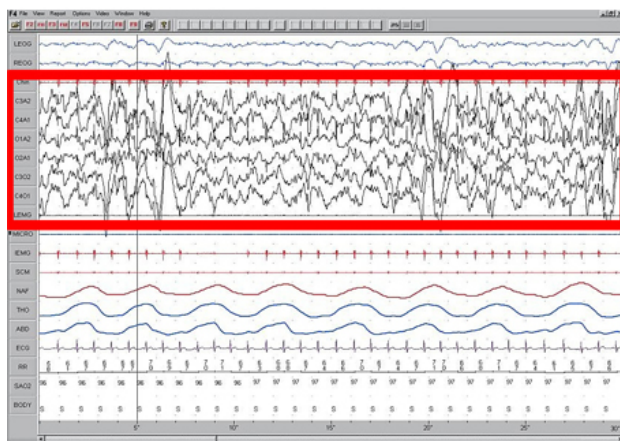
Brainwave activity changes dramatically across the different stages of sleep.

As we move into stage 2 sleep, the body goes into a state of deep relaxation. Theta waves still dominate the activity of the brain, but they are interrupted by brief bursts of activity known as sleep spindles. A sleep spindle is a rapid burst of higher-frequency brain waves that may be important for learning and memory (Fogel & Smith, 2011; Poe, Walsh, & Bjorness, 2010). In addition, the appearance of K-complexes is often associated with stage 2 sleep. A K-complex is a very high amplitude pattern of brain activity that may in some cases occur in response to environmental stimuli. Thus, K-complexes might serve as a bridge to higher levels of arousal in response to what is going on in our environments (Halász, 1993; Steriade & Amzica, 1998).

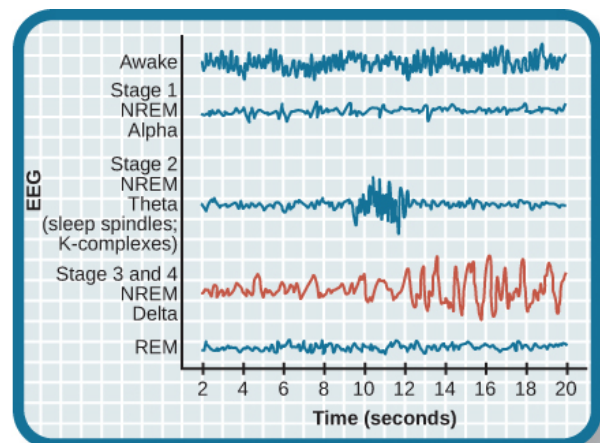


Stage 2 sleep is characterized by the appearance of both sleep spindles and K-complexes.

Stage 3 and stage 4 of sleep are often referred to as deep sleep or slow-wave sleep because these stages are characterized by low frequency (up to 4 Hz), high amplitude delta waves. During this time, an individual's heart rate and respiration slow dramatically. It is much more difficult to awaken someone from sleep during stage 3 and stage 4 than during earlier stages. Interestingly, individuals who have increased levels of alpha brain wave activity (more often associated with wakefulness and transition into stage 1 sleep) during stage 3 and stage 4 often report that they do not feel refreshed upon waking, regardless of how long they slept (Stone, Taylor, McCrae, Kalsekar, & Lichstein, 2008).



(a)

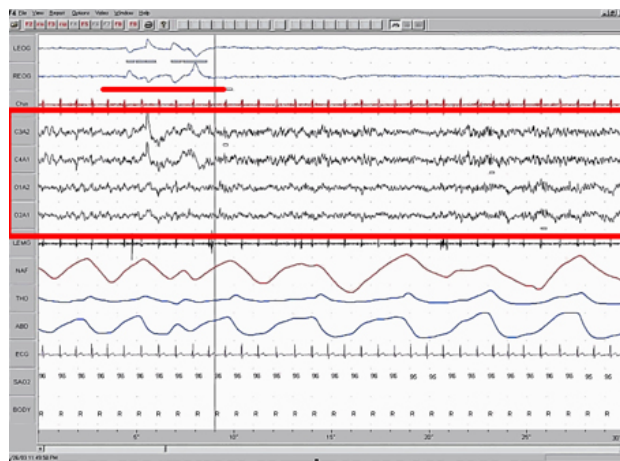


(b)

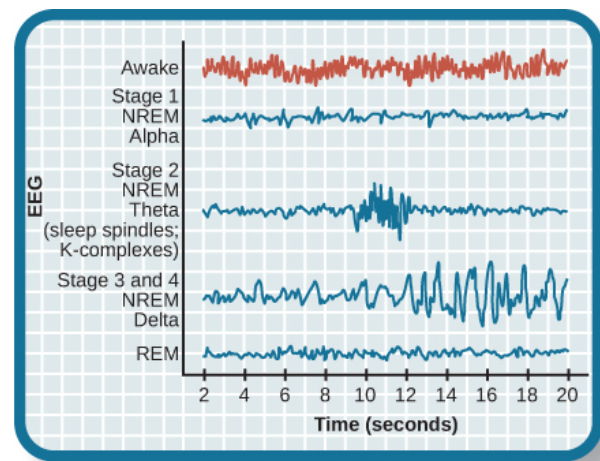
(a) Delta waves, which are low frequency and high amplitude, characterize (b) slow-wave stage 3 and stage 4 sleep.

REM Sleep

As mentioned earlier, REM sleep is marked by rapid movements of the eyes. The brain waves associated with this stage of sleep are very similar to those observed when a person is awake, as shown in, and this is the period of sleep in which dreaming occurs. It is also associated with paralysis of muscle systems in the body with the exception of those that make circulation and respiration possible. Therefore, no movement of voluntary muscles occurs during REM sleep in a normal individual; REM sleep is often referred to as **paradoxical sleep** because of this combination of high brain activity and lack of muscle tone. Like NREM sleep, REM has been implicated in various aspects of learning and memory (Wagner, Gais, & Born, 2001), although there is disagreement within the scientific community about how important both NREM and REM sleep are for normal learning and memory (Siegel, 2001).



(a)



(b)

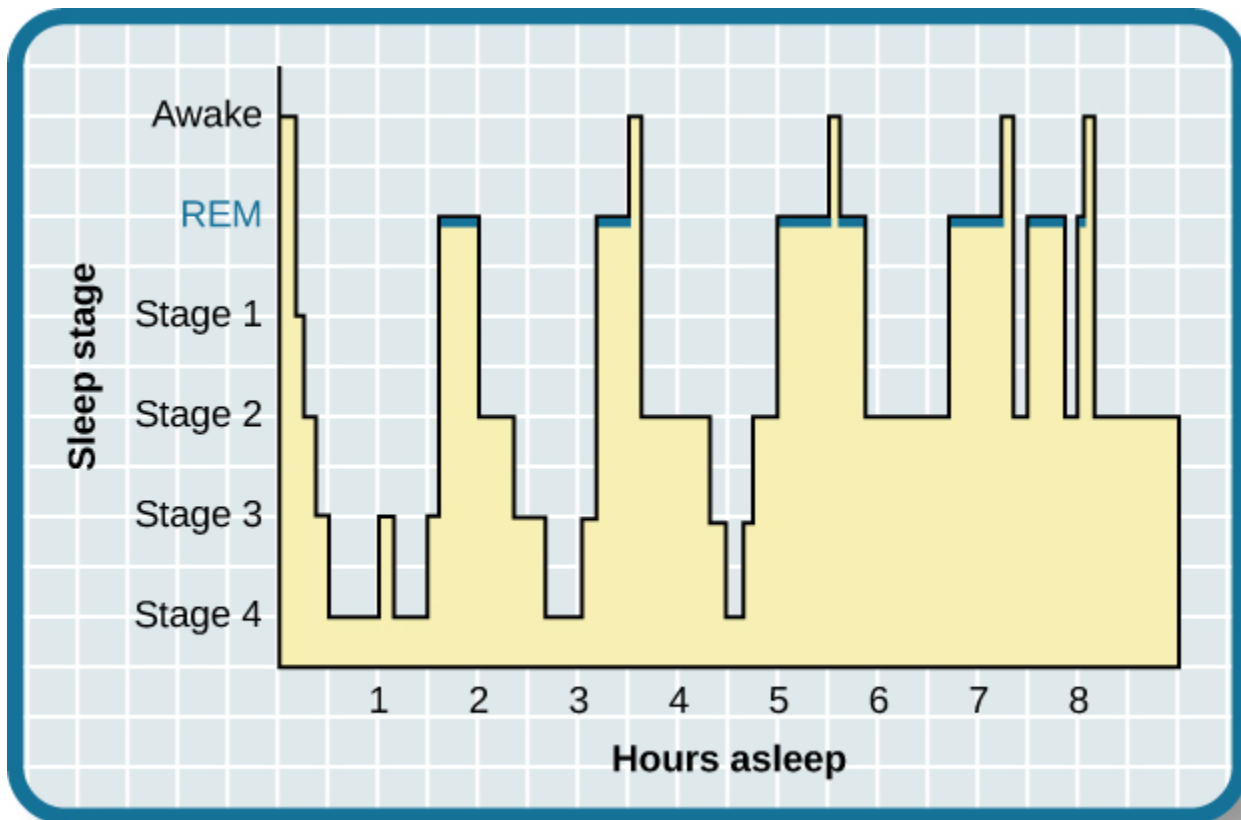
(a) A period of rapid eye movement is marked by the short red line segment. The brain waves associated with REM sleep, outlined in the red box in (a), look very similar to those seen (b) during wakefulness.

If people are deprived of REM sleep and then allowed to sleep without disturbance, they will spend more time in REM sleep in what would appear to be an effort to recoup the lost time in REM. This is known as the REM rebound, and it suggests that REM sleep is also homeostatically regulated. Aside from the role that REM sleep may play in processes related to learning and memory, REM sleep may also be involved in emotional processing and regulation. In such instances, REM rebound may actually represent an adaptive response to stress in nondepressed individuals by suppressing the emotional salience of aversive events that occurred in wakefulness (Suchecki, Tiba, & Machado, 2012).

While sleep deprivation in general is associated with a number of negative consequences (Brown, 2012), the consequences of REM deprivation appear to be less profound (as discussed in Siegel, 2001). In fact, some have suggested that REM deprivation can actually be beneficial in some circumstances. For instance, REM sleep deprivation has been demonstrated to improve symptoms of people suffering from major depression,

and many effective antidepressant medications suppress REM sleep (Riemann, Berger, & Volderholzer, 2001; Vogel, 1975).

It should be pointed out that some reviews of the literature challenge this finding, suggesting that sleep deprivation that is not limited to REM sleep is just as effective or more effective at alleviating depressive symptoms among some patients suffering from depression. In either case, why sleep deprivation improves the mood of some patients is not entirely understood (Giedke & Schwärzler, 2002). Recently, however, some have suggested that sleep deprivation might change emotional processing so that various stimuli are more likely to be perceived as positive in nature (Gujar, Yoo, Hu, & Walker, 2011). The hypnogram below shows a person's passage through the stages of sleep.



A hypnogram is a diagram of the stages of sleep as they occur during a period of sleep. This hypnogram illustrates how an individual moves through the various stages of sleep.

Dreams

The meaning of dreams varies across different cultures and periods of time. By the late 19th century, German psychiatrist Sigmund Freud had become convinced that dreams represented an opportunity to gain access to the unconscious. By analyzing dreams, Freud thought people could increase self-awareness and gain valuable insight to help them deal with the problems they faced in their lives. Freud made distinctions between the

manifest content and the latent content of dreams. Manifest content is the actual content, or storyline, of a dream. Latent content, on the other hand, refers to the hidden meaning of a dream. For instance, if a woman dreams about being chased by a snake, Freud might have argued that this represents the woman's fear of sexual intimacy, with the snake serving as a symbol of a man's penis.

Freud was not the only theorist to focus on the content of dreams. The 20th-century Swiss psychiatrist Carl Jung believed that dreams allowed us to tap into the collective unconscious. The collective unconscious, as described by Jung, is a theoretical repository of information he believed to be shared by everyone. According to Jung, certain symbols in dreams reflected universal archetypes with meanings that are similar for all people regardless of culture or location.

The sleep and dreaming researcher Rosalind Cartwright, however, believes that dreams simply reflect life events that are important to the dreamer. Unlike Freud and Jung, Cartwright's ideas about dreaming have found empirical support. For example, she and her colleagues published a study in which women going through divorce were asked several times over a five-month period to report the degree to which their former spouses were on their minds. These same women were awakened during REM sleep in order to provide a detailed account of their dream content. There was a significant positive correlation between the degree to which women thought about their former spouses during waking hours and the number of times their former spouses appeared as characters in their dreams (Cartwright, Agargun, Kirkby, & Friedman, 2006). Recent research (Horikawa, Tamaki, Miyawaki, & Kamitani, 2013) has uncovered new techniques by which researchers may effectively detect and classify the visual images that occur during dreaming by using fMRI for neural measurement of brain activity patterns, opening the way for additional research in this area.

Recently, neuroscientists have also become interested in understanding why we dream. For example, Hobson (2009) suggests that dreaming may represent a state of protoconsciousness. In other words, dreaming involves constructing a virtual reality in our heads that we might use to help us during wakefulness. Among a variety of neurobiological evidence, John Hobson cites research on lucid dreams as an opportunity to better understand dreaming in general. Lucid dreams are dreams in which certain aspects of wakefulness are maintained during a dream state. In a lucid dream, a person becomes aware of the fact that they are dreaming, and as such, they can control the dream's content (LaBerge, 1990).

Summary

The different stages of sleep are characterized by the patterns of brain waves associated with each stage. As a person transitions from being awake to falling asleep, alpha waves are replaced by theta waves. Sleep spindles and K-complexes emerge in stage 2 sleep. Stage 3 and stage 4 are described as slow-wave sleep that is marked by a predominance of delta waves. REM sleep involves rapid movements of the eyes, paralysis of voluntary muscles, and dreaming. Both NREM and REM sleep appear to play important roles in learning and memory. Dreams

may represent life events that are important to the dreamer. Alternatively, dreaming may represent a state of protoconsciousness, or a virtual reality, in the mind that helps a person during consciousness.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=318#h5p-89>

Critical Thinking Questions

Freud believed that dreams provide important insight into the unconscious mind. He maintained that a dream's manifest content could provide clues into an individual's unconscious. What potential criticisms exist for this particular perspective?

The subjective nature of dream analysis is one criticism. Psychoanalysts are charged with helping their clients interpret the true meaning of a dream. There is no way to refute or confirm whether or not these interpretations are accurate. The notion that "sometimes a cigar is just a cigar" (sometimes attributed to Freud but not definitively shown to be his) makes it clear that there is no systematic, objective system in place for dream analysis.

Some people claim that sleepwalking and talking in your sleep involve individuals acting out their dreams. Why is this particular explanation unlikely?

Dreaming occurs during REM sleep. One of the hallmarks of this particular stage of sleep is the paralysis of the voluntary musculature which would make acting out dreams improbable.

Personal Application Question

Researchers believe that one important function of sleep is to facilitate learning and memory. How does

knowing this help you in your college studies? What changes could you make to your study and sleep habits to maximize your mastery of the material covered in class?

18.

SLEEP PROBLEMS AND DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Describe the symptoms and treatments of insomnia
- Recognize the symptoms of several parasomnias
- Describe the symptoms and treatments for sleep apnea
- Recognize risk factors associated with sudden infant death syndrome (SIDS) and steps to prevent it
- Describe the symptoms and treatments for narcolepsy

Many people experience disturbances in their sleep at some point in their lives. Depending on the population and sleep disorder being studied, between 30% and 50% of the population suffers from a sleep disorder at some point in their lives (Bixler, Kales, Soldatos, Kales, & Healey, 1979; Hossain & Shapiro, 2002; Ohayon, 1997, 2002; Ohayon & Roth, 2002). This section will describe several sleep disorders as well as some of their treatment options.

Insomnia

Insomnia, a consistent difficulty in falling or staying asleep, is the most common of the sleep disorders. Individuals with insomnia often experience long delays between the times that they go to bed and actually fall asleep. In addition, these individuals may wake up several times during the night only to find that they have difficulty getting back to sleep. As mentioned earlier, one of the criteria for insomnia involves experiencing these symptoms for at least three nights a week for at least one month's time (Roth, 2007).

It is not uncommon for people suffering from insomnia to experience increased levels of anxiety about

their inability to fall asleep. This becomes a self-perpetuating cycle because increased anxiety leads to increased arousal, and higher levels of arousal make the prospect of falling asleep even more unlikely. Chronic insomnia is almost always associated with feeling overtired and may be associated with symptoms of depression.

There may be many factors that contribute to insomnia, including age, drug use, exercise, mental status, and bedtime routines. Not surprisingly, insomnia treatment may take one of several different approaches. People who suffer from insomnia might limit their use of stimulant drugs (such as caffeine) or increase their amount of physical exercise during the day. Some people might turn to over-the-counter (OTC) or prescribed sleep medications to help them sleep, but this should be done sparingly because many sleep medications result in dependence and alter the nature of the sleep cycle, and they can increase insomnia over time. Those who continue to have insomnia, particularly if it affects their quality of life, should seek professional treatment.

Some forms of psychotherapy, such as cognitive-behavioral therapy, can help sufferers of insomnia. Cognitive-behavioral therapy is a type of psychotherapy that focuses on cognitive processes and problem behaviors. The treatment of insomnia likely would include stress management techniques and changes in problematic behaviors that could contribute to insomnia (e.g., spending more waking time in bed). Cognitive-behavioral therapy has been demonstrated to be quite effective in treating insomnia (Savard, Simard, Ivers, & Morin, 2005; Williams, Roth, Vathauer, & McCrae, 2013).

Parasomnias

A parasomnia is one of a group of sleep disorders in which unwanted, disruptive motor activity and/or experiences during sleep play a role. Parasomnias can occur in either REM or NREM phases of sleep. Sleepwalking, restless leg syndrome, and night terrors are all examples of parasomnias (Mahowald & Schenck, 2000).

Sleepwalking

In sleepwalking, or somnambulism, the sleeper engages in relatively complex behaviors ranging from wandering about to driving an automobile. During periods of sleepwalking, sleepers often have their eyes open, but they are not responsive to attempts to communicate with them. Sleepwalking most often occurs during slow-wave sleep, but it can occur at any time during a sleep period in some affected individuals (Mahowald & Schenck, 2000).

Historically, somnambulism has been treated with a variety of pharmacotherapies ranging from benzodiazepines to antidepressants. However, the success rate of such treatments is questionable. Guilleminault et al. (2005) found that sleepwalking was not alleviated with the use of benzodiazepines. However, all of their somnambulistic patients who also suffered from sleep-related breathing problems showed a marked decrease in sleepwalking when their breathing problems were effectively treated.

A Sleepwalking Defense?

On January 16, 1997, Scott Falater sat down to dinner with his wife and children and told them about difficulties he was experiencing on a project at work. After dinner, he prepared some materials to use in leading a church youth group the following morning, and then he attempted to repair the family's swimming pool pump before retiring to bed. The following morning, he awoke to barking dogs and unfamiliar voices from downstairs. As he went to investigate what was going on, he was met by a group of police officers who arrested him for the murder of his wife (Cartwright, 2004; CNN, 1999).

Yarmila Falater's body was found in the family's pool with 44 stab wounds. A neighbor called the police after witnessing Falater standing over his wife's body before dragging her into the pool. Upon a search of the premises, police found blood-stained clothes and a bloody knife in the trunk of Falater's car, and he had blood stains on his neck.

Remarkably, Falater insisted that he had no recollection of hurting his wife in any way. His children and his wife's parents all agreed that Falater had an excellent relationship with his wife and they couldn't think of a reason that would provide any sort of motive to murder her (Cartwright, 2004).

Scott Falater had a history of regular episodes of sleepwalking as a child, and he had even behaved violently toward his sister once when she tried to prevent him from leaving their home in his pajamas during a sleepwalking episode. He suffered from no apparent anatomical brain anomalies or psychological disorders. It appeared that Scott Falater had killed his wife in his sleep, or at least, that is the defense he used when he was tried for his wife's murder (Cartwright, 2004; CNN, 1999). In Falater's case, a jury found him guilty of first-degree murder in June of 1999 (CNN, 1999); however, there are other murder cases where the sleepwalking defense has been used successfully. As scary as it sounds, many sleep researchers believe that homicidal sleepwalking is possible in individuals suffering from the types of sleep disorders described below (Broughton et al., 1994; Cartwright, 2004; Mahowald, Schenck, & Cramer Bornemann, 2005; Pressman, 2007).

REM Sleep Behavior Disorder (RBD)

REM sleep behavior disorder (RBD) occurs when the muscle paralysis associated with the REM sleep phase does not occur. Individuals who suffer from RBD have high levels of physical activity during REM sleep,

especially during disturbing dreams. These behaviors vary widely, but they can include kicking, punching, scratching, yelling, and behaving like an animal that has been frightened or attacked. People who suffer from this disorder can injure themselves or their sleeping partners when engaging in these behaviors. Furthermore, these types of behaviors ultimately disrupt sleep, although affected individuals have no memories that these behaviors have occurred (Arnulf, 2012).

This disorder is associated with a number of neurodegenerative diseases such as Parkinson's disease. In fact, this relationship is so robust that some view the presence of RBD as a potential aid in the diagnosis and treatment of a number of neurodegenerative diseases (Ferini-Strambi, 2011). Clonazepam, an anti-anxiety medication with sedative properties, is most often used to treat RBD. It is administered alone or in conjunction with doses of melatonin (the hormone secreted by the pineal gland). As part of treatment, the sleeping environment is often modified to make it a safer place for those suffering from RBD (Zangini, Calandra-Buonaura, Grimaldi, & Cortelli, 2011).

Other Parasomnias

A person with restless leg syndrome has uncomfortable sensations in the legs during periods of inactivity or when trying to fall asleep. This discomfort is relieved by deliberately moving the legs, which, not surprisingly, contributes to difficulty in falling or staying asleep. Restless leg syndrome is quite common and has been associated with a number of other medical diagnoses, such as chronic kidney disease and diabetes (Mahowald & Schenck, 2000). There are a variety of drugs that treat restless leg syndrome: benzodiazepines, opiates, and anticonvulsants (Restless Legs Syndrome Foundation, n.d.).

Night terrors result in a sense of panic in the sufferer and are often accompanied by screams and attempts to escape from the immediate environment (Mahowald & Schenck, 2000). Although individuals suffering from night terrors appear to be awake, they generally have no memories of the events that occurred, and attempts to console them are ineffective. Typically, individuals suffering from night terrors will fall back asleep again within a short time. Night terrors apparently occur during the NREM phase of sleep (Provini, Tinuper, Bisulli, & Lagaresi, 2011). Generally, treatment for night terrors is unnecessary unless there is some underlying medical or psychological condition that is contributing to the night terrors (Mayo Clinic, n.d.).

Sleep Apnea

Sleep apnea is defined by episodes during which a sleeper's breathing stops. These episodes can last 10–20 seconds or longer and often are associated with brief periods of arousal. While individuals suffering from sleep apnea may not be aware of these repeated disruptions in sleep, they do experience increased levels of fatigue. Many individuals diagnosed with sleep apnea first seek treatment because their sleeping partners indicate that they snore loudly and/or stop breathing for extended periods of time while sleeping (Henry & Rosenthal,

2013). Sleep apnea is much more common in overweight people and is often associated with loud snoring. Surprisingly, sleep apnea may exacerbate cardiovascular disease (Sánchez-de-la-Torre, Campos-Rodriguez, & Barbé, 2012). While sleep apnea is less common in thin people, anyone, regardless of their weight, who snores loudly or gasps for air while sleeping, should be checked for sleep apnea.

While people are often unaware of their sleep apnea, they are keenly aware of some of the adverse consequences of insufficient sleep. Consider a patient who believed that as a result of his sleep apnea he “had three car accidents in six weeks. They were ALL my fault. Two of them I didn’t even know I was involved in until afterwards” (Henry & Rosenthal, 2013, p. 52). It is not uncommon for people suffering from undiagnosed or untreated sleep apnea to fear that their careers will be affected by the lack of sleep, illustrated by this statement from another patient, “I’m in a job where there’s a premium on being mentally alert. I was really sleepy... and having trouble concentrating.... It was getting to the point where it was kind of scary” (Henry & Rosenthal, 2013, p. 52).

There are two types of sleep apnea: obstructive sleep apnea and central sleep apnea. Obstructive sleep apnea occurs when an individual’s airway becomes blocked during sleep, and air is prevented from entering the lungs. In central sleep apnea, disruption in signals sent from the brain that regulate breathing causes periods of interrupted breathing (White, 2005).

One of the most common treatments for sleep apnea involves the use of a special device during sleep. A continuous positive airway pressure (CPAP) device includes a mask that fits over the sleeper’s nose and mouth, which is connected to a pump that pumps air into the person’s airways, forcing them to remain open, as shown in. Some newer CPAP masks are smaller and cover only the nose. This treatment option has proven to be effective for people suffering from mild to severe cases of sleep apnea (McDaid et al., 2009). However, alternative treatment options are being explored because consistent compliance by users of CPAP devices is a problem. Recently, a new EPAP (expiratory positive air pressure) device has shown promise in double-blind trials as one such alternative (Berry, Kryger, & Massie, 2011).



(a)



(b)

(a) A typical CPAP device used in the treatment of sleep apnea is (b) affixed to the head with straps, and a mask that covers the nose and mouth.

SIDS

In sudden infant death syndrome (SIDS) an infant stops breathing during sleep and dies. Infants younger than 12 months appear to be at the highest risk for SIDS, and boys have a greater risk than girls. A number of risk factors have been associated with SIDS including premature birth, smoking within the home, and hyperthermia. There may also be differences in both brain structure and function in infants who die from SIDS (Berkowitz, 2012; Mage & Donner, 2006; Thach, 2005).

The substantial amount of research on SIDS has led to a number of recommendations to parents to protect their children. For one, research suggests that infants should be placed on their backs when put down to sleep, and their cribs should not contain any items that pose suffocation threats, such as blankets, pillows, or padded crib bumpers (cushions that cover the bars of a crib). Infants should not have caps placed on their heads when put down to sleep in order to prevent overheating, and people in the child's household should abstain from smoking in the home. Recommendations like these have helped to decrease the number of infant deaths from SIDS in recent years (Mitchell, 2009; Task Force on Sudden Infant Death Syndrome, 2011).



The Safe to Sleep campaign educates the public about how to minimize risk factors associated with SIDS. This campaign is sponsored in part by the National Institute of Child Health and Human Development.

Narcolepsy

Unlike the other sleep disorders described in this section, a person with narcolepsy cannot resist falling asleep at inopportune times. These sleep episodes are often associated with cataplexy, which is a lack of muscle tone or muscle weakness, and in some cases involves complete paralysis of the voluntary muscles. This is similar to the kind of paralysis experienced by healthy individuals during REM sleep (Burgess & Scammell, 2012; Hishikawa & Shimizu, 1995; Luppi et al., 2011). Narcoleptic episodes take on other features of REM sleep. For example, around one-third of individuals diagnosed with narcolepsy experience vivid, dream-like hallucinations during narcoleptic attacks (Chokroverty, 2010).

Surprisingly, narcoleptic episodes are often triggered by states of heightened arousal or stress. The typical episode can last from a minute or two to half an hour. Once awakened from a narcoleptic attack, people report that they feel refreshed (Chokroverty, 2010). Obviously, regular narcoleptic episodes could interfere with the ability to perform one's job or complete schoolwork, and in some situations, narcolepsy can result in significant harm and injury (e.g., driving a car or operating machinery or other potentially dangerous equipment).

Generally, narcolepsy is treated using psychomotor stimulant drugs, such as amphetamines (Mignot, 2012). These drugs promote increased levels of neural activity. Narcolepsy is associated with reduced levels of the signaling molecule hypocretin in some areas of the brain (De la Herrán-Arita & Drucker-Colín, 2012; Han, 2012), and the traditional stimulant drugs do not have direct effects on this system. Therefore, it is quite likely that new medications that are developed to treat narcolepsy will be designed to target the hypocretin system.

There is a tremendous amount of variability among sufferers, both in terms of how symptoms of narcolepsy manifest and the effectiveness of currently available treatment options. This is illustrated by McCarty's (2010) case study of a 50-year-old woman who sought help for the excessive sleepiness during normal waking hours that she had experienced for several years. She indicated that she had fallen asleep at inappropriate or dangerous times, including while eating, while socializing with friends, and while driving her car. During periods of emotional arousal, the woman complained that she felt some weakness in the right side of her body. Although

she did not experience any dream-like hallucinations, she was diagnosed with narcolepsy as a result of sleep testing. In her case, the fact that her cataplexy was confined to the right side of her body was quite unusual. Early attempts to treat her condition with a stimulant drug alone were unsuccessful. However, when a stimulant drug was used in conjunction with a popular antidepressant, her condition improved dramatically.

Summary

Many individuals suffer from some type of sleep disorder or disturbance at some point in their lives. Insomnia is a common experience in which people have difficulty falling or staying asleep. Parasomnias involve unwanted motor behavior or experiences throughout the sleep cycle and include RBD, sleepwalking, restless leg syndrome, and night terrors. Sleep apnea occurs when individuals stop breathing during their sleep, and in the case of sudden infant death syndrome, infants will stop breathing during sleep and die. Narcolepsy involves an irresistible urge to fall asleep during waking hours and is often associated with cataplexy and hallucination.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=320#h5p-92>

Critical Thinking Questions

One of the recommendations that therapists will make to people who suffer from insomnia is to spend less waking time in bed. Why do you think spending waking time in bed might interfere with the ability to fall asleep later?

Answers will vary. One possible explanation might invoke principles of associative learning. If the bed represents a place for socializing, studying, eating, and so on, then it is possible that it

will become a place that elicits higher levels of arousal, which would make falling asleep at the appropriate time more difficult. Answers could also consider self-perpetuating cycle referred to when describing insomnia. If an individual is having trouble falling asleep and that generates anxiety, it might make sense to remove him from the context where sleep would normally take place to try to avoid anxiety being associated with that context.

How is narcolepsy with cataplexy similar to and different from REM sleep? Similarities include muscle atony and the hypnagogic hallucinations associated with narcoleptic episodes. The differences involve the uncontrollable nature of narcoleptic attacks and the fact that these come on in situations that would normally not be associated with sleep of any kind (e.g., instances of heightened arousal or emotionality).

Personal Application Question

What factors might contribute to your own experiences with insomnia?

19.

SUBSTANCE USE AND ABUSE

Learning Objectives

By the end of this section, you will be able to:

- Describe the diagnostic criteria for substance use disorders
- Identify the neurotransmitter systems affected by various categories of drugs
- Describe how different categories of drugs affect behavior and experience

While we all experience altered states of consciousness in the form of sleep on a regular basis, some people use drugs and other substances that result in altered states of consciousness as well. This section will present information relating to the use of various psychoactive drugs and problems associated with such use. This will be followed by brief descriptions of the effects of some of the more well-known drugs commonly used today.

Substance Use Disorders

The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5) is used by clinicians to diagnose individuals suffering from various psychological disorders. Drug use disorders are addictive disorders, and the criteria for specific substance (drug) use disorders are described in DSM-5. A person who has a substance use disorder often uses more of the substance than they originally intended to and continues to use that substance despite experiencing significant adverse consequences. In individuals diagnosed with a substance use disorder, there is a compulsive pattern of drug use that is often associated with both physical and psychological dependence.

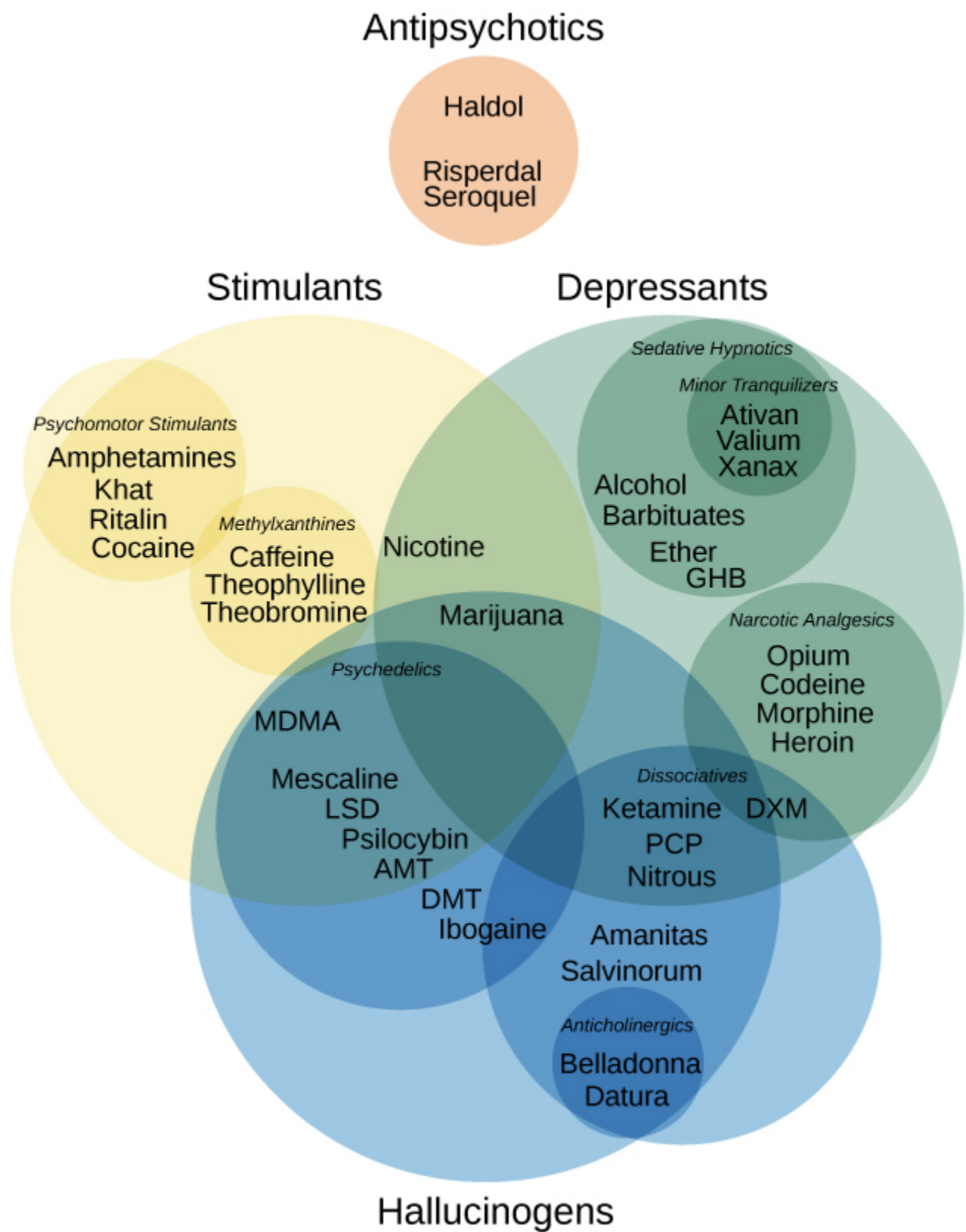
Physical dependence involves changes in normal bodily functions—the user will experience withdrawal from the drug upon cessation of use. In contrast, a person who has **psychological dependence** has an emotional, rather than physical, need for the drug and may use the drug to relieve psychological distress.

Tolerance is linked to physiological dependence, and it occurs when a person requires more and more of a drug to achieve effects previously experienced at lower doses. Tolerance can cause the user to increase the amount of a drug used to a dangerous level—even to the point of overdose and death.

Drug withdrawal includes a variety of negative symptoms experienced when drug use is discontinued. These symptoms are usually the opposite of the effects of the drug. For example, withdrawal from sedative drugs often produces unpleasant arousal and agitation. In addition to withdrawal, many individuals who are diagnosed with substance use disorders will also develop tolerances to these substances. Psychological dependence, or drug craving, is a recent addition to the diagnostic criteria for substance use disorder in DSM-5. This is an important factor because we can develop tolerance and experience withdrawal from any number of drugs that we do not abuse. In other words, physical dependence in and of itself is of limited utility in determining whether or not someone has a substance use disorder.

Drug Categories

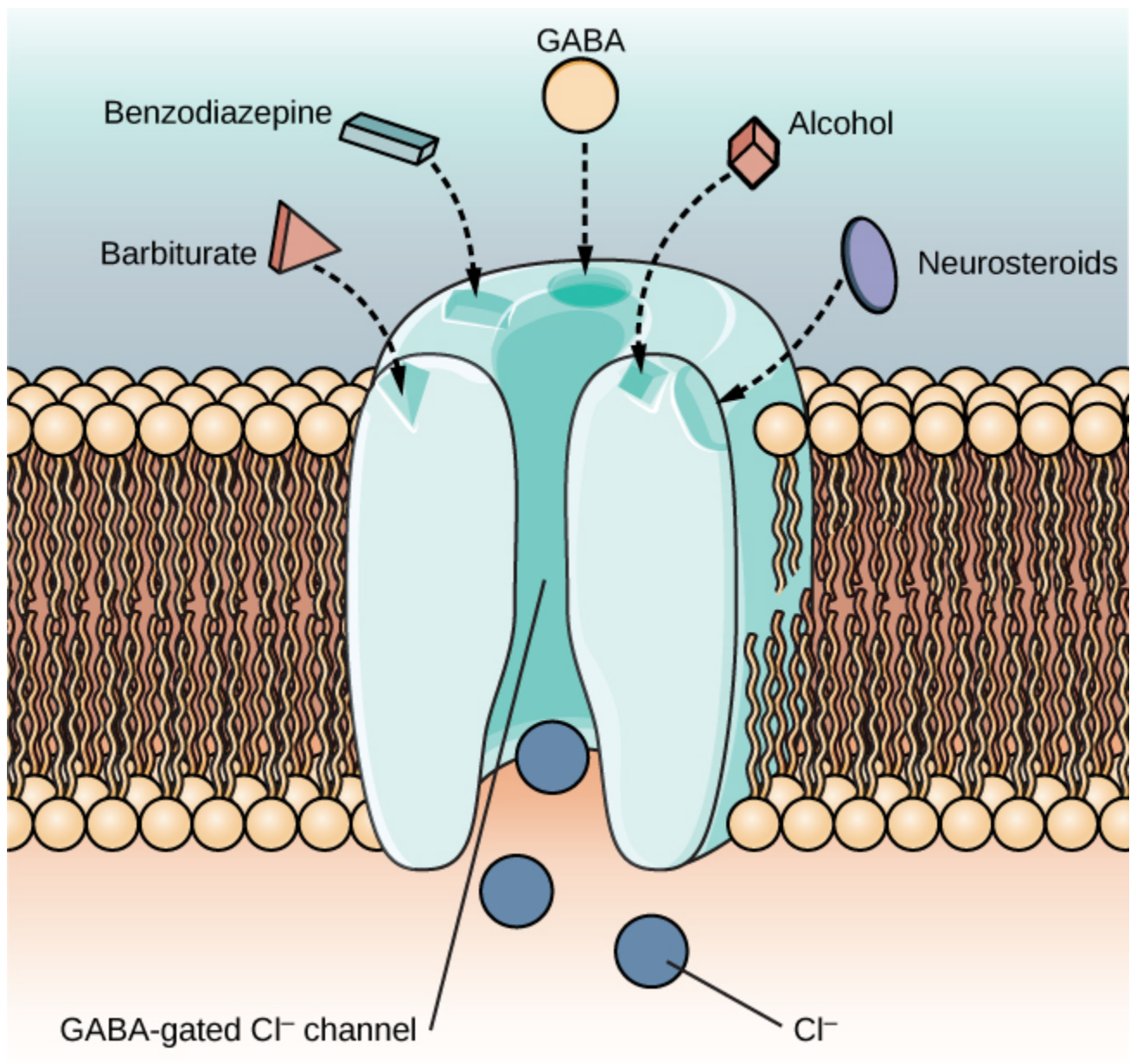
The effects of all psychoactive drugs occur through their interactions with our endogenous neurotransmitter systems. Many of these drugs, and their relationships, are shown in. As you have learned, drugs can act as agonists or antagonists of a given neurotransmitter system. An agonist facilitates the activity of a neurotransmitter system, and antagonists impede neurotransmitter activity.



This figure illustrates various drug categories and overlap among them. (credit: modification of work by Derrick Snider)

Alcohol and Other Depressants

Ethanol, which we commonly refer to as alcohol, is in a class of psychoactive drugs known as depressants. A **depressant** is a drug that tends to suppress central nervous system activity. Other depressants include barbiturates and benzodiazepines. These drugs share in common their ability to serve as agonists of the gamma-aminobutyric acid (GABA) neurotransmitter system. Because GABA has a quieting effect on the brain, GABA agonists also have a quieting effect; these types of drugs are often prescribed to treat both anxiety and insomnia.



The GABA-gated chloride (Cl⁻) channel is embedded in the cell membrane of certain neurons. The channel has multiple receptor sites where alcohol, barbiturates, and benzodiazepines bind to exert their effects. The binding of these molecules opens the chloride channel, allowing negatively charged chloride ions (Cl⁻) into the neuron's cell body. Changing its charge in a negative direction pushes the neuron away from firing; thus, activating a GABA neuron has a quieting effect on the brain.

Acute alcohol administration results in a variety of changes to consciousness. At rather low doses, alcohol use is associated with feelings of euphoria. As the dose increases, people report feeling sedated. Generally, alcohol is associated with decreases in reaction time and visual acuity, lowered levels of alertness, and a reduction in behavioral control. With excessive alcohol use, a person might experience a complete loss of consciousness and/or difficulty remembering events that occurred during a period of intoxication (McKim & Hancock, 2013). In

addition, if a pregnant woman consumes alcohol, her infant may be born with a cluster of birth defects and symptoms collectively called **fetal alcohol spectrum disorder (FASD) or fetal alcohol syndrome (FAS)**.

With repeated use of many central nervous system depressants, such as alcohol, a person becomes physically dependent upon the substance and will exhibit signs of both tolerance and withdrawal. Psychological dependence on these drugs is also possible. Therefore, the abuse potential of central nervous system depressants is relatively high.

Drug withdrawal is usually an aversive experience, and it can be a life-threatening process in individuals who have a long history of very high doses of alcohol and/or barbiturates. This is of such concern that people who are trying to overcome addiction to these substances should only do so under medical supervision.

Stimulants

Stimulants are drugs that tend to increase overall levels of neural activity. Many of these drugs act as agonists of the dopamine neurotransmitter system. Dopamine activity is often associated with reward and craving; therefore, drugs that affect dopamine neurotransmission often have abuse liability. Drugs in this category include cocaine, amphetamines (including methamphetamine), cathinones (i.e., bath salts), MDMA (ecstasy), nicotine, and caffeine.

Cocaine can be taken in multiple ways. While many users snort cocaine, intravenous injection and ingestion are also common. The freebase version of cocaine, known as crack, is a potent, smokable version of the drug. Like many other stimulants, cocaine agonizes the dopamine neurotransmitter system by blocking the reuptake of dopamine in the neuronal synapse.

CRACK COCAINE

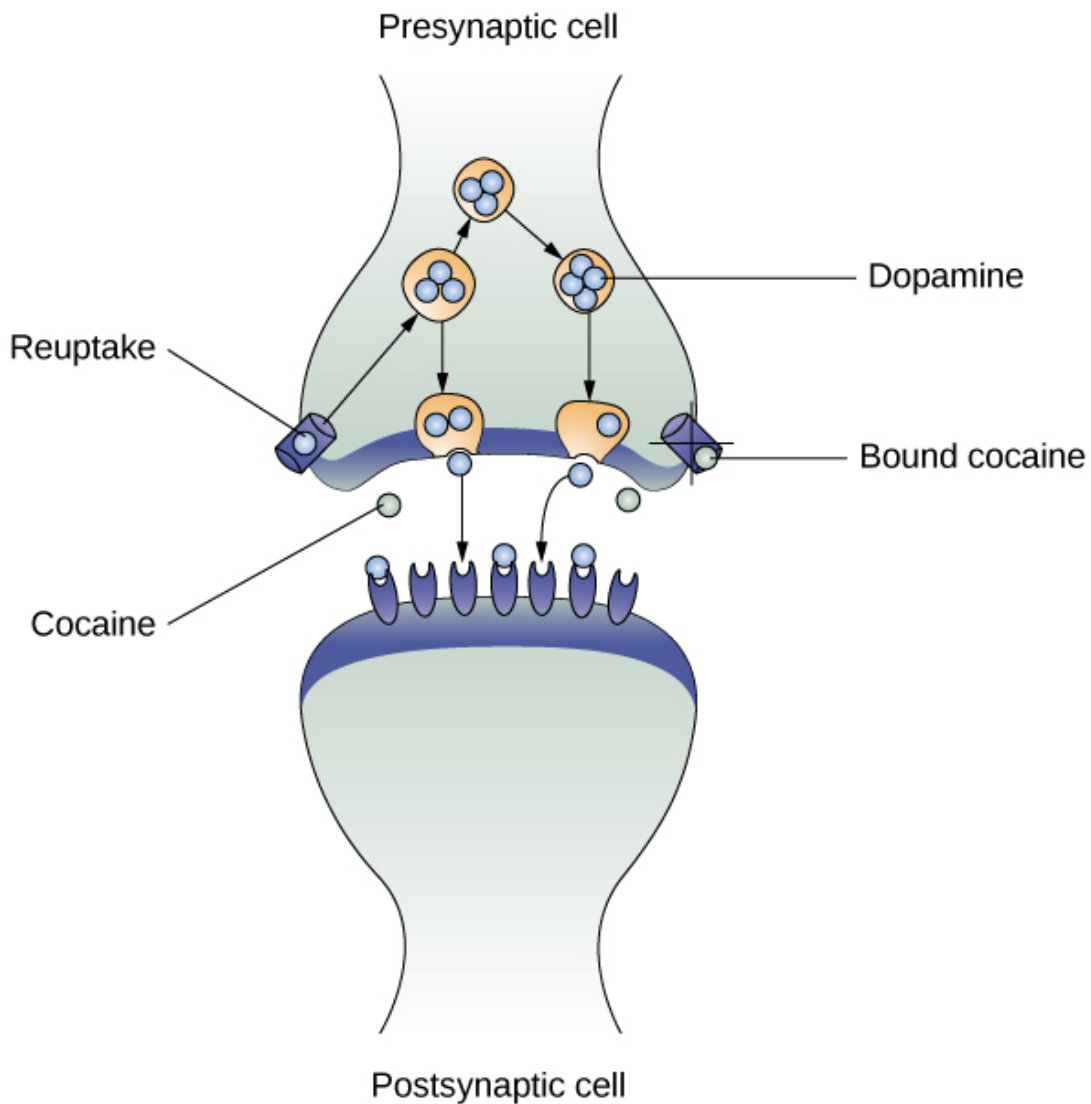
Crack is often considered to be more addictive than cocaine itself because it is smokable and reaches the brain very quickly. Crack is often less expensive than other forms of cocaine; therefore, it tends to be a more accessible drug for individuals from impoverished segments of society. During the 1980s, many drug laws were rewritten to punish crack users more severely than cocaine users. This led to discriminatory sentencing with low-income, inner-city minority populations receiving the harshest punishments. The wisdom of these laws has recently been called into question, especially given research that suggests crack may not be more addictive than other forms of cocaine, as previously thought (Haasen & Krausz, 2001; Reinerman, 2007).



Crack rocks like these are smoked to achieve a high. Compared with other routes of administration, smoking a drug allows it to enter the brain more rapidly, which can often enhance the user's experience. (credit: modification of work by U.S. Department of Justice)

Read this interesting newspaper article describing myths about crack cocaine: [5 Myths About That Demon Crack](#).

Amphetamines have a mechanism of action quite similar to cocaine in that they block the reuptake of dopamine in addition to stimulating its release. While amphetamines are often abused, they are also commonly prescribed to children diagnosed with attention deficit hyperactivity disorder (ADHD). It may seem counterintuitive that stimulant medications are prescribed to treat a disorder that involves hyperactivity, but the therapeutic effect comes from increases in neurotransmitter activity within certain areas of the brain associated with impulse control.



As one of their mechanisms of action, cocaine and amphetamines block the reuptake of dopamine from the synapse into the presynaptic cell.

In recent years, methamphetamine (meth) use has become increasingly widespread. **Methamphetamine** is a type of amphetamine that can be made from ingredients that are readily available (e.g., medications containing pseudoephedrine, a compound found in many over-the-counter cold and flu remedies). Despite recent changes in laws designed to make obtaining pseudoephedrine more difficult, methamphetamine continues to be an easily accessible and relatively inexpensive drug option (Shukla, Crump, & Chrisco, 2012).

Cocaine, amphetamine, cathinone, and MDMA users seek a euphoric high, feelings of intense elation and pleasure, especially in those users who take the drug via intravenous injection or smoking. Repeated use of these stimulants can have significant adverse consequences. Users can experience physical symptoms that include nausea, elevated blood pressure, and increased heart rate. In addition, these drugs can cause feelings of anxiety, hallucinations, and paranoia (Fiorentini et al., 2011). Normal brain functioning is altered after

repeated use of these drugs. For example, repeated use can lead to overall depletion among the monoamine neurotransmitters (dopamine, norepinephrine, and serotonin). People may engage in compulsive use of these stimulant substances in part to try to reestablish normal levels of these neurotransmitters (Jayanthi & Ramamoorthy, 2005; Rothman, Blough, & Baumann, 2007).

Caffeine is another stimulant drug. While it is probably the most commonly used drug in the world, the potency of this particular drug pales in comparison to the other stimulant drugs described in this section. Generally, people use caffeine to maintain increased levels of alertness and arousal. Caffeine is found in many common medicines (such as weight loss drugs), beverages, foods, and even cosmetics (Herman & Herman, 2013). While caffeine may have some indirect effects on dopamine neurotransmission, its primary mechanism of action involves antagonizing adenosine activity (Porkka-Heiskanen, 2011).

While caffeine is generally considered a relatively safe drug, high blood levels of caffeine can result in insomnia, agitation, muscle twitching, nausea, irregular heartbeat, and even death (Reissig, Strain, & Griffiths, 2009; Wolt, Ganetsky, & Babu, 2012). In 2012, Kromann and Nielson reported on a case study of a 40-year-old woman who suffered significant ill effects from her use of caffeine. The woman used caffeine in the past to boost her mood and to provide energy, but over the course of several years, she increased her caffeine consumption to the point that she was consuming three liters of soda each day. Although she had been taking a prescription antidepressant, her symptoms of depression continued to worsen and she began to suffer physically, displaying significant warning signs of cardiovascular disease and diabetes. Upon admission to an outpatient clinic for treatment of mood disorders, she met all of the diagnostic criteria for substance dependence and was advised to dramatically limit her caffeine intake. Once she was able to limit her use to less than 12 ounces of soda a day, both her mental and physical health gradually improved. Despite the prevalence of caffeine use and the large number of people who confess to suffering from caffeine addiction, this was the first published description of soda dependence appearing in scientific literature.

Nicotine is highly addictive, and the use of tobacco products is associated with increased risks of heart disease, stroke, and a variety of cancers. Nicotine exerts its effects through its interaction with acetylcholine receptors. Acetylcholine functions as a neurotransmitter in motor neurons. In the central nervous system, it plays a role in arousal and reward mechanisms. Nicotine is most commonly used in the form of tobacco products like cigarettes or chewing tobacco; therefore, there is a tremendous interest in developing effective smoking cessation techniques. To date, people have used a variety of nicotine replacement therapies in addition to various psychotherapeutic options in an attempt to discontinue their use of tobacco products. In general, smoking cessation programs may be effective in the short term, but it is unclear whether these effects persist (Cropley, Theadom, Pravettoni, & Webb, 2008; Levitt, Shaw, Wong, & Kaczorowski, 2007; Smedslund, Fisher, Boles, & Lichtenstein, 2004).

Opioids

An **opioid** is one of a category of drugs that includes heroin, morphine, methadone, and codeine. Opioids

have analgesic properties; that is, they decrease pain. Humans have an endogenous opioid neurotransmitter system—the body makes small quantities of opioid compounds that bind to opioid receptors reducing pain and producing euphoria. Thus, opioid drugs, which mimic this endogenous painkilling mechanism, have an extremely high potential for abuse. Natural opioids, called opiates, are derivatives of opium, which is a naturally occurring compound found in the poppy plant. There are now several synthetic versions of opiate drugs (correctly called opioids) that have very potent painkilling effects, and they are often abused. For example, the National Institute on Drug Abuse has sponsored research that suggests the misuse and abuse of the prescription painkillers hydrocodone and oxycodone are significant public health concerns (Maxwell, 2006). In 2013, the U.S. Food and Drug Administration recommended tighter controls on their medical use.

Historically, heroin has been a major opioid drug of abuse. Heroin can be snorted, smoked, or injected intravenously. Like the stimulants described earlier, the use of heroin is associated with an initial feeling of euphoria followed by periods of agitation. Because heroin is often administered via intravenous injection, users often bear needle track marks on their arms and, like all abusers of intravenous drugs, have an increased risk for contraction of both tuberculosis and HIV.



(a)



(b)

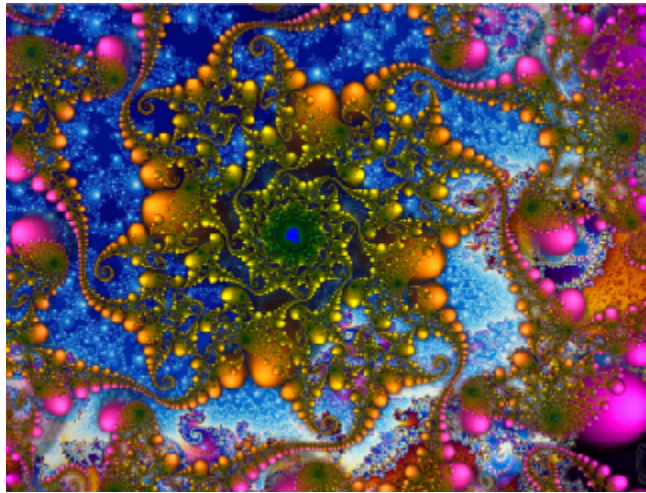
(a) Common paraphernalia for heroin preparation and use are shown here in a needle exchange kit. (b) Heroin is cooked on a spoon over a candle. (credit a: modification of work by Todd Huffman)

Aside from their utility as analgesic drugs, opioid-like compounds are often found in cough suppressants, anti-nausea, and anti-diarrhea medications. Given that withdrawal from a drug often involves an experience opposite to the effect of the drug, it should be no surprise that opioid withdrawal resembles a severe case of the flu. While opioid withdrawal can be extremely unpleasant, it is not life-threatening (Julien, 2005). Still, people experiencing opioid withdrawal may be given methadone to make withdrawal from the drug less difficult. Methadone is a synthetic opioid that is less euphorogenic than heroin and similar drugs. Methadone clinics help people who previously struggled with opioid addiction manage withdrawal symptoms through the use of methadone. Other drugs, including the opioid buprenorphine, have also been used to alleviate symptoms of opiate withdrawal.

Codeine is an opioid with relatively low potency. It is often prescribed for minor pain, and it is available over-the-counter in some other countries. Like all opioids, codeine does have abuse potential. In fact, abuse of prescription opioid medications is becoming a major concern worldwide (Aquina, Marques-Baptista, Bridgeman, & Merlin, 2009; Casati, Sedefov, & Pfeiffer-Gerschel, 2012).

Hallucinogens

A **hallucinogen** is one of a class of drugs that results in profound alterations in sensory and perceptual experiences. In some cases, users experience vivid visual hallucinations. It is also common for these types of drugs to cause hallucinations of body sensations (e.g., feeling as if you are a giant) and a skewed perception of the passage of time.



Psychedelic images like this are often associated with hallucinogenic compounds. (credit: modification of work by “new 1lluminati”/Flickr)

As a group, hallucinogens are incredibly varied in terms of the neurotransmitter systems they affect. Mescaline and LSD are serotonin agonists, and PCP (angel dust) and ketamine (an animal anesthetic) act as antagonists of the NMDA glutamate receptor. In general, these drugs are not thought to possess the same sort of abuse potential as other classes of drugs discussed in this section.

To learn more about some of the most commonly abused prescription and street drugs, check out the [Commonly Abused Drugs Chart](#) and the [Commonly Abused Prescription Drugs Chart \[PDF\]](#) from the National Institute on Drug Abuse.

Medical Marijuana

While possession and use of marijuana are illegal in most states, it is now legal in Washington and Colorado to possess limited quantities of marijuana for recreational use. In contrast, medical marijuana use is now legal in nearly half of the United States and in the District of Columbia. Medical marijuana is marijuana that is prescribed by a doctor for the treatment of a health condition. For example, people who undergo chemotherapy will often be prescribed marijuana to stimulate their appetites and prevent excessive weight loss resulting from the side effects of chemotherapy treatment. Marijuana may also have some promise in the treatment of a variety of medical conditions (Mather, Rauwendaal, Moxham-Hall, & Wodak, 2013; Robson, 2014; Schicho & Storr, 2014).



Medical marijuana shops are becoming more and more common in the United States. (credit: Laurie Avocado)

While medical marijuana laws have been passed on a state-by-state basis, federal laws still classify this as an illicit substance, making conducting research on the potentially beneficial medicinal uses of marijuana problematic. There is quite a bit of controversy within the scientific community as to the extent to which marijuana might have medicinal benefits due to a lack of large-scale, controlled research (Bostwick, 2012). As a result, many scientists have urged the federal government to allow for the relaxation of current marijuana laws and classifications in order to facilitate a more widespread study of the drug's effects (Aggarwal et al., 2009; Bostwick, 2012; Kogan & Mechoulam, 2007).

Until recently, the United States Department of Justice routinely arrested people involved and seized marijuana used in medicinal settings. In the latter part of 2013, however, the United States Department of Justice issued statements indicating that they would not continue to challenge state medical marijuana laws. This shift in policy may be in response to the scientific community's recommendations and/or reflect changing public opinion regarding marijuana.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=322#h5p-94>

Summary

Substance use disorder is defined in DSM-5 as a compulsive pattern of drug use despite negative consequences. Both physical and psychological dependence are important parts of this disorder. Alcohol, barbiturates, and benzodiazepines are central nervous system depressants that affect GABA neurotransmission. Cocaine, amphetamine, cathinones, and MDMA are all central nervous stimulants that agonize dopamine neurotransmission, while nicotine and caffeine affect acetylcholine and adenosine, respectively. Opiate drugs serve as powerful analgesics through their effects on the endogenous opioid neurotransmitter system, and hallucinogenic drugs cause pronounced changes in sensory and perceptual experiences. The hallucinogens are variable with regard to the specific neurotransmitter systems they affect.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=322#h5p-95>

Critical Thinking Questions

The negative health consequences of both alcohol and tobacco products are well-documented. A drug like marijuana, on the other hand, is generally considered to be as safe as, if not safer than, these legal drugs. Why do you think marijuana use continues to be illegal in many parts of the United States?

One possibility involves the cultural acceptance and long history of alcohol and tobacco use in our society. No doubt, money comes into play as well. Growing tobacco and producing alcohol on a large scale is a well-regulated and taxed process. Given that marijuana is essentially a weed that requires little care to grow, it would be much more difficult to regulate its production. Recent events suggest that cultural attitudes regarding marijuana are changing, and it is quite likely that its illicit status will be adapted accordingly.

Why are programs designed to educate people about the dangers of using tobacco products just as important as developing tobacco cessation programs?

Given that currently available programs designed to help people quit using tobacco products are not necessarily effective in the long term, programs designed to prevent people from using these products in the first place may be the best hope for dealing with the enormous public health concerns associated with tobacco use.

Personal Application Question

Many people experiment with some sort of psychoactive substance at some point in their lives. Why do you think people are motivated to use substances that alter consciousness?

20.

OTHER STATES OF CONSCIOUSNESS

Learning Objectives

By the end of this section, you will be able to:

- Define hypnosis and meditation
- Understand the similarities and differences between hypnosis and meditation

Our states of consciousness change as we move from wakefulness to sleep. We also alter our consciousness through the use of various psychoactive drugs. This final section will consider hypnotic and meditative states as additional examples of altered states of consciousness experienced by some individuals.

Hypnosis

Hypnosis is *a state of extreme self-focus and attention in which minimal attention is given to external stimuli*. In the therapeutic setting, a clinician may use relaxation and suggestion in an attempt to alter the thoughts and perceptions of a patient. Hypnosis has also been used to draw out information believed to be buried deeply in someone's memory. For individuals who are especially open to the power of suggestion, hypnosis can prove to be a very effective technique, and brain imaging studies have demonstrated that hypnotic states are associated with global changes in brain functioning (Del Casale et al., 2012; Guldenmund, Vanhaudenhuyse, Boly, Laureys, & Soddu, 2012).

Historically, hypnosis has been viewed with some suspicion because of its portrayal in popular media and entertainment. Therefore, it is important to make a distinction between hypnosis as an empirically based therapeutic approach versus as a form of entertainment. Contrary to popular belief, individuals undergoing hypnosis usually have clear memories of the hypnotic experience and are in control of their own behaviors.

While hypnosis may be useful in enhancing memory or a skill, such enhancements are very modest in nature (Raz, 2011).



Popular portrayals of hypnosis have led to some widely-held misconceptions.

How exactly does a hypnotist bring a participant to a state of hypnosis? While there are variations, there are four parts that appear consistent in bringing people into the state of suggestibility associated with hypnosis (National Research Council, 1994). These components include:

- The participant is guided to focus on one thing, such as the hypnotist's words or a ticking watch.
- The participant is made comfortable and is directed to be relaxed and sleepy.
- The participant is told to be open to the process of hypnosis, trust the hypnotist, and let go.
- The participant is encouraged to use his or her imagination.

These steps are conducive to being open to the heightened suggestibility of hypnosis.

People vary in terms of their ability to be hypnotized, but a review of available research suggests that

most people are at least moderately hypnotizable (Kihlstrom, 2013). Hypnosis in conjunction with other techniques is used for a variety of therapeutic purposes and has shown to be at least somewhat effective for pain management, treatment of depression and anxiety, smoking cessation, and weight loss (Alladin, 2012; Elkins, Johnson, & Fisher, 2012; Golden, 2012; Montgomery, Schnur, & Kravits, 2012).

Some scientists are working to determine whether the power of suggestion can affect cognitive processes such as learning, with a view to using hypnosis in educational settings (Wark, 2011). Furthermore, there is some evidence that hypnosis can alter processes that were once thought to be automatic and outside the purview of voluntary control, such as reading (Lifshitz, Aubert Bonn, Fischer, Kashem, & Raz, 2013; Raz, Shapiro, Fan, & Posner, 2002). However, it should be noted that others have suggested that the automaticity of these processes remains intact (Augustinova & Ferrand, 2012).

How does hypnosis work? Two theories attempt to answer this question: One theory views hypnosis as dissociation and the other theory views it as the performance of a social role. According to the dissociation view, hypnosis is effectively a dissociated state of consciousness, much like our earlier example where you may drive to work, but you are only minimally aware of the process of driving because your attention is focused elsewhere. This theory is supported by Ernest Hilgard's research into hypnosis and pain. In Hilgard's experiments, he induced participants into a state of hypnosis and placed their arms in ice water. Participants were told they would not feel pain, but they could press a button if they did; while they reported not feeling pain, they did, in fact, press the button, suggesting a dissociation of consciousness while in the hypnotic state (Hilgard & Hilgard, 1994).

Taking a different approach to explain hypnosis, the social-cognitive theory of hypnosis sees people in hypnotic states as performing the social role of a hypnotized person. As you will learn when you study social roles, people's behavior can be shaped by their expectations of how they should act in a given situation. Some view a hypnotized person's behavior not as an altered or dissociated state of consciousness, but as their fulfillment of the social expectations for that role.

Meditation

Meditation is the *act of focusing on a single target (such as the breath or a repeated sound) to increase awareness of the moment*. While hypnosis is generally achieved through the interaction of a therapist and the person being treated, an individual can perform meditation alone. Often, however, people wishing to learn to meditate receive some training in techniques to achieve a meditative state. A meditative state, as shown by EEG recordings of newly practicing meditators, is not an altered state of consciousness per se; however, patterns of brain waves exhibited by expert meditators may represent a unique state of consciousness (Fell, Axmacher, & Haupt, 2010).

Although there are a number of different techniques in use, the central feature of all meditation is clearing the mind in order to achieve a state of relaxed awareness and focus (Chen et al., 2013; Lang et al., 2012).

Mindfulness meditation has recently become popular. In the variation of meditation, the meditator's attention is focused on some internal process or an external object (Zeidan, Grant, Brown, McHaffie, & Coghill, 2012).

Meditative techniques have their roots in religious practices, but their use has grown in popularity among practitioners of alternative medicine. Research indicates that meditation may help reduce blood pressure, and the American Heart Association suggests that meditation might be used in conjunction with more traditional treatments as a way to manage hypertension, although there is not sufficient data for a recommendation to be made (Brook et al., 2013). Like hypnosis, meditation also shows promise in stress management, sleep quality (Caldwell, Harrison, Adams, Quin, & Greeson, 2010), treatment of mood and anxiety disorders (Chen et al., 2013; Freeman et al., 2010; Vøllestad, Nielsen, & Nielsen, 2012), and pain management (Reiner, Tibi, & Lipsitz, 2013).



(a)



(b)

(a) This is a statue of a meditating Buddha, representing one of the many religious traditions of which meditation plays a part. (b) People practicing meditation may experience an alternate state of consciousness. (credit a: modification of work by Jim Epler; credit b: modification of work by Caleb Roenigk)

Feeling stressed? Think meditation might help? This instructional video teaches how to use Buddhist meditation techniques to alleviate stress: [Easy Meditation for Beginners – How to do a normal Third Eye Meditation](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=324#oembed-1>

Watch this video describing the results of a brain imaging study in individuals who underwent specific mindfulness-meditative techniques: [Scans “show mindfulness meditation brain boost.”](#)

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here: <https://louis.pressbooks.pub/intropsychology/?p=324#h5p-97>

Summary

Hypnosis is a focus on the self that involves suggested changes of behavior and experience. Meditation involves relaxed, yet focused, awareness. Both hypnotic and meditative states may involve altered states of consciousness that have potential applications for the treatment of a variety of physical and psychological disorders.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=324#h5p-98>

Critical Thinking Questions

What advantages exist for researching the potential health benefits of hypnosis? Healthcare and pharmaceutical costs continue to skyrocket. If alternative approaches to dealing with these problems could be developed that would be relatively inexpensive, then the potential benefits are many.

What types of studies would be most convincing regarding the effectiveness of meditation in the treatment for some type of physical or mental disorder? Ideally, double-blind experimental trials would be best suited to speak to the effectiveness of meditation. At the very least, some sort of randomized control trial would be very informative.

Personal Application Question

Under what circumstances would you be willing to consider hypnosis and/or meditation as a treatment option? What kind of information would you need before you made a decision to use these techniques?

Media Attributions

- “[Easy Meditation for Beginners – How to do a normal Third Eye Meditation](#)” by [EasyMeditation4Beg](#).
Standard YouTube License.

21.

REFERENCES

- Aggarwal, S. K., Carter, G. T., Sullivan, M. D., ZumBrunnen, C., Morrill, R., & Mayer, J. D. (2009). Medicinal use of cannabis in the United States: Historical perspectives, current trends, and future directions. *Journal of Opioid Management*, 5, 153–168.
- Alhola, P. & Polo-Kantola, P. (2007). Sleep Deprivation: Impact on cognitive performance. *Neuropsychiatric Disease and Treatment*, 3, 553–557.
- Alladin, A. (2012). Cognitive hypnotherapy for major depressive disorder. *The American Journal of Clinical Hypnosis*, 54, 275–293.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Aquina, C. T., Marques-Baptista, A., Bridgeman, P., & Merlin, M. A. (2009). Oxycontin abuse and overdose. *Postgraduate Medicine*, 121, 163–167.
- Arnulf, I. (2012). REM sleep behavior disorder: Motor manifestations and pathophysiology. *Movement Disorders*, 27, 677–689.
- Augustinova, M., & Ferrand, L. (2012). Suggestion does not de-automatize word reading: Evidence from the semantically based Stroop task. *Psychonomic Bulletin & Review*, 19, 521–527.
- Banks, S., & Dinges, D. F. (2007). Behavioral and physiological consequences of sleep restriction. *Journal of Clinical Sleep Medicine*, 3, 519–528.
- Bartke, A., Sun, L. Y., & Longo, V. (2013). Somatotrophic signaling: Trade-offs between growth, reproductive development, and longevity. *Physiological Reviews*, 93, 571–598.
- Berkowitz, C. D. (2012). Sudden infant death syndrome, sudden unexpected infant death, and apparent life-threatening events. *Advances in Pediatrics*, 59, 183–208.
- Berry, R. B., Kryger, M. H., & Massie, C. A. (2011). A novel nasal excitatory positive airway pressure (EPAP) device for the treatment of obstructive sleep apnea: A randomized controlled trial. *Sleep*, 34, 479–485.
- Bixler, E. O., Kales, A., Soldatos, C. R., Kales, J. D., & Healey, S. (1979). Prevalence of sleep disorders in the Los Angeles metropolitan area. *American Journal of Psychiatry*, 136, 1257–1262.
- Bostwick, J. M. (2012). Blurred boundaries: The therapeutics and politics of medical marijuana. *Mayo Clinic Proceedings*, 87, 172–186.
- Brook, R. D., Appel, L. J., Rubenfire, M., Ogedegbe, G., Bisognano, J. D., Elliott, W. K., . . . Rajagopalan, S. (2013). Beyond medications and diet: Alternative approaches to lowering blood pressure: A scientific statement from the American Heart Association. *Hypertension*, 61, 1360–1383.

- Broughton, R., Billings, R., Cartwright, R., Doucette, D., Edmeads, J., Edwardh, M., . . . Turrell, G. (1994). Homicidal somnambulism: A case report. *Sleep, 17*, 253–264.
- Brown, L. K. (2012). Can sleep deprivation studies explain why human adults sleep? *Current Opinion in Pulmonary Medicine, 18*, 541–545.
- Burgess, C. R., & Scammell, T. E. (2012). Narcolepsy: Neural mechanisms of sleepiness and cataplexy. *Journal of Neuroscience, 32*, 12305–12311.
- Cai, D. J., Mednick, S. A., Harrison, E. M., Kanady, J. C., & Mednick, S. C. (2009). REM, not incubation, improves creativity by priming associative networks. *Proceedings of the National Academy of Sciences, USA, 106*, 10130–10134.
- Caldwell, K., Harrison, M., Adams, M., Quin, R. H., & Greeson, J. (2010). Developing mindfulness in college students through movement based courses: Effects on self-regulatory self-efficacy, mood, stress, and sleep quality. *Journal of American College Health, 58*, 433–442.
- Capellini, I., Barton, R. A., McNamara, P., Preston, B. T., & Nunn, C. L. (2008). Phylogenetic analysis of the ecology and evolution of mammalian sleep. *Evolution, 62*, 1764–1776.
- Cartwright, R. (2004). Sleepwalking violence: A sleep disorder, a legal dilemma, and a psychological challenge. *American Journal of Psychiatry, 161*, 1149–1158.
- Cartwright, R., Agargun, M. Y., Kirkby, J., & Friedman, J. K. (2006). Relation of dreams to waking concerns. *Psychiatry Research, 141*, 261–270.
- Casati, A., Sedefov, R., & Pfeiffer-Gerschel, T. (2012). Misuse of medications in the European Union: A systematic review of the literature. *European Addiction Research, 18*, 228–245.
- Chen, K. W., Berger, C. C., Manheimer, E., Forde, D., Magidson, J., Dachman, L., & Lejuez, C. W. (2013). Meditative therapies for reducing anxiety: A systematic review and meta-analysis of randomized controlled trials. *Depression and Anxiety, 29*, 545–562.
- Chokroverty, S. (2010). Overview of sleep & sleep disorders. *Indian Journal of Medical Research, 131*, 126–140.
- Christensen, A., Bentley, G. E., Cabrera, R., Ortega, H. H., Perfito, N., Wu, T. J., & Micevych, P. (2012). Hormonal regulation of female reproduction. *Hormone and Metabolic Research, 44*, 587–591.
- CNN. (1999, June 25). “Sleepwalker” convicted of murder. Retrieved from <http://www.cnn.com/US/9906/25/sleepwalker.01/>
- Cropley, M., Theadom, A., Pravettoni, G., & Webb, G. (2008). The effectiveness of smoking cessation interventions prior to surgery: A systematic review. *Nicotine and Tobacco Research, 10*, 407–412.
- De la Herrán-Arita, A. K., & Drucker-Colín, R. (2012). Models for narcolepsy with cataplexy drug discovery. *Expert Opinion on Drug Discovery, 7*, 155–164.
- Del Casale, A., Ferracuti, S., Rapinesi, C., Serata, D., Sani, G., Savoia, V., . . . Girardi, P. (2012). Neurocognition under hypnosis: Findings from recent functional neuroimaging studies. *International Journal of Clinical and Experimental Hypnosis, 60*, 286–317.

- Elkins, G., Johnson, A., & Fisher, W. (2012). Cognitive hypnotherapy for pain management. *The American Journal of Clinical Hypnosis*, 54, 294–310.
- Ellenbogen, J. M., Hu, P. T., Payne, J. D., Titone, D., & Walker, M. P. (2007). Human relational memory requires time and sleep. *Proceedings of the National Academy of Sciences, USA*, 104, 7723–7728.
- Fell, J., Axmacher, N., & Haupt, S. (2010). From alpha to gamma: Electrophysiological correlates meditation-related states of consciousness. *Medical Hypotheses*, 75, 218–224.
- Fenn, K. M., Nusbaum, H. C., & Margoliash, D. (2003). Consolidation during sleep of perceptual learning of spoken language. *Nature*, 425, 614–616.
- Ferini-Strambi, L. (2011). Does idiopathic REM sleep behavior disorder (iRBD) really exist? What are the potential markers of neurodegeneration in iRBD [Supplemental material]? *Sleep Medicine*, 12(2 Suppl.), S43–S49.
- Fiorentini, A., Volonteri, L.S., Dragogna, F., Rovera, C., Maffini, M., Mauri, M. C., & Altamura, C. A. (2011). Substance-induced psychoses: A critical review of the literature. *Current Drug Abuse Reviews*, 4, 228–240.
- Fogel, S. M., & Smith, C. T. (2011). The function of the sleep spindle: A physiological index of intelligence and a mechanism for sleep-dependent memory consolidation. *Neuroscience and Biobehavioral Reviews*, 35, 1154–1165.
- Frank, M. G. (2006). The mystery of sleep function: Current perspectives and future directions. *Reviews in the Neurosciences*, 17, 375–392.
- Freeman, M. P., Fava, M., Lake, J., Trivedi, M. H., Wisner, K. L., & Mischoulon, D. (2010). Complementary and alternative medicine in major depressive disorder: The American Psychiatric Association task force report. *The Journal of Clinical Psychiatry*, 71, 669–681.
- Giedke, H., & Schwärzler, F. (2002). Therapeutic use of sleep deprivation in depression. *Sleep Medicine Reviews*, 6, 361–377.
- Gold, D. R., Rogacz, S. R., Bock, N., Tosteson, T. D., Baum, T. M., Speizer, F. M., & Czeisler, C. A. (1992). Rotating shift work, sleep, and accidents related to sleepiness in hospital nurses. *American Journal of Public Health*, 82, 1011–1014.
- Golden, W. L. (2012). Cognitive hypnotherapy for anxiety disorders. *The American Journal of Clinical Hypnosis*, 54, 263–274.
- Gómez, R. L., Bootzin, R. R., & Nadel, L. (2006). Naps promote abstraction in language-learning infants. *Psychological Science*, 17, 670–674.
- Guilleminault, C., Kirisoglu, C., Bao, G., Arias, V., Chan, A., & Li, K. K. (2005). Adult chronic sleepwalking and its treatment based on polysomnography. *Brain*, 128, 1062–1069.
- Gujar, N., Yoo, S., Hu, P., & Walker, M. P. (2011). Sleep deprivation amplifies reactivity of brain reward networks, biasing the appraisal of positive emotional experiences. *The Journal of Neuroscience*, 31, 4466–4474.
- Guldenmund, P., Vanhaudenhuyse, A., Boly, M., Laureys, S., & Soddu, A. (2012). A default mode of brain function in altered states of consciousness. *Archives Italiennes de Biologie*, 150, 107–121.

- Halász, P. (1993). Arousals without awakening—Dynamic aspect of sleep. *Physiology and Behavior*, 54, 795–802.
- Han, F. (2012). Sleepiness that cannot be overcome: Narcolepsy and cataplexy. *Respirology*, 17, 1157–1165.
- Hardeland, R., Pandi-Perumal, S. R., & Cardinali, D. P. (2006). Melatonin. *International Journal of Biochemistry & Cell Biology*, 38, 313–316.
- Haasen, C., & Krausz, M. (2001). Myths versus experience with respect to cocaine and crack: Learning from the US experience. *European Addiction Research*, 7, 159–160.
- Henry, D., & Rosenthal, L. (2013). “Listening for his breath:” The significance of gender and partner reporting on the diagnosis, management, and treatment of obstructive sleep apnea. *Social Science & Medicine*, 79, 48–56.
- Hicks, R. A., Fernandez, C., & Pelligrini, R. J. (2001). The changing sleep habits of university students: An update. *Perceptual and Motor Skills*, 93, 648.
- Hicks, R. A., Johnson, C., & Pelligrini, R. J. (1992). Changes in the self-reported consistency of normal habitual sleep duration of college students (1978 and 1992). *Perceptual and Motor Skills*, 75, 1168–1170.
- Hilgard, E. R., & Hilgard, J. R. (1994). *Hypnosis in the Relief of Pain*. New York: Brunner/Mazel.
- Hishikawa, Y., & Shimizu, T. (1995). Physiology of REM sleep, cataplexy, and sleep paralysis. *Advances in Neurology*, 67, 245–271.
- Herman, A., & Herman, A. P. (2013). Caffeine’s mechanism of action and its cosmetic use. *Skin Pharmacology and Physiology*, 26, 8–14.
- Hobson, J. A. (2009). REM sleep and dreaming: Towards a theory of protoconsciousness. *Nature Reviews Neuroscience*, 10, 803–814.
- Horikawa, T., Tamaki, M., Miyawaki, Y. & Kamitani, Y. (2013). Neural Decoding of Visual Imagery During Sleep. *Science*, 340(6132), 639–642. doi:10.1126/science.1234330
- Hossain, J. L., & Shapiro, C. M. (2002). The prevalence, cost implications, and management of sleep disorders: An overview. *Sleep and Breathing*, 6, 85–102.
- Huang, L. B., Tsai, M. C., Chen, C. Y., & Hsu, S. C. (2013). The effectiveness of light/dark exposure to treat insomnia in female nurses undertaking shift work during the evening/night shift. *Journal of Clinical Sleep Medicine*, 9, 641–646.
- Huber, R., Ghilardi, M. F., Massimini, M., & Tononi, G. (2004). Local sleep and learning. *Nature*, 430, 78–81.
- Jayanthi, L. D., & Ramamoorthy, S. (2005). Regulation of monoamine transporters: Influence of psychostimulants and therapeutic antidepressants. *The AAPS Journal*, 7, E728–738.
- Julien, R. M. (2005). Opioid analgesics. In *A primer of drug action: A comprehensive guide to the actions, uses, and side effects of psychoactive drugs* (pp. 461–500). Portland, OR: Worth.
- Kihlstrom, J. F. (2013). Neuro-hypnotism: Prospects for hypnosis and neuroscience. *Cortex*, 49, 365–374.
- Klein, D. C., Moore, R. Y., & Reppert, S. M. (Eds.). (1991). *Suprachiasmatic nucleus: The mind’s clock*. New York, NY: Oxford University Press.

- Kogan, N. M., & Mechoulam, R. (2007). Cannabinoids in health and disease. *Dialogues in Clinical Neuroscience*, 9, 413–430.
- Kromann, C. B., & Nielson, C. T. (2012). A case of cola dependency in a woman with recurrent depression. *BMC Research Notes*, 5, 692.
- Lang, A. J., Strauss, J. L., Bomeya, J., Bormann, J. E., Hickman, S. D., Good, R. C., & Essex, M. (2012). The theoretical and empirical basis for meditation as an intervention for PTSD. *Behavior Modification*, 36, 759–786.
- LaBerge, S. (1990). Lucid dreaming: Psychophysiological studies of consciousness during REM sleep. In R. R. Bootzen, J. F. Kihlstrom, & D. L. Schacter (Eds.), *Sleep and cognition* (pp. 109–126). Washington, DC: American Psychological Association.
- Lesku, J. A., Roth, T. C., 2nd, Amlaner, C. J., & Lima, S. L. (2006). A phylogenetic analysis of sleep architecture in mammals: The integration of anatomy, physiology, and ecology. *The American Naturalist*, 168, 441–453.
- Levitt, C., Shaw, E., Wong, S., & Kaczorowski, J. (2007). Systematic review of the literature on postpartum care: Effectiveness of interventions for smoking relapse prevention, cessation, and reduction in postpartum women. *Birth*, 34, 341–347.
- Lifshitz, M., Aubert Bonn, N., Fischer, A., Kashem, I. F., & Raz, A. (2013). Using suggestion to modulate automatic processes: From Stroop to McGurk and beyond. *Cortex*, 49, 463–473.
- Luppi, P. H., Clément, O., Sapin, E., Gervasoni, D., Peyron, C., Léger, L., . . . Fort, P. (2011). The neuronal network responsible for paradoxical sleep and its dysfunctions causing narcolepsy and rapid eye movement (REM) behavior disorder. *Sleep Medicine Reviews*, 15, 153–163.
- Mage, D. T., & Donner, M. (2006). Female resistance to hypoxia: Does it explain the sex difference in mortality rates? *Journal of Women's Health*, 15, 786–794.
- Mahowald, M. W., & Schenck, C. H. (2000). Diagnosis and management of parasomnias. *Clinical Cornerstone*, 2, 48–54.
- Mahowald, M. W., Schenck, C. H., & Cramer Bornemann, M. A. (2005). Sleep-related violence. *Current Neurology and Neuroscience Reports*, 5, 153–158.
- Mayo Clinic. (n.d.). *Sleep terrors (night terrors)*. Retrieved from <http://www.mayoclinic.org/diseases-conditions/night-terrors/basics/treatment/con-20032552>
- Mather, L. E., Rauwendaal, E. R., Moxham-Hall, V. L., & Wodak, A. D. (2013). (Re)introducing medical cannabis. *The Medical Journal of Australia*, 199, 759–761.
- Maxwell, J. C. (2006). *Trends in the abuse of prescription drugs*. Gulf Coast Addiction Technology Transfer Center. Retrieved from http://asi.nattc.org/userfiles/file/GulfCoast/PrescriptionTrends_Web.pdf
- McCarty, D. E. (2010). A case of narcolepsy with strictly unilateral cataplexy. *Journal of Clinical Sleep Medicine*, 15, 75–76.
- McDaid, C., Durée, K. H., Griffin, S. C., Weatherly, H. L., Stradling, J. R., Davies, R. J., . . . Westwood, M.

- E. (2009). A systematic review of continuous positive airway pressure for obstructive sleep apnoea-hypopnoea syndrome. *Sleep Medicine Reviews*, 13, 427–436.
- McKim, W. A., & Hancock, S. D. (2013). *Drugs and behavior: An introduction to behavioral pharmacology*, 7th edition. Boston, MA: Pearson.
- Mignot, E. J. M. (2012). A practical guide to the therapy of narcolepsy and hypersomnia syndromes. *Neurotherapeutics*, 9, 739–752.
- Miller, N. L., Shattuck, L. G., & Matsangas, P. (2010). Longitudinal study of sleep patterns of United States Military Academy cadets. *Sleep*, 33, 1623–1631.
- Mitchell, E. A. (2009). SIDS: Past, present and future. *Acta Paediatrica*, 98, 1712–1719.
- Montgomery, G. H., Schnur, J. B., & Kravits, K. (2012). Hypnosis for cancer care: Over 200 years young. *CA: A Cancer Journal for Clinicians*, 63, 31–44.
- National Institutes of Health. (n.d.). *Information about sleep*. Retrieved from <http://science.education.nih.gov/supplements/nih3/sleep/guide/info-sleep.htm>
- National Research Council. (1994). *Learning, remembering, believing: Enhancing human performance*. Washington, DC: The National Academies Press.
- National Sleep Foundation. (n.d.). *How much sleep do we really need?* Retrieved from <http://sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need>
- Ohayon, M. M. (1997). Prevalence of DSM-IV diagnostic criteria of insomnia: Distinguishing insomnia related to mental disorders from sleep disorders. *Journal of Psychiatric Research*, 31, 333–346.
- Ohayon, M. M. (2002). Epidemiology of insomnia: What we know and what we still need to learn. *Sleep Medicine Reviews*, 6, 97–111.
- Ohayon, M. M., Carskadon, M. A., Guilleminault, C., & Vitiello, M. V. (2004). Meta-analysis of quantitative sleep parameters from childhood to old age in healthy individuals: Developing normative sleep values across the human lifespan. *Sleep*, 27, 1255–1273.
- Ohayon, M. M., & Roth, T. (2002). Prevalence of restless legs syndrome and periodic limb movement disorder in the general population. *Journal of Psychosomatic Research*, 53, 547–554.
- Poe, G. R., Walsh, C. M., & Bjorness, T. E. (2010). Cognitive neuroscience of sleep. *Progress in Brain Research*, 185, 1–19.
- Porkka-Heiskanen, T. (2011). Methylxanthines and sleep. *Handbook of Experimental Pharmacology*, 200, 331–348.
- Presser, H. B. (1995). Job, family, and gender: Determinants of nonstandard work schedules among employed Americans in 1991. *Demography*, 32, 577–598.
- Pressman, M. R. (2007). Disorders of arousal from sleep and violent behavior: The role of physical contact and proximity. *Sleep*, 30, 1039–1047.
- Provini, F., Tinuper, P., Bisulli, F., & Lagaresi, E. (2011). Arousal disorders [Supplemental material]. *Sleep Medicine*, 12(2 Suppl.), S22–S26.

- Rattenborg, N. C., Lesku, J. A., Martinez-Gonzalez, D., & Lima, S. L. (2007). The non-trivial functions of sleep. *Sleep Medicine Reviews*, 11, 405–409.
- Raz, A. (2011). Hypnosis: A twilight zone of the top-down variety: Few have never heard of hypnosis but most know little about the potential of this mind-body regulation technique for advancing science. *Trends in Cognitive Sciences*, 15, 555–557.
- Raz, A., Shapiro, T., Fan, J., & Posner, M. I. (2002). Hypnotic suggestion and the modulation of Stroop interference. *Archives of General Psychiatry*, 59, 1151–1161.
- Reiner, K., Tibi, L., & Lipsitz, J. D. (2013). Do mindfulness-based interventions reduce pain intensity? A critical review of the literature. *Pain Medicine*, 14, 230–242.
- Restless Legs Syndrome Foundation. (n.d.). *Restless legs syndrome: Causes, diagnosis, and treatment for the patient living with Restless legs syndrome (RSL)*. Retrieved from www.rls.org
- Rial, R. V., Nicolau, M. C., Gamundí, A., Akaâr, M., Aparicio, S., Garau, C., . . . Esteban, S. (2007). The trivial function of sleep. *Sleep Medicine Reviews*, 11, 311–325.
- Riemann, D., Berger, M., & Volderholzer, U. (2001). Sleep and depression—Results from psychobiological studies: An overview. *Biological Psychology*, 57, 67–103.
- Reinerman, C. (2007, October 14). 5 myths about that demon crack. *Washington Post*. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/09/AR2007100900751.html>
- Reissig, C. J., Strain, E. C., & Griffiths, R. R. (2009). Caffeinated energy drinks—A growing problem. *Drug and Alcohol Dependence*, 99, 1–10.
- Robson, P. J. (2014). Therapeutic potential of cannabinoid medicines. *Drug Testing and Analysis*, 6, 24–30.
- Roth, T. (2007). Insomnia: Definition, prevalence, etiology, and consequences [Supplemental material]. *Journal of Clinical Sleep Medicine*, 3(5 Suppl.), S7–S10.
- Rothman, R. B., Blough, B. E., & Baumann, M. H. (2007). Dual dopamine/serotonin releasers as potential medications for stimulant and alcohol addictions. *The AAPS Journal*, 9, E1–10.
- Sánchez-de-la-Torre, M., Campos-Rodriguez, F., & Barbé, F. (2012). Obstructive sleep apnoea and cardiovascular disease. *The Lancet Respiratory Medicine*, 1, 31–72.
- Savard, J., Simard, S., Ivers, H., & Morin, C. M. (2005). Randomized study on the efficacy of cognitive-behavioral therapy for insomnia secondary to breast cancer, part I: Sleep and psychological effects. *Journal of Clinical Oncology*, 23, 6083–6096.
- Schicho, R., & Storr, M. (2014). Cannabis finds its way into treatment of Crohn's disease. *Pharmacology*, 93, 1–3.
- Shukla, R. K., Crump, J. L., & Chrisko, E. S. (2012). An evolving problem: Methamphetamine production and trafficking in the United States. *International Journal of Drug Policy*, 23, 426–435.
- Siegel, J. M. (2008). Do all animals sleep? *Trends in Neuroscience*, 31, 208–213.
- Siegel, J. M. (2001). The REM sleep-memory consolidation hypothesis. *Science*, 294, 1058–1063.
- Singh, G. K., & Siahpush, M. (2006). Widening socioeconomic inequalities in US life expectancy, 1980–2000. *International Journal of Epidemiology*, 35, 969–979.

- Smedslund, G., Fisher, K. J., Boles, S. M., & Lichtenstein, E. (2004). The effectiveness of workplace smoking cessation programmes: A meta-analysis of recent studies. *Tobacco Control*, 13, 197–204.
- Sofkitis, N., Giotitsas, N., Tsounapi, P., Baltogiannis, D., Giannakis, D., & Pardalidis, N. (2008). Hormonal regulation of spermatogenesis and spermiogenesis. *Journal of Steroid Biochemistry and Molecular Biology*, 109, 323–330.
- Steriade, M., & Amzica, F. (1998). Slow sleep oscillation, rhythmic K-complexes, and their paroxysmal developments [Supplemental material]. *Journal of Sleep Research*, 7(1 Suppl.), 30–35.
- Stickgold, R. (2005). Sleep-dependent memory consolidation. *Nature*, 437, 1272–1278.
- Stone, K. C., Taylor, D. J., McCrae, C. S., Kalsekar, A., & Lichstein, K. L. (2008). Nonrestorative sleep. *Sleep Medicine Reviews*, 12, 275–288.
- Suchecki, D., Tiba, P. A., & Machado, R. B. (2012). REM sleep rebound as an adaptive response to stressful situations. *Frontiers in Neuroscience*, 3. doi: 10.3389/fneur.2012.00041
- Task Force on Sudden Infant Death Syndrome. (2011). SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128, 1030–1039.
- Taillard, J., Philip, P., Coste, O., Sagaspe, P., & Bioulac, B. (2003). The circadian and homeostatic modulation of sleep pressure during wakefulness differs between morning and evening chronotypes. *Journal of Sleep Research*, 12, 275–282.
- Thach, B. T. (2005). The role of respiratory control disorders in SIDS. *Respiratory Physiology & Neurobiology*, 149, 343–353.
- U.S. Food and Drug Administration. (2013, October 24). *Statement on Proposed Hydrocodone Reclassification from Janet Woodcock, M.D., Director, Center for Drug Evaluation and Research*. Retrieved from <http://www.fda.gov/drugs/drugsafety/ucm372089.htm>
- Vogel, G. W. (1975). A review of REM sleep deprivation. *Archives of General Psychiatry*, 32, 749–761.
- Vøllestad, J., Nielsen, M. B., & Nielsen, G. H. (2012). Mindfulness- and acceptance-based interventions for anxiety disorders: A systematic review and meta-analysis. *The British Journal of Clinical Psychology*, 51, 239–260.
- Wagner, U., Gais, S., & Born, J. (2001). Emotional memory formation is enhanced across sleep intervals with high amounts of rapid eye movement sleep. *Learning & Memory*, 8, 112–119.
- Wagner, U., Gais, S., Haider, H., Verleger, R., & Born, J. (2004). Sleep improves insight. *Nature*, 427, 352–355.
- Walker, M. P. (2009). The role of sleep in cognition and emotion. *Annals of the New York Academy of Sciences*, 1156, 168–197.
- Wark, D. M. (2011). Traditional and alert hypnosis for education: A literature review. *The American Journal of Clinical Hypnosis*, 54(2), 96–106.
- Waterhouse, J., Fukuda, Y., & Morita, T. (2012). Daily rhythms of the sleep-wake cycle [Special issue]. *Journal of Physiological Anthropology*, 31(5). doi:10.1186/1880-6805-31-5

- Welsh, D. K., Takahashi, J. S., & Kay, S. A. (2010). Suprachiasmatic nucleus: Cell autonomy and network properties. *Annual Review of Physiology*, 72, 551–577.
- West, S., Boughton, M., & Byrnes, M. (2009). Juggling multiple temporalities: The shift work story of mid-life nurses. *Journal of Nursing Management*, 17, 110–119.
- White, D. P. (2005). Pathogenesis of obstructive and central sleep apnea. *American Journal of Respiratory and Critical Care Medicine*, 172, 1363–1370.
- Williams, J., Roth, A., Vathauer, K., & McCrae, C. S. (2013). Cognitive behavioral treatment of insomnia. *Chest*, 143, 554–565.
- Williamson, A. M., & Feyer, A. M. (2000). Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication. *Occupational and Environmental Medicine*, 57, 649–655.
- Wolt, B. J., Ganetsky, M., & Babu, K. M. (2012). Toxicity of energy drinks. *Current Opinion in Pediatrics*, 24, 243–251.
- Zangini, S., Calandra-Buonaura, G., Grimaldi, D., & Cortelli, P. (2011). REM behaviour disorder and neurodegenerative diseases [Supplemental material]. *Sleep Medicine*, 12(2 Suppl.), S54–S58.
- Zeidan, F., Grant, J. A., Brown, C. A., McHaffie, J. G., & Coghill, R. C. (2012). Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain. *Neuroscience Letters*, 520, 165–173.

PART V

SENSATION AND PERCEPTION



If you were standing in the midst of this street scene, you would be absorbing and processing numerous pieces of sensory input. (credit: modification of work by Cory Zanker)

Imagine standing on a city street corner. You might be struck by movement everywhere as cars and people go about their business, by the sound of a street musician's melody or a horn honking in the distance, by the smell of exhaust fumes or of food being sold by a nearby vendor, and by the sensation of hard pavement under your feet.

We rely on our sensory systems to provide important information about our surroundings. We use this information to successfully navigate and interact with our environment so that we can find nourishment, seek shelter, maintain social relationships, and avoid potentially dangerous situations.

This chapter will provide an overview of how sensory information is received and processed by the nervous system and how that affects our conscious experience of the world. We begin by learning the distinction between sensation and perception. Then we consider the physical properties of light and sound stimuli, along with an overview of the basic structure and function of the major sensory systems. The chapter will close with a discussion of a historically important theory of perception called Gestalt.

22.

SENSATION VERSUS PERCEPTION

Learning Objectives

By the end of this section, you will be able to:

- Distinguish between sensation and perception
- Describe the concepts of absolute threshold and difference threshold
- Discuss the roles attention, motivation, and sensory adaptation play in perception

Sensation

What does it mean to sense something? **Sensory receptors** are *specialized neurons that respond to specific types of stimuli*. When sensory information is detected by a sensory receptor, sensation occurs. For example, light that enters the eye causes chemical changes in cells that line the back of the eye. These cells relay messages, in the form of action potentials (as you learned when studying biopsychology), to the central nervous system. The conversion from sensory stimulus energy to action potential is known as transduction.

You have probably known since elementary school that we have five senses: vision, hearing (audition), smell (olfaction), taste (gustation), and touch (somatosensation). It turns out that this notion of five senses is oversimplified. We also have sensory systems that provide information about balance (the vestibular sense), body position and movement (proprioception and kinesthesia), pain (nociception), and temperature (thermoception).

The sensitivity of a given sensory system to the relevant stimuli can be expressed as an absolute threshold. Absolute threshold refers to the minimum amount of stimulus energy that must be present for the stimulus to be detected 50% of the time. Another way to think about this is by asking how dim can a light be or how soft can a sound be and still be detected half of the time. The sensitivity of our sensory receptors can be quite amazing. It has been estimated that on a clear night, the most sensitive sensory cells in the back of the eye can

detect a candle flame 30 miles away (Okawa & Sampath, 2007). Under quiet conditions, the hair cells (the receptor cells of the inner ear) can detect the tick of a clock 20 feet away (Galanter, 1962).

It is also possible for us to get messages that are presented below the threshold for conscious awareness—these are called subliminal messages. A stimulus reaches a physiological threshold when it is strong enough to excite sensory receptors and send nerve impulses to the brain; this is an absolute threshold. A message below that threshold is said to be subliminal; we receive it, but we are not consciously aware of it. Over the years there has been a great deal of speculation about the use of subliminal messages in advertising, rock music, and self-help audio programs. Research evidence shows that in laboratory settings, people can process and respond to information outside of awareness. But this does not mean that we obey these messages like zombies; in fact, hidden messages have little effect on behavior outside the laboratory (Kunst-Wilson & Zajonc, 1980; Rensink, 2004; Nelson, 2008; Radel, Sarrazin, Legrain, & Gobancé, 2009; Loersch, Durso, & Petty, 2013).

Absolute thresholds are generally measured under incredibly controlled conditions in situations that are optimal for sensitivity. Sometimes, we are more interested in how much difference in stimuli is required to detect a difference between them. This is known as the just noticeable difference (jnd) or difference threshold. Unlike the absolute threshold, the difference threshold changes depending on the stimulus intensity. As an example, imagine yourself in a very dark movie theater. If an audience member were to receive a text message on her cell phone which caused her screen to light up, chances are that many people would notice the change in illumination in the theater. However, if the same thing happened in a brightly lit arena during a basketball game, very few people would notice. The cell phone brightness does not change, but its ability to be detected as a change in illumination varies dramatically between the two contexts. Ernst Weber proposed this theory of change in difference threshold in the 1830s, and it has become known as Weber's law: the difference threshold is a constant fraction of the original stimulus, as the example illustrates.

Try out the Just Noticeable Difference

The exercise below is to help demonstrate the concept of the *just noticeable difference*. On the left is a yellow circle on a black background. Below this image is a slider with two dots on either end. Notice how the yellow circle in the center becomes brighter when you click on the far right dot.

Now, consider the right-hand image where the yellow circle is against a white background. If you click between the two dots on either side of that slider, do you notice the yellow circle becoming brighter?



An interactive H5P element has been excluded from this version of the text. You can view it online

here:

<https://louis.pressbooks.pub/intropsychology/?p=362#h5p-100>



An interactive H5P element has been excluded from this version of the text. You can view it online

here:

<https://louis.pressbooks.pub/intropsychology/?p=362#h5p-101>

In both cases, the yellow dot increases in brightness with the same intensity. It is, however, much easier to notice when it is against a black background compared to when it is against a white background. This demonstrates how detecting small changes in a stimulus depends on the context around it.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=362#h5p-102>

Perception

While our sensory receptors are constantly collecting information from the environment, it is ultimately

how we interpret that information that affects how we interact with the world. Perception refers to the way sensory information is organized, interpreted, and consciously experienced. Perception involves both bottom-up and top-down processing. Bottom-up processing refers to the fact that perceptions are built from sensory input. On the other hand, how we interpret those sensations is influenced by our available knowledge, our experiences, and our thoughts. This is called top-down processing.

One way to think of this concept is that sensation is a physical process, whereas perception is psychological. For example, upon walking into a kitchen and smelling the scent of baking cinnamon rolls, the *sensation* is the scent receptors detecting the odor of cinnamon, but the *perception* may be “Mmm, this smells like the bread Grandma used to bake when the family gathered for holidays.”

Although our perceptions are built from sensations, not all sensations result in perception. In fact, we often don’t perceive stimuli that remain relatively constant over prolonged periods of time. This is known as sensory adaptation. Imagine entering a classroom with an old analog clock. Upon first entering the room, you can hear the ticking of the clock; as you begin to engage in conversation with classmates or listen to your professor greet the class, you are no longer aware of the ticking. The clock is still ticking, and that information is still affecting sensory receptors of the auditory system. The fact that you no longer perceive the sound demonstrates sensory adaptation and shows that while closely associated, sensation and perception are different.

There is another factor that affects sensation and perception: attention. Attention plays a significant role in determining what is sensed versus what is perceived. Imagine you are at a party full of music, chatter, and laughter. You get involved in an interesting conversation with a friend, and you tune out all the background noise. If someone interrupted you to ask what song had just finished playing, you would probably be unable to answer that question.

See for yourself how inattention blindness works by checking out this selective attention test from Simons and Chabris (1999): [selective attention test](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=362#oembed-1>

One of the most interesting demonstrations of how important attention is in determining our perception of the environment occurred in a famous study conducted by Daniel Simons and Christopher Chabris (1999). In this study, participants watched a video of people dressed in black and white passing basketballs. Participants were asked to count the number of times the team in white passed the ball. During the video, a person dressed

in a black gorilla costume walks among the two teams. You would think that someone would notice the gorilla, right? Nearly half of the people who watched the video didn't notice the gorilla at all, despite the fact that he was clearly visible for nine seconds. Because participants were so focused on the number of times the white team was passing the ball, they completely tuned out other visual information. Failure to notice something that is completely visible because of a lack of attention is called inattention blindness.

In a similar experiment, researchers tested inattention blindness by asking participants to observe images moving across a computer screen. They were instructed to focus on either white or black objects, disregarding the other color. When a red cross passed across the screen, about one-third of subjects did not notice it (Most, Simons, Scholl, & Chabris, 2000).

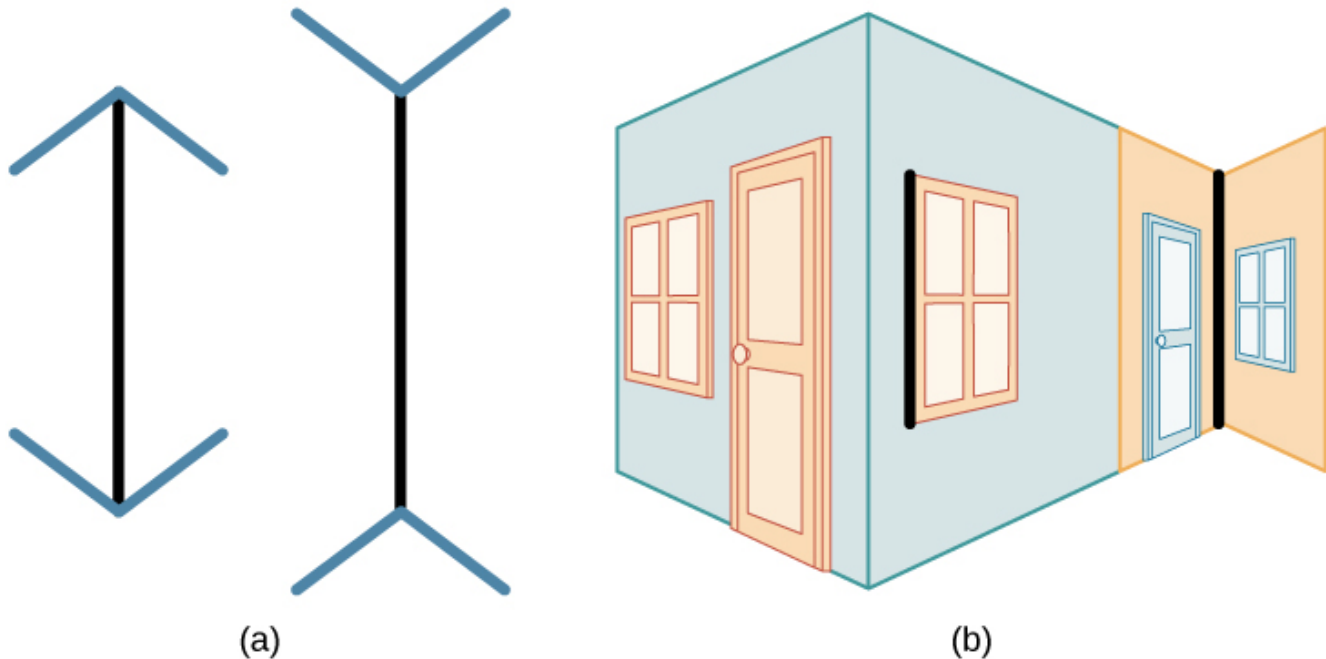


Nearly one-third of participants in a study did not notice that a red cross passed on the screen because their attention was focused on the black or white figures. (credit: Cory Zanker)

Motivation can also affect perception. Have you ever been expecting a really important phone call and, while taking a shower, you think you hear the phone ringing, only to discover that it is not? If so, then you have experienced how motivation to detect a meaningful stimulus can shift our ability to discriminate between a true sensory stimulus and background noise. The ability to identify a stimulus when it is embedded in a distracting background is called signal detection theory. This might also explain why a mother is awakened by a quiet murmur from her baby but not by other sounds that occur while she is asleep. Signal detection theory has practical applications, such as increasing air traffic controller accuracy. Controllers need to be able to detect planes among many signals (blips) that appear on the radar screen and follow those planes as they move through the sky. In fact, the original work of the researcher who developed signal detection theory was focused on improving the sensitivity of air traffic controllers to plane blips (Swets, 1964).

Our perceptions can also be affected by our beliefs, values, prejudices, expectations, and life experiences. As

you will see later in this chapter, individuals who are deprived of the experience of binocular vision during critical periods of development have trouble perceiving depth (Fawcett, Wang, & Birch, 2005). The shared experiences of people within a given cultural context can have pronounced effects on perception. For example, Marshall Segall, Donald Campbell, and Melville Herskovits (1963) published the results of a multinational study in which they demonstrated that individuals from Western cultures were more prone to experience certain types of visual illusions than individuals from non-Western cultures, and vice versa. One such illusion that Westerners were more likely to experience was the Müller-Lyer illusion: the lines appear to be different lengths, but they are actually the same length.



In the Müller-Lyer illusion, lines appear to be different lengths although they are identical. (a) Arrows at the ends of lines may make the line on the right appear longer, although the lines are the same length. (b) When applied to a three-dimensional image, the line on the right again may appear longer although both black lines are the same length.

These perceptual differences were consistent with differences in the types of environmental features experienced on a regular basis by people in a given cultural context. People in Western cultures, for example, have a perceptual context of buildings with straight lines, what Segall's study called a carpentered world (Segall et al., 1966). In contrast, people from certain non-Western cultures with an uncarpentered view, such as the Zulu of South Africa, whose villages are made up of round huts arranged in circles, are less susceptible to this illusion (Segall et al., 1999). It is not just vision that is affected by cultural factors. Indeed, research has demonstrated that the ability to identify an odor, and rate its pleasantness and its intensity, varies cross-culturally (Ayabe-Kanamura, Saito, Distel, Martínez-Gómez, & Hudson, 1998).

Children described as thrill seekers are more likely to show taste preferences for intense sour flavors (Liem, Westerbeek, Wolterink, Kok, & de Graaf, 2004), which suggests that basic aspects of personality might affect

perception. Furthermore, individuals who hold positive attitudes toward reduced-fat foods are more likely to rate foods labeled as reduced fat as tasting better than people who have less positive attitudes about these products (Aaron, Mela, & Evans, 1994).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=362#h5p-103>

Summary

Sensation occurs when sensory receptors detect sensory stimuli. Perception involves the organization, interpretation, and conscious experience of those sensations. All sensory systems have both absolute and difference thresholds, which refer to the minimum amount of stimulus energy or the minimum amount of difference in stimulus energy required to be detected about 50% of the time, respectively. Sensory adaptation, selective attention, and signal detection theory can help explain what is perceived and what is not. In addition, our perceptions are affected by a number of factors, including beliefs, values, prejudices, culture, and life experiences.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=362#h5p-104>

Critical Thinking Question

Not everything that is sensed is perceived. Do you think there could ever be a case where something could be perceived without being sensed?

This would be a good time for students to think about claims of extrasensory perception.

Another interesting topic would be the phantom limb phenomenon experienced by amputees.

Please generate a novel (new) example of how just noticeable difference can change as a function of stimulus intensity.

There are many potential examples. One example involves the detection of weight differences.

If two people are holding standard envelopes and one contains a quarter while the other is empty, the difference in weight between the two is easy to detect. However, if those envelopes are placed inside two textbooks of equal weight, the ability to discriminate which is heavier is much more difficult.

Personal Application Question

Think about a time when you failed to notice something around you because your attention was focused elsewhere. If someone pointed it out, were you surprised that you hadn't noticed it right away?

23.

VISION

Learning Objectives

By the end of this section, you will be able to:

- Describe the basic anatomy of the visual system
- Discuss how rods and cones contribute to different aspects of vision
- Describe how monocular and binocular cues are used in the perception of depth

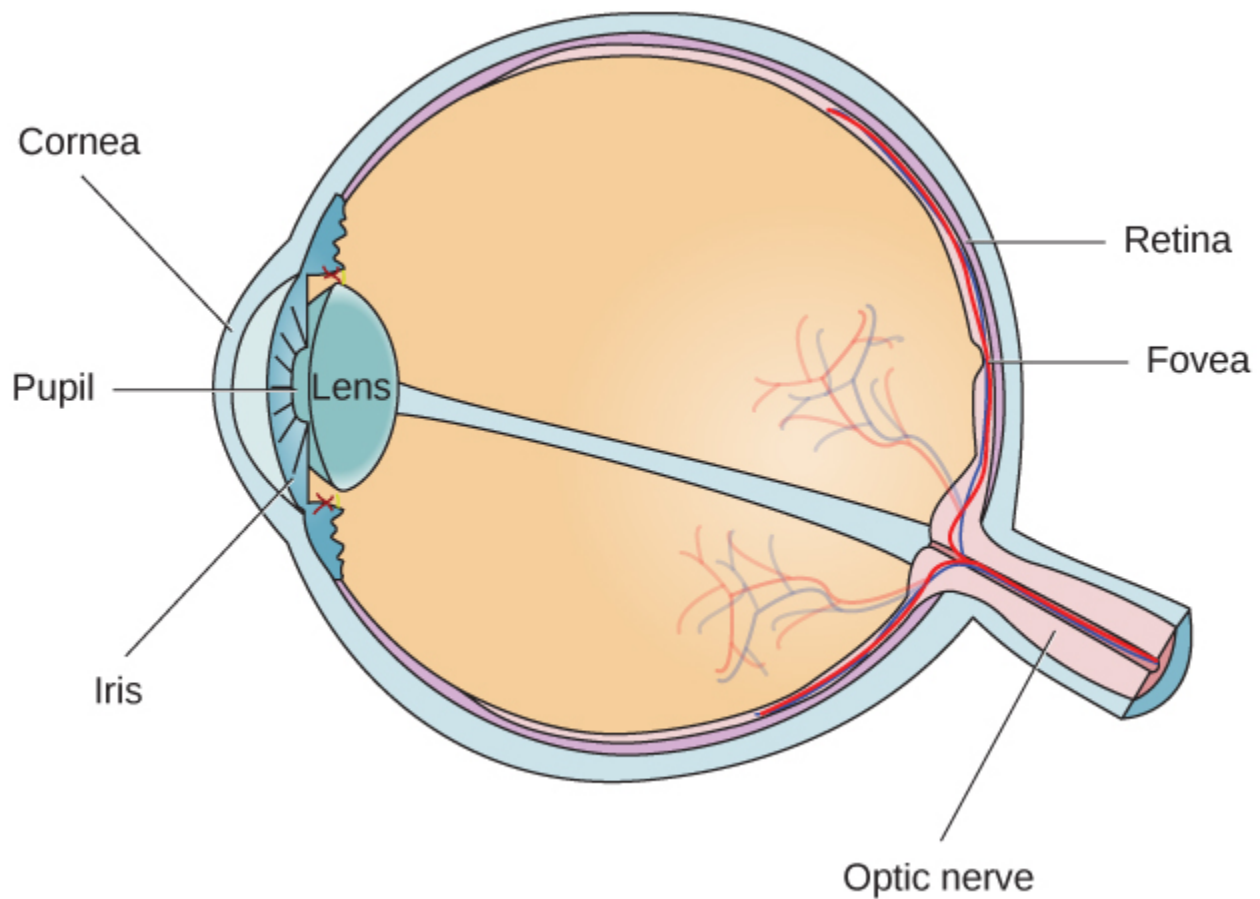
The visual system constructs a mental representation of the world around us. This contributes to our ability to successfully navigate through physical space and interact with important individuals and objects in our environments. This section will provide an overview of the basic anatomy and function of the visual system. In addition, we will explore our ability to perceive color and depth.



Our eyes take in sensory information that helps us understand the world around us. (credit “top left”: modification of work by “rajkumar1220”/Flickr; credit “top right”: modification of work by Thomas Leuthard; credit “middle left”: modification of work by Demietrich Baker; credit “middle right”: modification of work by “kaybee07”/Flickr; credit “bottom left”: modification of work by “Isengardt”/Flickr; credit “bottom right”: modification of work by Willem Heerbaart)

Anatomy of the Visual System

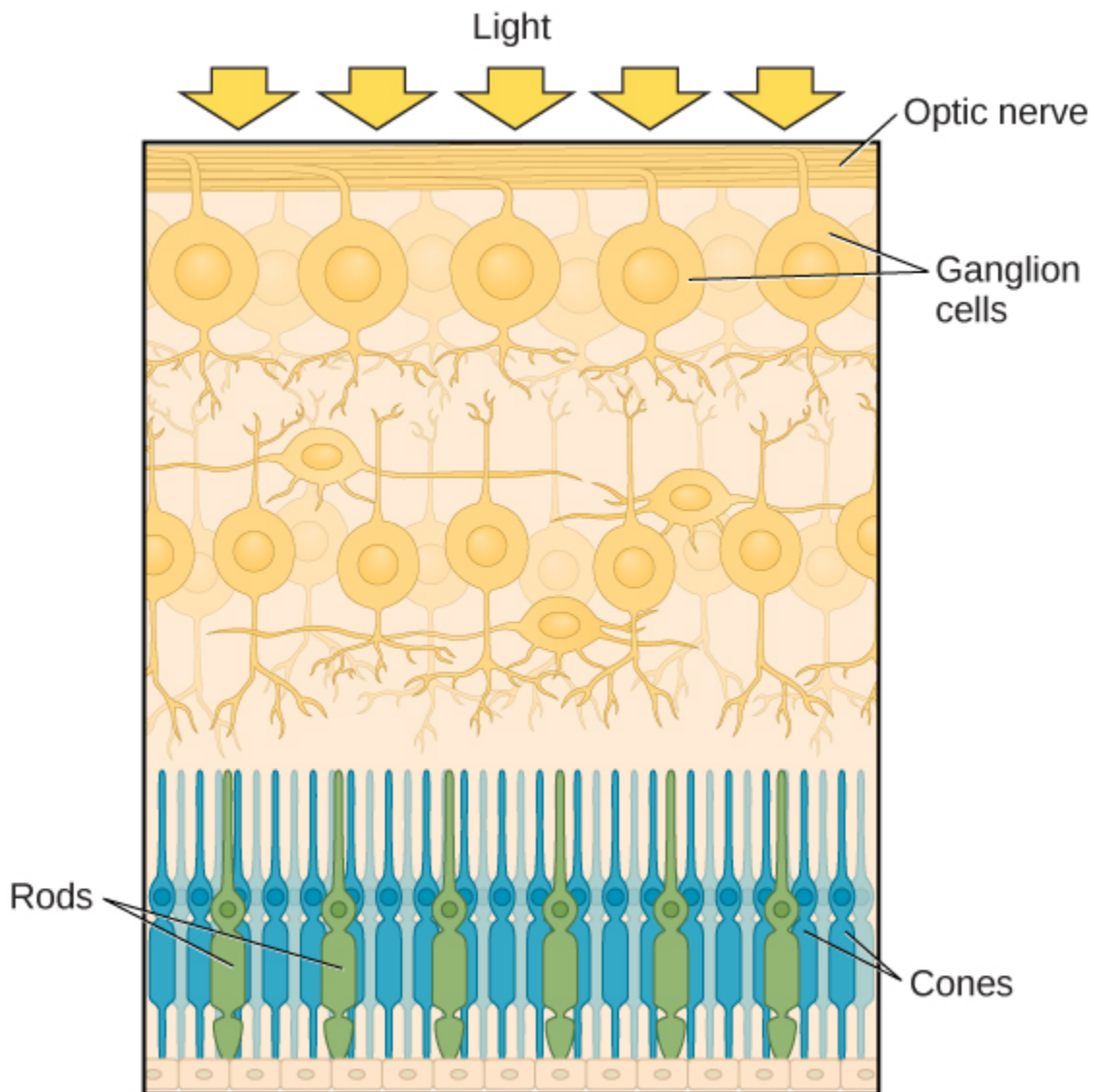
The eye is the major sensory organ involved in vision. Light waves are transmitted across the cornea and enter the eye through the pupil. The cornea is the transparent covering over the eye. It serves as a barrier between the inner eye and the outside world, and it is involved in focusing light waves that enter the eye. The pupil is the small opening in the eye through which light passes, and the size of the pupil can change as a function of light levels as well as emotional arousal. When light levels are low, the pupil will become dilated, or expanded, to allow more light to enter the eye. When light levels are high, the pupil will constrict, or become smaller, to reduce the amount of light that enters the eye. The pupil’s size is controlled by muscles that are connected to the iris, which is the colored portion of the eye.



The anatomy of the eye is illustrated in this diagram.

After passing through the pupil, light crosses the lens, a curved, transparent structure that serves to provide additional focus. The lens is attached to muscles that can change its shape to aid in focusing light that is reflected from near or far objects. In a normal-sighted individual, the lens will focus images perfectly on a small indentation in the back of the eye known as the fovea, which is part of the retina, the light-sensitive lining of the eye. The fovea contains densely packed specialized photoreceptor cells. These photoreceptor cells, known as cones, are light-detecting cells. The cones are specialized types of photoreceptors that work best in bright light conditions. Cones are very sensitive to acute detail and provide tremendous spatial resolution. They also are directly involved in our ability to perceive color.

While cones are concentrated in the fovea, where images tend to be focused, rods, another type of photoreceptor, are located throughout the remainder of the retina. Rods are specialized photoreceptors that work well in low light conditions, and while they lack the spatial resolution and color function of the cones, they are involved in our vision in dimly lit environments as well as in our perception of movement on the periphery of our visual field.



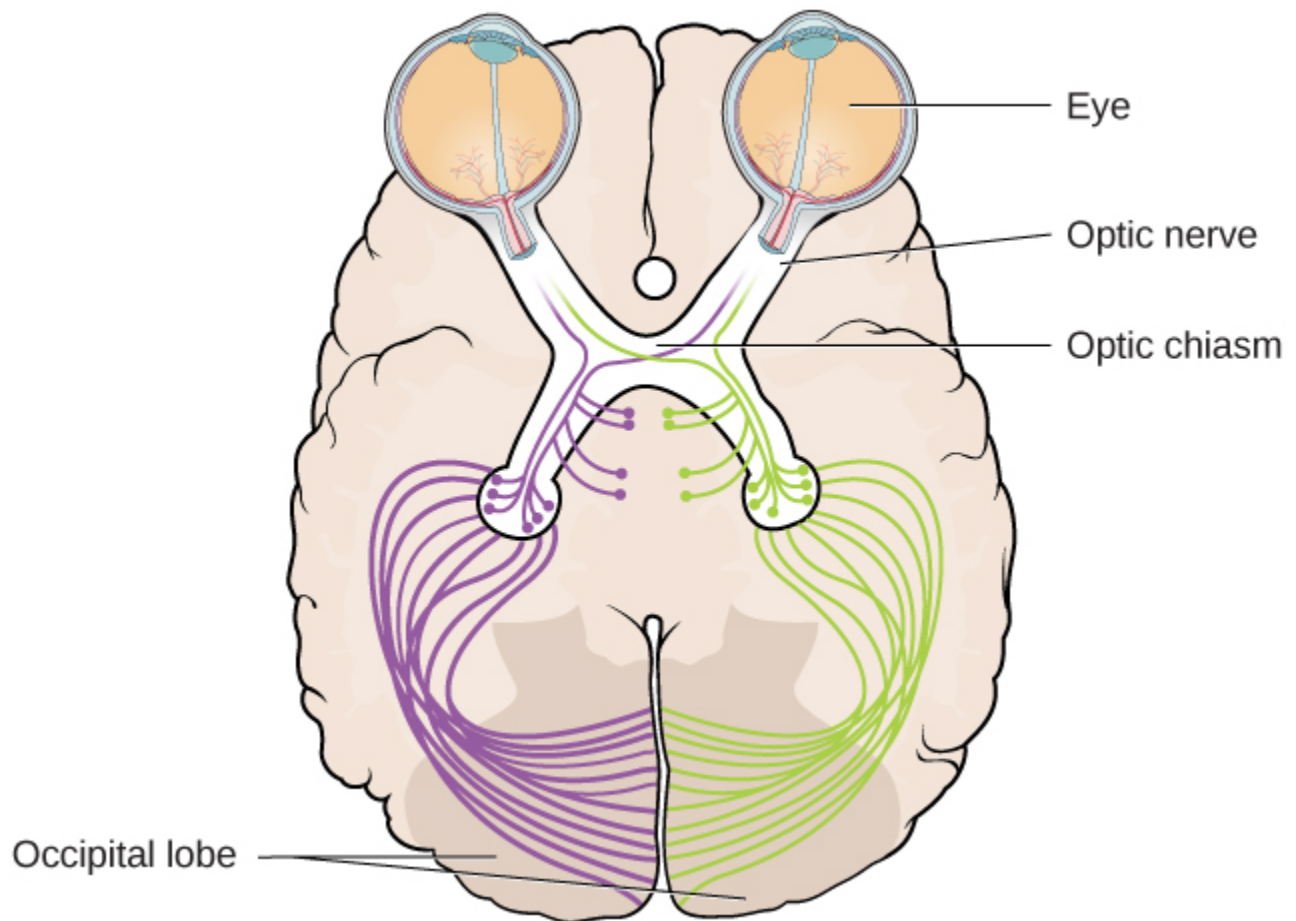
The two types of photoreceptors are shown in this image. Rods are colored green and cones are blue.

We have all experienced the different sensitivities of rods and cones when making the transition from a brightly lit environment to a dimly lit environment. Imagine going to see a blockbuster movie on a clear summer day. As you walk from the brightly lit lobby into the dark theater, you notice that you immediately have difficulty seeing much of anything. After a few minutes, you begin to adjust to the darkness and can see the interior of the theater. In the bright environment, your vision was dominated primarily by cone activity. As you move to the dark environment, rod activity dominates, but there is a delay in transitioning between the phases. If your rods do not transform light into nerve impulses as easily and efficiently as they should, you will have difficulty seeing in dim light, a condition known as night blindness.

Rods and cones are connected (via several interneurons) to retinal ganglion cells. Axons from the retinal ganglion cells converge and exit through the back of the eye to form the optic nerve. The optic nerve carries visual information from the retina to the brain. There is a point in the visual field called the blind spot; even

when light from a small object is focused on the blind spot, we do not see it. We are not consciously aware of our blind spots for two reasons: First, each eye gets a slightly different view of the visual field, therefore, the blind spots do not overlap. Second, our visual system fills in the blind spot so that although we cannot respond to visual information that occurs in that portion of the visual field, we are also not aware that information is missing.

The optic nerve from each eye merges just below the brain at a point called the optic chiasm. As shown, the optic chiasm is an X-shaped structure that sits just below the cerebral cortex at the front of the brain. At the point of the optic chiasm, information from the right visual field (which comes from both eyes) is sent to the left side of the brain, and information from the left visual field is sent to the right side of the brain.



This illustration shows the optic chiasm at the front of the brain and the pathways to the occipital lobe at the back of the brain, where visual sensations are processed into meaningful perceptions.

Once inside the brain, visual information is sent via a number of structures to the occipital lobe at the back of the brain for processing. Visual information might be processed in parallel pathways which can generally be described as the “what pathway” and the “where/how pathway.” The “what pathway” is involved in object recognition and identification, while the “where/how pathway” is involved with location in space and how one might interact with a particular visual stimulus (Milner & Goodale, 2008; Ungerleider & Haxby, 1994). For

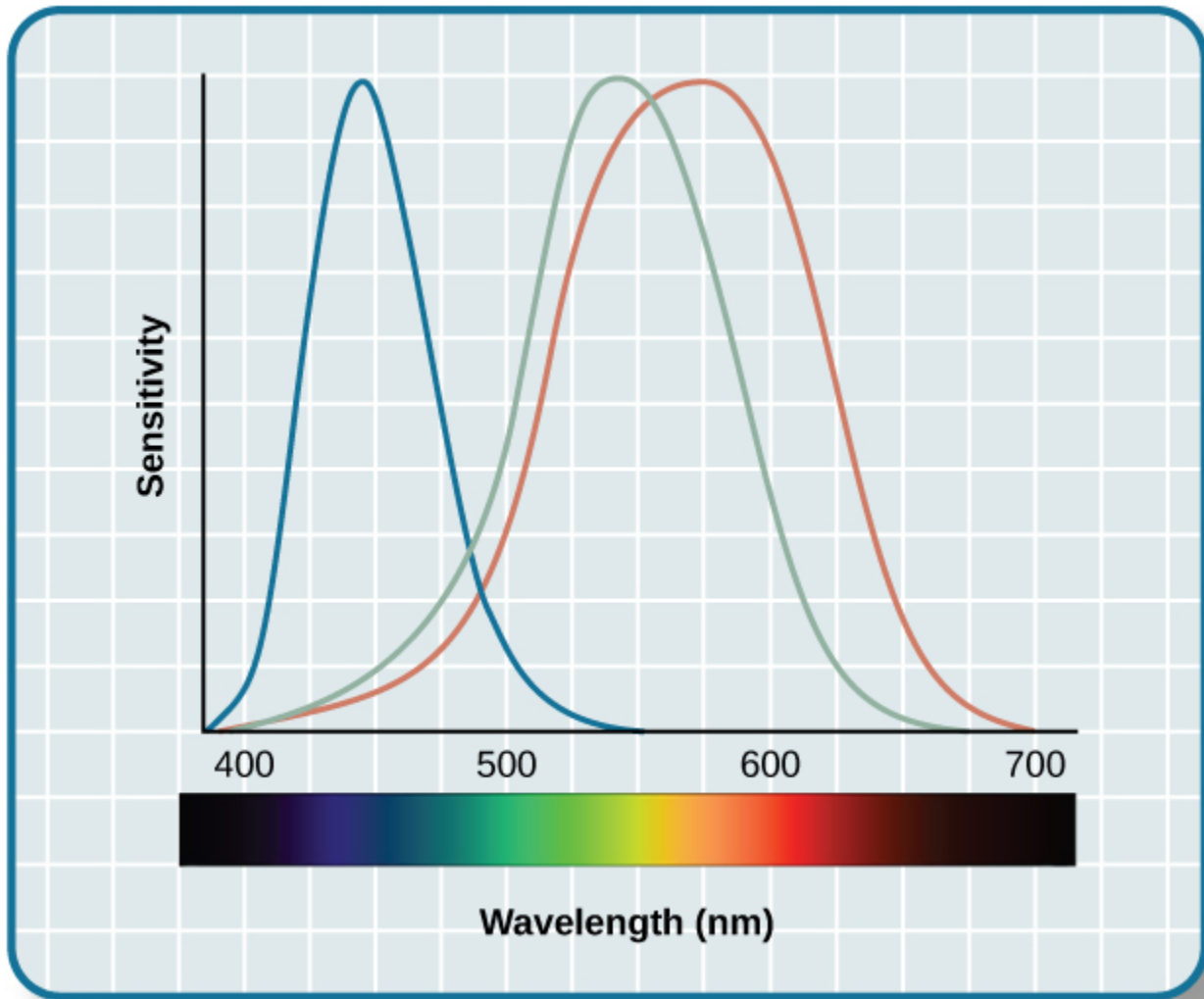
example, when you see a ball rolling down the street, the “what pathway” identifies what the object is, and the “where/how pathway” identifies its location or movement in space.

Color and Depth Perception

We do not see the world in black and white; neither do we see it as two-dimensional (2-D) or flat (just height and width, no depth). Let’s look at how color vision works and how we perceive three dimensions (height, width, and depth).

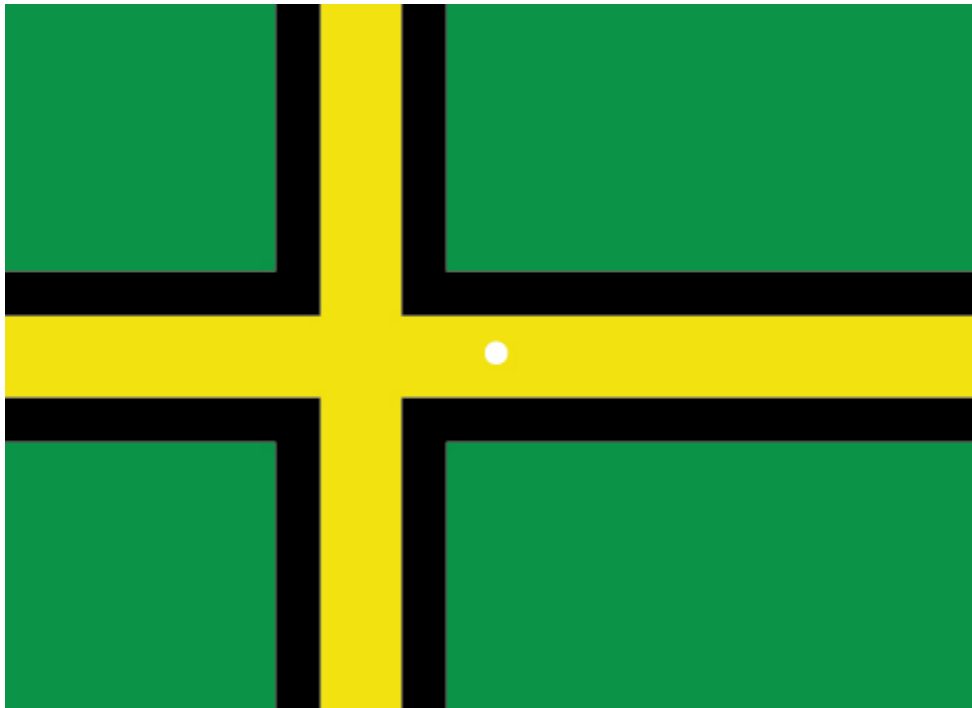
Color Vision

Normal-sighted individuals have three different types of cones that mediate color vision. Each of these cone types is maximally sensitive to a slightly different wavelength of light. According to the trichromatic theory of color vision all colors in the spectrum can be produced by combining red, green, and blue. The three types of cones are each receptive to one of the colors.



This figure illustrates the different sensitivities for the three cone types found in a normal-sighted individual. (credit: modification of work by Vanessa Ezekowitz)

The trichromatic theory of color vision is not the only theory—another major theory of color vision is known as the opponent-process theory. According to this theory, color is coded in opponent pairs: black-white, yellow-blue, and green-red. The basic idea is that some cells of the visual system are excited by one of the opponent colors and inhibited by the other. So, a cell that was excited by wavelengths associated with green would be inhibited by wavelengths associated with red, and vice versa. One of the implications of opponent processing is that we do not experience greenish-reds or yellowish-blues as colors. Another implication is that this leads to the experience of negative afterimages. An afterimage describes the continuation of a visual sensation after removal of the stimulus. For example, when you stare briefly at the sun and then look away from it, you may still perceive a spot of light although the stimulus (the sun) has been removed. When color is involved in the stimulus, the color pairings identified in the opponent-process theory lead to a negative afterimage. You can test this concept using the flag in the image below.



Stare at the white dot for 30–60 seconds and then move your eyes to a blank piece of white paper. What do you see? This is known as a negative afterimage, and it provides empirical support for the opponent-process theory of color vision.

But these two theories—the trichromatic theory of color vision and the opponent-process theory—are not mutually exclusive. Research has shown that they just apply to different levels of the nervous system. For visual processing on the retina, trichromatic theory applies: the cones are responsive to three different wavelengths that represent red, blue, and green. But once the signal moves past the retina on its way to the brain, the cells respond in a way consistent with opponent-process theory (Land, 1959; Kaiser, 1997).

Watch this video to see the first part of a documentary explaining color vision in more detail:
[The Science of Color Perception](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=366#oembed-1>

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=366#h5p-110>

Depth Perception

Our ability to perceive spatial relationships in three-dimensional (3-D) space is known as depth perception. With depth perception, we can describe things as being in front, behind, above, below, or to the side of other things.

Our world is three-dimensional, so it makes sense that our mental representation of the world has three-dimensional properties. We use a variety of cues in a visual scene to establish our sense of depth. Some of these are binocular cues, which means that they rely on the use of both eyes. One example of a binocular depth cue is binocular disparity, the slightly different view of the world that each of our eyes receives. To experience this slightly different view, do this simple exercise: extend your arm fully, then extend one of your fingers and focus on that finger. Now, close your left eye without moving your head, then open your left eye and close your right eye without moving your head. You will notice that your finger seems to shift as you alternate between the two eyes because of the slightly different view each eye has of your finger.

A 3-D movie works on the same principle: the special glasses you wear allow the two slightly different images projected onto the screen to be seen separately by your left and your right eye. As your brain processes these images, you have the illusion that the leaping animal or running person is coming right toward you.

Although we rely on binocular cues to experience depth in our 3-D world, we can also perceive depth in 2-D arrays. Think about all the paintings and photographs you have seen. Generally, you pick up on depth in these images even though the visual stimulus is 2-D. When we do this, we are relying on a number of monocular cues, or cues that require only one eye. If you think you can't see depth with one eye, note that you don't bump into things when using only one eye while walking—and, in fact, we have more monocular cues than binocular cues.

An example of a monocular cue would be what is known as linear perspective. Linear perspective refers to the fact that we perceive depth when we see two parallel lines that seem to converge in an image. Some other

monocular depth cues are interposition, the partial overlap of objects, and the relative size and closeness of images to the horizon.



We perceive depth in a two-dimensional figure like this one through the use of monocular cues like linear perspective, like the parallel lines converging as the road narrows in the distance. (credit: Marc Dalmulder)

STEREOBLINDNESS

Bruce Bridgeman was born with an extreme case of lazy eye that resulted in him being stereoblind, or unable to respond to binocular cues of depth. He relied heavily on monocular depth cues, but he never had a true appreciation of the 3-D nature of the world around him. This all changed one night in 2012 while Bruce was seeing a movie with his wife.

The movie the couple was going to see was shot in 3-D, and even though he thought it was a waste of money, Bruce paid for the 3-D glasses when he purchased his ticket. As soon as the film began, Bruce put on the glasses and experienced something completely new. For the first time in his life, he appreciated the true depth of the world around him. Remarkably, his ability to perceive depth persisted outside of the movie theater.

There are cells in the nervous system that respond to binocular depth cues. Normally, these cells require activation during early development in order to persist, so experts familiar with Bruce's case (and others like his) assume that at some point in his development, Bruce must have experienced at least a fleeting moment of binocular vision. It was enough to ensure the survival of the cells in the visual system tuned to binocular cues. The mystery now is why it took Bruce nearly 70 years to have these cells activated (Peck, 2012).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=366#h5p-111>

Summary

Light waves cross the cornea and enter the eye at the pupil. The eye's lens focuses this light so that the image is focused on a region of the retina known as the fovea. The fovea contains cones that possess high levels of visual acuity and operate best in bright light conditions. Rods are located throughout the retina and operate best under dim light conditions. Visual information leaves the eye via the optic nerve. Information from each visual field is sent to the opposite side of the brain at the optic chiasm. Visual information then moves through a number of brain sites before reaching the occipital lobe, where it is processed.

Two theories explain color perception. The trichromatic theory asserts that three distinct cone groups are tuned to slightly different wavelengths of light, and it is the combination of activity across these cone types that results in our perception of all the colors we see. The opponent-process theory of color vision asserts that color is processed in opponent pairs and accounts for the interesting phenomenon of a negative afterimage. We perceive depth through a combination of monocular and binocular depth cues.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=366#h5p-112>

Critical Thinking Question

Compare the two theories of color perception. Are they completely different?

The trichromatic theory of color vision and the opponent-process theory are not mutually exclusive. Research has shown they apply to different levels of the nervous system. For visual processing on the retina, trichromatic theory applies: the cones are responsive to three different wavelengths that represent red, blue, and green. But once the signal moves past the retina on its way to the brain, the cells respond in a way consistent with opponent-process theory.

Color is not a physical property of our environment. What function (if any) do you think color vision serves?

Color vision probably serves multiple adaptive purposes. One popular hypothesis suggests that seeing in color allowed our ancestors to differentiate ripened fruits and vegetables more easily.

Personal Application Question

Take a look at a few of your photos or personal works of art. Can you find examples of linear perspective as a potential depth cue?

24.

HEARING

Learning Objectives

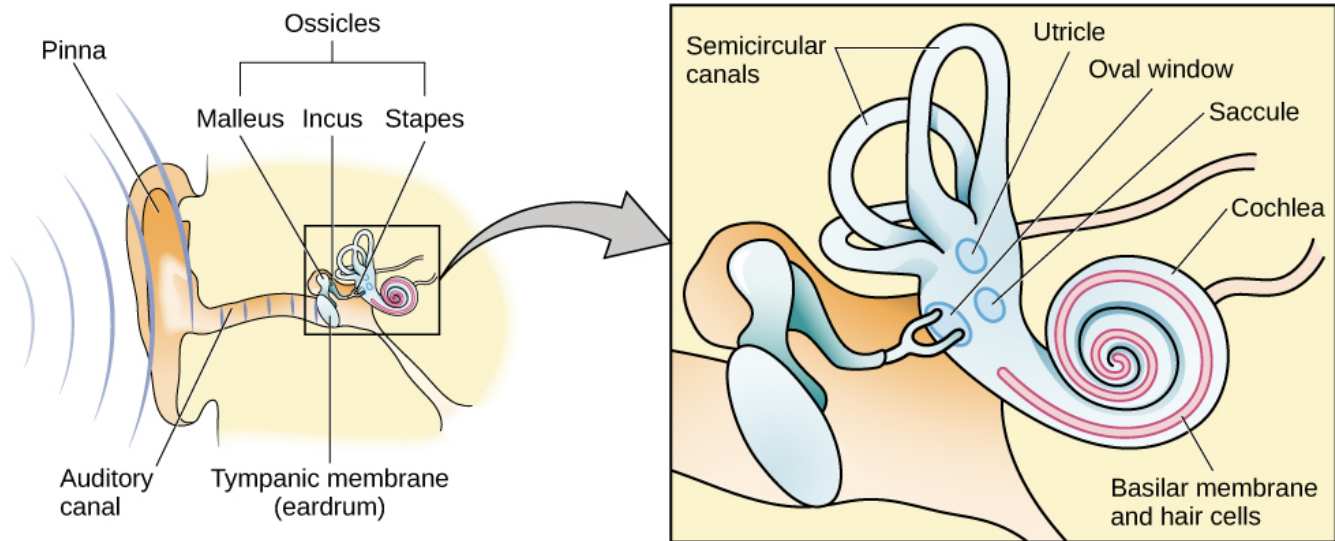
By the end of this section, you will be able to:

- Describe the basic anatomy and function of the auditory system
- Explain how we encode and perceive pitch
- Discuss how we localize sound

Our auditory system converts pressure waves into meaningful sounds. This translates into our ability to hear the sounds of nature, to appreciate the beauty of music, and to communicate with one another through spoken language. This section will provide an overview of the basic anatomy and function of the auditory system. It will include a discussion of how the sensory stimulus is translated into neural impulses, where in the brain that information is processed, how we perceive pitch, and how we know where sound is coming from.

Anatomy of the Auditory System

The ear can be separated into multiple sections. The outer ear includes the pinna, which is the visible part of the ear that protrudes from our heads, the auditory canal, and the tympanic membrane, or eardrum. The middle ear contains three tiny bones known as the ossicles, which are named the malleus (or hammer), incus (or anvil), and the stapes (or stirrup). The inner ear contains the semi-circular canals, which are involved in balance and movement (the vestibular sense), and the cochlea. The cochlea is a fluid-filled, snail-shaped structure that contains the sensory receptor cells (hair cells) of the auditory system.



The ear is divided into outer (pinna and tympanic membrane), middle (the three ossicles: malleus, incus, and stapes), and inner (cochlea and basilar membrane) divisions.

Sound waves travel along the auditory canal and strike the tympanic membrane, causing it to vibrate. This vibration results in movement of the three ossicles. As the ossicles move, the stapes presses into a thin membrane of the cochlea known as the oval window. As the stapes presses into the oval window, the fluid inside the cochlea begins to move, which in turn stimulates hair cells, which are auditory receptor cells of the inner ear embedded in the basilar membrane. The basilar membrane is a thin strip of tissue within the cochlea.

The activation of hair cells is a mechanical process: the stimulation of the hair cell ultimately leads to the activation of the cell. As hair cells become activated, they generate neural impulses that travel along the auditory nerve to the brain. Auditory information is shuttled to the inferior colliculus, the medial geniculate nucleus of the thalamus, and finally to the auditory cortex in the temporal lobe of the brain for processing. Like the visual system, there is also evidence suggesting that information about auditory recognition and localization is processed in parallel streams (Rauschecker & Tian, 2000; Renier et al., 2009).

Pitch Perception

Different frequencies of sound waves are associated with differences in our perception of the pitch of those sounds. Low-frequency sounds are lower pitched, and high-frequency sounds are higher pitched. How does the auditory system differentiate among various pitches?

Several theories have been proposed to account for pitch perception. We'll discuss two of them here: temporal theory and place theory. The temporal theory of pitch perception asserts that frequency is coded by the activity level of a sensory neuron. This would mean that a given hair cell would fire action potentials related to the frequency of the sound wave. While this is a very intuitive explanation, we detect such a broad range of

frequencies (20–20,000 Hz) that the frequency of action potentials fired by hair cells cannot account for the entire range. Because of properties related to sodium channels on the neuronal membrane that are involved in action potentials, there is a point at which a cell cannot fire any faster (Shamma, 2001).

The place theory of pitch perception suggests that different portions of the basilar membrane are sensitive to sounds of different frequencies. More specifically, the base of the basilar membrane responds best to high frequencies and the tip of the basilar membrane responds best to low frequencies. Therefore, hair cells that are in the base portion would be labeled as high-pitch receptors, while those in the tip of basilar membrane would be labeled as low-pitch receptors (Shamma, 2001).

In reality, both theories explain different aspects of pitch perception. At frequencies up to about 4000 Hz, it is clear that both the rate of action potentials and place contribute to our perception of pitch. However, much-higher-frequency sounds can only be encoded using place cues (Shamma, 2001).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=368#h5p-114>

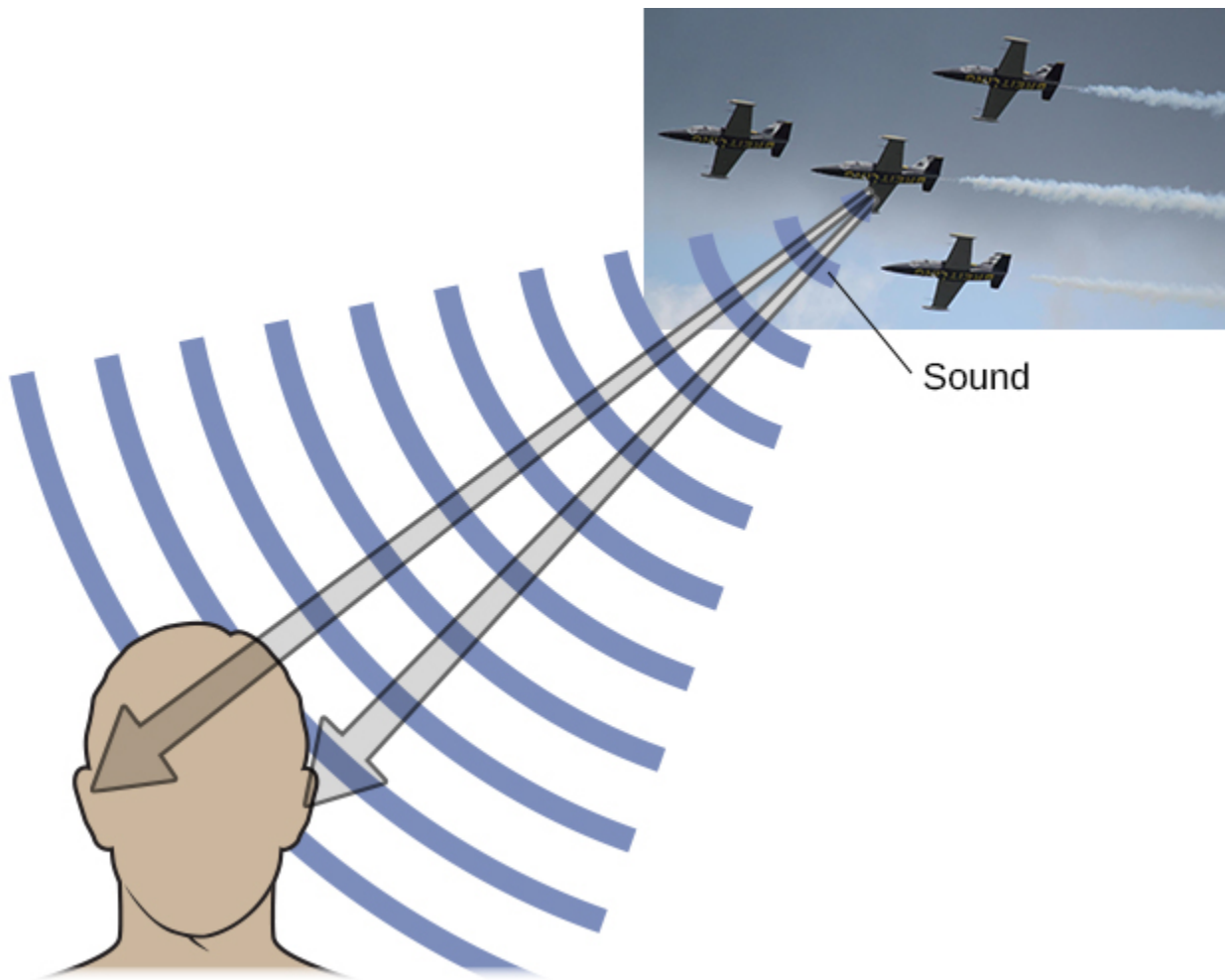
Sound Localization

The ability to locate sound in our environments is an important part of hearing. Localizing sound could be considered similar to the way that we perceive depth in our visual fields. Like the monocular and binocular cues that provide information about depth, the auditory system uses both monaural (one-eared) and binaural (two-eared) cues to localize sound.

Each pinna interacts with incoming sound waves differently, depending on the sound's source relative to our bodies. This interaction provides a monaural cue that is helpful in locating sounds that occur above or below and in front or behind us. The sound waves received by your two ears from sounds that come from directly

above, below, in front, or behind you would be identical; therefore, monaural cues are essential (Grothe, Pecka, & McAlpine, 2010).

Binaural cues, on the other hand, provide information on the location of a sound along a horizontal axis by relying on differences in patterns of vibration of the eardrum between our two ears. If a sound comes from an off-center location, it creates two types of binaural cues: interaural level differences and interaural timing differences. Interaural level difference refers to the fact that a sound coming from the right side of your body is more intense at your right ear than at your left ear because of the attenuation of the sound wave as it passes through your head. Interaural timing difference refers to the small difference in the time at which a given sound wave arrives at each ear. Certain brain areas monitor these differences to construct where along a horizontal axis a sound originates (Grothe et al., 2010).



Localizing sound involves the use of both monaural and binaural cues. (credit “plane”: modification of work by Max Pfandl)

Hearing Loss

Deafness is the partial or complete inability to hear. Some people are born deaf, which is known as congenital deafness. Many others begin to suffer from conductive hearing loss because of age, genetic predisposition, or environmental effects, including exposure to extreme noise (noise-induced hearing loss), as shown in the images below, certain illnesses (such as measles or mumps), or damage due to toxins (such as those found in certain solvents and metals).



(a)



(b)

Environmental factors that can lead to conductive hearing loss include regular exposure to loud music or construction equipment. (a) Rock musicians and (b) construction workers are at risk for this type of hearing loss. (credit a: modification of work by Kenny Sun; credit b: modification of work by Nick Allen)

Given the mechanical nature by which the sound wave stimulus is transmitted from the eardrum through the ossicles to the oval window of the cochlea, some degree of hearing loss is inevitable. With conductive hearing loss, hearing problems are associated with a failure in the vibration of the eardrum and/or movement of the ossicles. These problems are often dealt with through devices like hearing aids that amplify incoming sound waves to make vibration of the eardrum and movement of the ossicles more likely to occur.

When the hearing problem is associated with a failure to transmit neural signals from the cochlea to the brain, it is called sensorineural hearing loss. One disease that results in sensorineural hearing loss is Ménière's disease. Although not well understood, Ménière's disease results in a degeneration of inner ear structures that can lead to hearing loss, tinnitus (constant ringing or buzzing), vertigo (a sense of spinning), and an increase in pressure within the inner ear (Semaan & Megerian, 2011). This kind of loss cannot be treated with hearing aids, but some individuals might be candidates for a cochlear implant as a treatment option. Cochlear implants

are electronic devices that consist of a microphone, a speech processor, and an electrode array. The device receives incoming sound information and directly stimulates the auditory nerve to transmit information to the brain.

Watch this video describing cochlear implant surgeries and how they work: [Cochlear Implant Surgery](#).

Deaf Culture

In the United States and other places around the world, deaf people have their own language, schools, and customs. This is called deaf culture. In the United States, deaf individuals often communicate using American Sign Language (ASL); ASL has no verbal component and is based entirely on visual signs and gestures. The primary mode of communication is signing. One of the values of deaf culture is to continue traditions like using sign language rather than teaching deaf children to try to speak, read lips, or have cochlear implant surgery.

When a child is diagnosed as deaf, parents have difficult decisions to make. Should the child be enrolled in mainstream schools and taught to verbalize and read lips? Or should the child be sent to a school for deaf children to learn ASL and have significant exposure to deaf culture? Do you think there might be differences in the way that parents approach these decisions depending on whether or not they are also deaf?

Summary

Sound waves are funneled into the auditory canal and cause vibrations of the eardrum; these vibrations move the ossicles. As the ossicles move, the stapes presses against the oval window of the cochlea, which causes fluid inside the cochlea to move. As a result, hair cells embedded in the basilar membrane become enlarged, which sends neural impulses to the brain via the auditory nerve.

Pitch perception and sound localization are important aspects of hearing. Our ability to perceive pitch relies on both the firing rate of the hair cells in the basilar membrane as well as their location within the membrane. In terms of sound localization, both monaural and binaural cues are used to locate where sounds originate in our environment.

Individuals can be born deaf, or they can develop deafness as a result of age, genetic predisposition, and/or environmental causes. Hearing loss that results from a failure of the vibration of the eardrum or the

resultant movement of the ossicles is called conductive hearing loss. Hearing loss that involves a failure of the transmission of auditory nerve impulses to the brain is called sensorineural hearing loss.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=368#h5p-115>

Critical Thinking Question

Given what you've read about sound localization, from an evolutionary perspective, how does sound localization facilitate survival?

Sound localization would have allowed early humans to locate prey and protect themselves from predators.

How can temporal and place theories both be used to explain our ability to perceive the pitch of sound waves with frequencies up to 4000 Hz?

Pitch of sounds below this threshold could be encoded by the combination of the place and firing rate of stimulated hair cells. So, in general, hair cells located near the tip of the basilar membrane would signal that we're dealing with a lower-pitched sound. However, differences in firing rates of hair cells within this location could allow for fine discrimination between low-, medium-, and high-pitch sounds within the larger low-pitch context.

Personal Application Question

If you had to choose to lose either your vision or your hearing, which would you choose and why?

25.

TASTING, SMELLING, AND TOUCHING

Learning Objectives

By the end of this section, you will be able to:

- Describe the basic functions of the chemical senses
- Explain the basic functions of the somatosensory, nociceptive, and thermoceptive sensory systems
- Describe the basic functions of the vestibular, proprioceptive, and kinesthetic sensory systems

Vision and hearing have received an incredible amount of attention from researchers over the years. While there is still much to be learned about how these sensory systems work, we have a much better understanding of them than of our other sensory modalities. In this section, we will explore our chemical senses (taste and smell) and our body senses (touch, temperature, pain, balance, and body position).

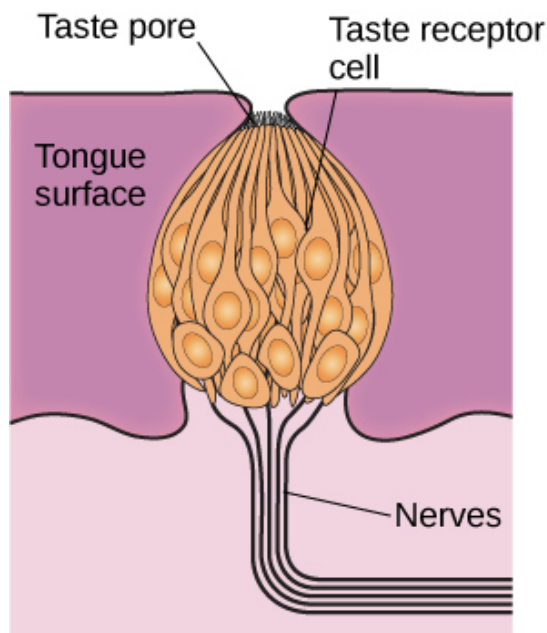
The Chemical Senses

Taste (gustation) and smell (olfaction) are called chemical senses because both have sensory receptors that respond to molecules in the food we eat or in the air we breathe. There is a pronounced interaction between our chemical senses. For example, when we describe the flavor of a given food, we are really referring to both gustatory and olfactory properties of the food working in combination.

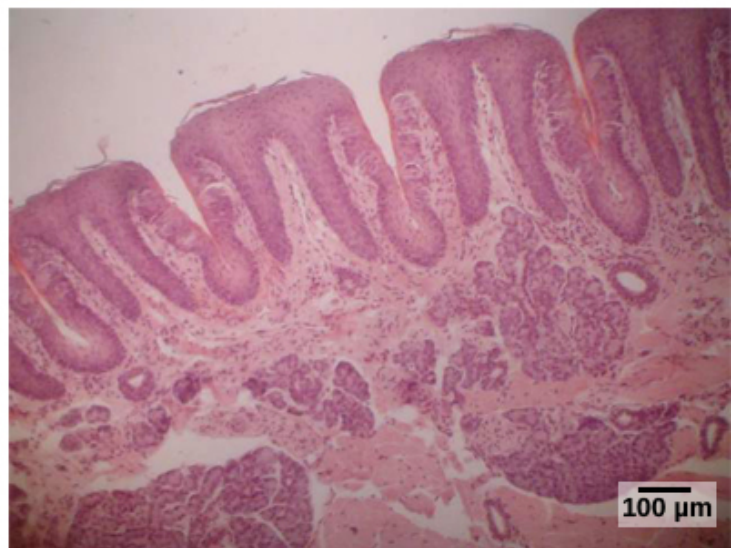
Taste (Gustation)

You have learned since elementary school that there are four basic groupings of taste: sweet, salty, sour, and bitter. Research demonstrates, however, that we have at least six taste groupings. Umami is our fifth taste. Umami is actually a Japanese word that roughly translates to yummy, and it is associated with a taste for monosodium glutamate (Kinnamon & Vandenbeuch, 2009). There is also a growing body of experimental evidence suggesting that we possess a taste for the fatty content of a given food (Mizushige, Inoue, & Fushiki, 2007).

Molecules from the food and beverages we consume dissolve in our saliva and interact with taste receptors on our tongue and in our mouth and throat. Taste buds are formed by groupings of taste receptor cells with hair-like extensions that protrude into the central pore of the taste bud. Taste buds have a life cycle of ten days to two weeks, so even destroying some by burning your tongue won't have any long-term effect; they just grow right back. Taste molecules bind to receptors on this extension and cause chemical changes within the sensory cell that result in neural impulses being transmitted to the brain via different nerves, depending on where the receptor is located. Taste information is transmitted to the medulla, thalamus, and limbic system, and to the gustatory cortex, which is tucked underneath the overlap between the frontal and temporal lobes (Maffei, Haley, & Fontanini, 2012; Roper, 2013).



(a)

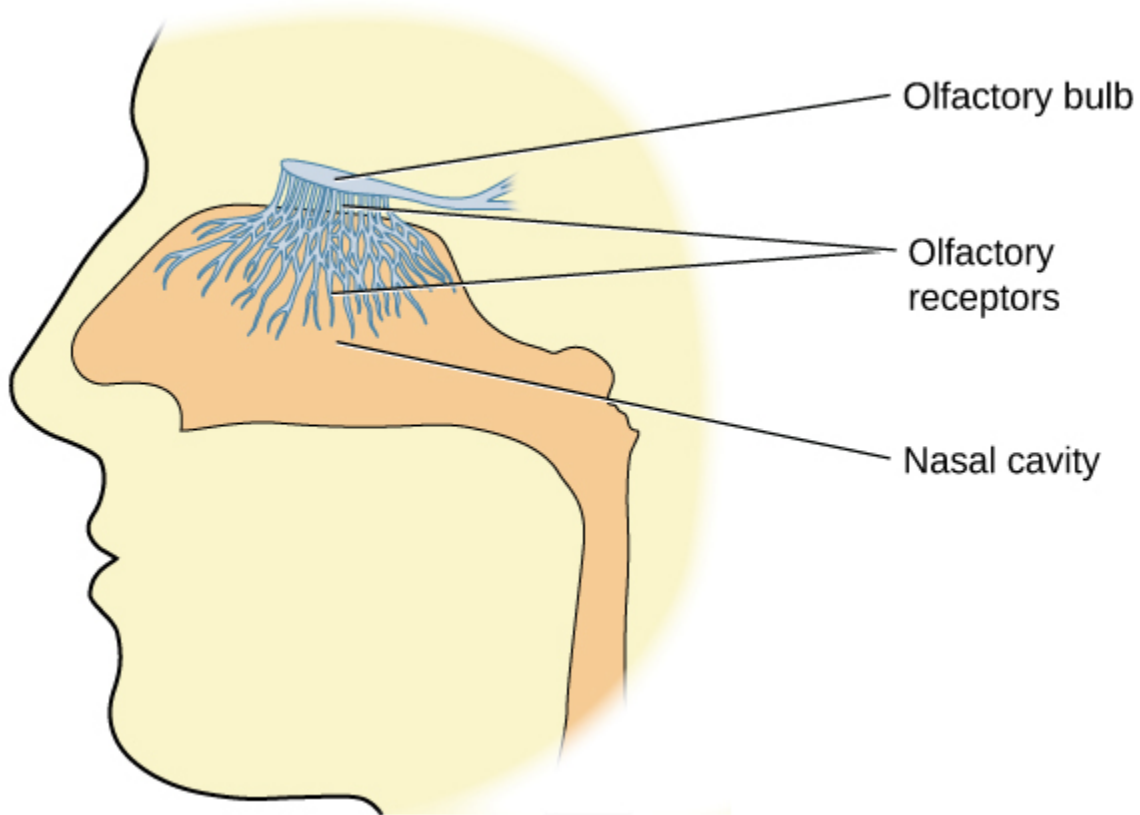


(b)

(a) Taste buds are composed of a number of individual taste receptor cells that transmit information to nerves. (b) This micrograph shows a close-up view of the tongue's surface. (credit a: modification of work by Jonas Töle; credit b: scale-bar data from Matt Russell)

Smell (Olfaction)

Olfactory receptor cells are located in a mucous membrane at the top of the nose. Small hair-like extensions from these receptors serve as the sites for odor molecules dissolved in the mucus to interact with chemical receptors located on these extensions. Once an odor molecule has bound a given receptor, chemical changes within the cell result in signals being sent to the olfactory bulb: a bulb-like structure at the tip of the frontal lobe where the olfactory nerves begin. From the olfactory bulb, information is sent to regions of the limbic system and to the primary olfactory cortex, which is located very near the gustatory cortex (Lodovichi & Belluscio, 2012; Spors et al., 2013).



Olfactory receptors are the hair-like parts that extend from the olfactory bulb into the mucous membrane of the nasal cavity.

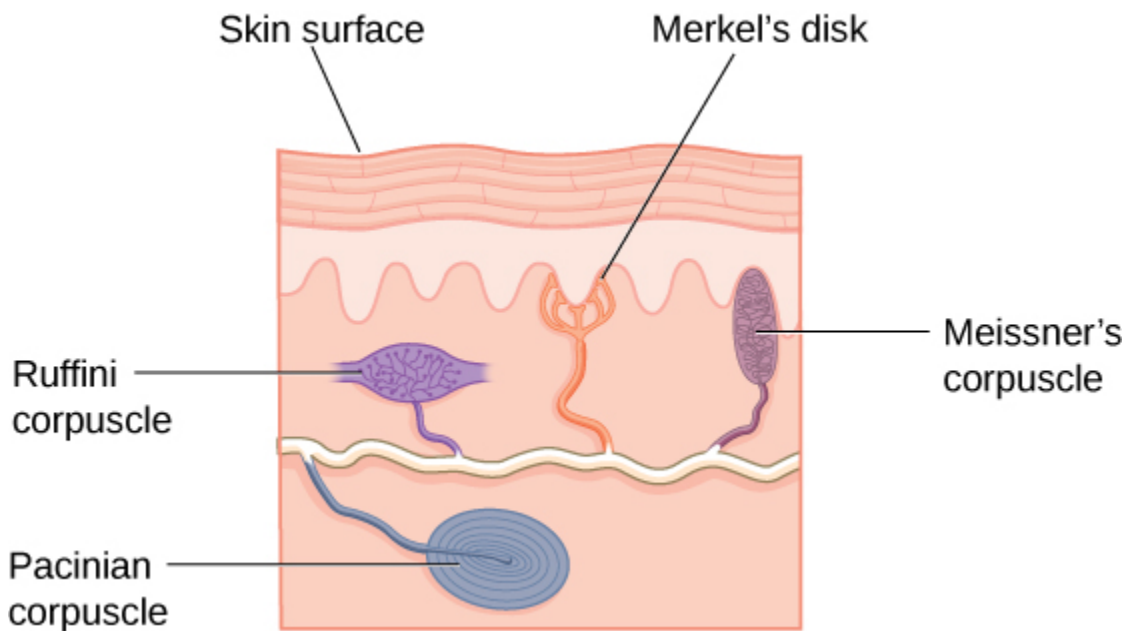
There is tremendous variation in the sensitivity of the olfactory systems of different species. We often think of dogs as having far superior olfactory systems than our own, and indeed, dogs can do some remarkable things with their noses. There is some evidence to suggest that dogs can “smell” dangerous drops in blood glucose levels as well as cancerous tumors (Wells, 2010). Dogs’ extraordinary olfactory abilities may be due to the increased number of functional genes for olfactory receptors (between 800 and 1200), compared to the fewer than 400 observed in humans and other primates (Niimura & Nei, 2007).

Many species respond to chemical messages, known as pheromones, sent by another individual (Wysocki &

Preti, 2004). Pheromonal communication often involves providing information about the reproductive status of a potential mate. So, for example, when a female rat is ready to mate, she secretes pheromonal signals that draw attention from nearby male rats. Pheromonal activation is actually an important component in eliciting sexual behavior in the male rat (Furlow, 1996, 2012; Purvis & Haynes, 1972; Sachs, 1997). There has also been a good deal of research (and controversy) about pheromones in humans (Comfort, 1971; Russell, 1976; Wolfgang-Kimball, 1992; Weller, 1998).

Touch

A number of receptors are distributed throughout the skin to respond to various touch-related stimuli. These receptors include Meissner's corpuscles, Pacinian corpuscles, Merkel's disks, and Ruffini corpuscles. Meissner's corpuscles respond to pressure and lower frequency vibrations, and Pacinian corpuscles detect transient pressure and higher frequency vibrations. Merkel's disks respond to light pressure, while Ruffini corpuscles detect stretch (Abraira & Ginty, 2013).



There are many types of sensory receptors located in the skin, each attuned to specific touch-related stimuli.

In addition to the receptors located in the skin, there are also a number of free nerve endings that serve sensory functions. These nerve endings respond to a variety of different types of touch-related stimuli and serve as sensory receptors for both thermoception (temperature perception) and nociception (a signal indicating potential harm and maybe pain) (Garland, 2012; Petho & Reeh, 2012; Spray, 1986). Sensory information collected from the receptors and free nerve endings travels up the spinal cord and is transmitted to regions of

the medulla, thalamus, and ultimately to the somatosensory cortex, which is located in the postcentral gyrus of the parietal lobe.

Pain Perception

Pain is an unpleasant experience that involves both physical and psychological components. Feeling pain is quite adaptive because it makes us aware of an injury, and it motivates us to remove ourselves from the cause of that injury. In addition, pain also makes us less likely to suffer additional injury because we will be gentler with our injured body parts.

Generally speaking, pain can be considered to be neuropathic or inflammatory in nature. Pain that signals some type of tissue damage is known as inflammatory pain. In some situations, pain results from damage to neurons of either the peripheral or central nervous system. As a result, pain signals that are sent to the brain get exaggerated. This type of pain is known as neuropathic pain. Multiple treatment options for pain relief range from relaxation therapy to the use of analgesic medications to deep brain stimulation. The most effective treatment option for a given individual will depend on a number of considerations, including the severity and persistence of the pain and any medical/psychological conditions.

Some individuals are born without the ability to feel pain. This very rare genetic disorder is known as congenital insensitivity to pain (or congenital analgesia). While those with congenital analgesia can detect differences in temperature and pressure, they cannot experience pain. As a result, they often suffer significant injuries. Young children have serious mouth and tongue injuries because they have bitten themselves repeatedly. Not surprisingly, individuals suffering from this disorder have much shorter life expectancies due to their injuries and secondary infections of injured sites (U.S. National Library of Medicine, 2013).

Watch this video to learn more about congenital insensitivity to pain: [People who feel no pain but suffer enormously | 60 Minutes Australia](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=370#oembed-1>

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=370#h5p-117>

Summary

Taste (gustation) and smell (olfaction) are chemical senses that employ receptors on the tongue and in the nose that bind directly with taste and odor molecules in order to transmit information to the brain for processing. Our ability to perceive touch, temperature, and pain is mediated by a number of receptors and free nerve endings that are distributed throughout the skin and various tissues of the body. The vestibular sense helps us maintain a sense of balance through the response of hair cells in the utricle, saccule, and semi-circular canals that respond to changes in head position and gravity. Our proprioceptive and kinesthetic systems provide information about body position and body movement through receptors that detect stretch and tension in the muscles, joints, tendons, and skin of the body.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=370#h5p-118>

Critical Thinking Questions

Many people experience nausea while traveling in a car, plane, or boat. How might you explain this as a function of sensory interaction?

When traveling by car, we often have visual information that suggests that we are in motion while our vestibular sense indicates that we're not moving (assuming we're traveling at a relatively constant speed). Normally, these two sensory modalities provide congruent information, but the discrepancy might lead to confusion and nausea. The converse would be true when traveling by plane or boat.

If you heard someone say that they would do anything not to feel the pain associated with significant injury, how would you respond given what you've just read?

Pain serves important functions that are critical to our survival. As noxious as pain stimuli may be, the experiences of individuals who suffer from congenital insensitivity to pain makes the consequences of a lack of pain all too apparent.

Do you think women experience pain differently than men? Why do you think this is?

Research has shown that women and men do differ in their experience of and tolerance for pain: Women tend to handle pain better than men. Perhaps this is due to women's labor and childbirth experience. Men tend to be stoic about their pain and do not seek help. Research also shows that gender differences in pain tolerance can vary across cultures. .

Personal Application Question

As mentioned earlier, a food's flavor represents an interaction of both gustatory and olfactory information. Think about the last time you were seriously congested due to a cold or the flu. What changes did you notice in the flavors of the foods that you ate during this time?

REFERENCES

- Aaron, J. I., Mela, D. J., & Evans, R. E. (1994). The influences of attitudes, beliefs, and label information on perceptions of reduced-fat spread. *Appetite*, 22, 25–37.
- Abraira, V. E., & Ginty, D. D. (2013). The sensory neurons of touch. *Neuron*, 79, 618–639.
- Ayabe-Kanamura, S., Saito, S., Distel, H., Martínez-Gómez, M., & Hudson, R. (1998). Differences and similarities in the perception of everyday odors: A Japanese-German cross-cultural study. *Annals of the New York Academy of Sciences*, 855, 694–700.
- Chen, Q., Deng, H., Brauth, S. E., Ding, L., & Tang, Y. (2012). Reduced performance of prey targeting in pit vipers with contralaterally occluded infrared and visual senses. *PloS ONE*, 7(5), e34989. doi:10.1371/journal.pone.0034989
- Comfort, A. (1971). Likelihood of human pheromones. *Nature*, 230, 432–479.
- Correll, J., Park, B., Judd, C. M., & Wittenbrink, B. (2002). The police officer's dilemma: Using ethnicity to disambiguate potentially threatening individuals. *Journal of Personality and Social Psychology*, 83, 1314–1329.
- Correll, J., Urland, G. R., & Ito, T. A. (2006). Event-related potentials and the decision to shoot: The role of threat perception and cognitive control. *The Journal of Experimental Social Psychology*, 42, 120–128.
- Dunkle T. (1982). The sound of silence. *Science*, 82, 30–33.
- Fawcett, S. L., Wang, Y., & Birch, E. E. (2005). The critical period for susceptibility of human stereopsis. *Investigative Ophthalmology and Visual Science*, 46, 521–525.
- Furlow, F. B. (1996, 2012). The smell of love. Retrieved from <http://www.psychologytoday.com/articles/200910/the-smell-love>
- Galanter, E. (1962). Contemporary Psychophysics. In R. Brown, E. Galanter, E. H. Hess, & G. Mandler (Eds.), *New directions in psychology*. New York, NY: Holt, Rinehart & Winston.
- Garland, E. L. (2012). Pain processing in the human nervous system: A selective review of nociceptive and biobehavioral pathways. *Primary Care*, 39, 561–571.
- Goolkasian, P. & Woodbury, C. (2010). Priming effects with ambiguous figures. *Attention, Perception & Psychophysics*, 72, 168–178.
- Grothe, B., Pecka, M., & McAlpine, D. (2010). Mechanisms of sound localization in mammals. *Physiological Reviews*, 90, 983–1012.
- Hartline, P. H., Kass, L., & Loop, M. S. (1978). Merging of modalities in the optic tectum: Infrared and visual integration in rattlesnakes. *Science*, 199, 1225–1229.

- Kaiser, P. K. (1997). *The joy of visual perception: A web book*. Retrieved from <http://www.yorku.ca/eye/noframes.htm>
- Khan, S., & Chang, R. (2013). Anatomy of the vestibular system: A review. *NeuroRehabilitation*, 32, 437–443.
- Kinnamon, S. C., & Vandenbeuch, A. (2009). Receptors and transduction of umami taste stimuli. *Annals of the New York Academy of Sciences*, 1170, 55–59.
- Kunst-Wilson, W. R., & Zajonc, R. B. (1980). Affective discrimination of stimuli that cannot be recognized. *Science*, 207, 557–558.
- Lackner, J. R., & DiZio, P. (2005). Vestibular, proprioceptive, and haptic contributions to spatial orientation. *Annual Review of Psychology*, 56, 115–147.
- Land, E. H. (1959). Color vision and the natural image. Part 1. *Proceedings of the National Academy of Science*, 45(1), 115–129.
- Liem, D. G., Westerbeek, A., Wolterink, S., Kok, F. J., & de Graaf, C. (2004). Sour taste preferences of children relate to preference for novel and intense stimuli. *Chemical Senses*, 29, 713–720.
- Lodovichi, C., & Belluscio, L. (2012). Odorant receptors in the formation of olfactory bulb circuitry. *Physiology*, 27, 200–212.
- Loersch, C., Durso, G. R. O., & Petty, R. E. (2013). Vicissitudes of desire: A matching mechanism for subliminal persuasion. *Social Psychological and Personality Science*, 4(5), 624–631.
- Maffei, A., Haley, M., & Fontanini, A. (2012). Neural processing of gustatory information in insular circuits. *Current Opinion in Neurobiology*, 22, 709–716.
- Milner, A. D., & Goodale, M. A. (2008). Two visual systems re-viewed. *Neuropsychological*, 46, 774–785.
- Mizushige, T., Inoue, K., Fushiki, T. (2007). Why is fat so tasty? Chemical reception of fatty acid on the tongue. *Journal of Nutritional Science and Vitaminology*, 53, 1–4.
- Most, S. B., Simons, D. J., Scholl, B. J., & Chabris, C. F. (2000). Sustained inattention blindness: The role of location in the detection of unexpected dynamic events. *PSYCHE*, 6(14).
- Nelson, M. R. (2008). The hidden persuaders: Then and now. *Journal of Advertising*, 37(1), 113–126.
- Niimura, Y., & Nei, M. (2007). Extensive gains and losses of olfactory receptor genes in mammalian evolution. *PLoS ONE*, 2, e708.
- Okawa, H., & Sampath, A. P. (2007). Optimization of single-photon response transmission at the rod-to-rod bipolar synapse. *Physiology*, 22, 279–286.
- Payne, B. K. (2001). Prejudice and perception: The role of automatic and controlled processes in misperceiving a weapon. *Journal of Personality and Social Psychology*, 81, 181–192.
- Payne, B. K., Shimizu, Y., & Jacoby, L. L. (2005). Mental control and visual illusions: Toward explaining race-biased weapon misidentifications. *Journal of Experimental Social Psychology*, 41, 36–47.
- Peck, M. (2012, July 19). *How a movie changed one man's vision forever*. Retrieved from <http://www.bbc.com/future/story/20120719-awoken-from-a-2d-world>

- Peterson, M. A., & Gibson, B. S. (1994). Must figure-ground organization precede object recognition? An assumption in peril. *Psychological Science*, 5, 253–259.
- Petho, G., & Reeh, P. W. (2012). Sensory and signaling mechanisms of bradykinin, eicosanoids, platelet-activating factor, and nitric oxide in peripheral nociceptors. *Physiological Reviews*, 92, 1699–1775.
- Proske, U. (2006). Kinesthesia: The role of muscle receptors. *Muscle & Nerve*, 34, 545–558.
- Proske, U., & Gandevia, S. C. (2012). The proprioceptive senses: Their roles in signaling body shape, body position and movement, and muscle force. *Physiological Reviews*, 92, 1651–1697.
- Purvis, K., & Haynes, N. B. (1972). The effect of female rat proximity on the reproductive system of male rats. *Physiology & Behavior*, 9, 401–407.
- Radel, R., Sarrazin, P., Legrain, P., & Gobancé, L. (2009). Subliminal priming of motivational orientation in educational settings: Effect on academic performance moderated by mindfulness. *Journal of Research in Personality*, 43(4), 1–18.
- Rauschecker, J. P., & Tian, B. (2000). Mechanisms and streams for processing “what” and “where” in auditory cortex. *Proceedings of the National Academy of Sciences, USA*, 97, 11800–11806.
- Renier, L. A., Anurova, I., De Volder, A. G., Carlson, S., VanMeter, J., & Rauschecker, J. P. (2009). Multisensory integration of sounds and vibrotactile stimuli in processing streams for “what” and “where.” *Journal of Neuroscience*, 29, 10950–10960.
- Rensink, R. A. (2004). Visual sensing without seeing. *Psychological Science*, 15, 27–32.
- Rock, I., & Palmer, S. (1990). The legacy of Gestalt psychology. *Scientific American*, 262, 84–90.
- Roper, S. D. (2013). Taste buds as peripheral chemosensory receptors. *Seminars in Cell & Developmental Biology*, 24, 71–79.
- Russell, M. J. (1976). Human olfactory communication. *Nature*, 260, 520–522.
- Sachs, B. D. (1997). Erection evoked in male rats by airborne scent from estrous females. *Physiology & Behavior*, 62, 921–924.
- Segall, M. H., Campbell, D. T., & Herskovits, M. J. (1963). Cultural differences in the perception of geometric illusions. *Science*, 139, 769–771.
- Segall, M. H., Campbell, D. T., & Herskovits, M. J. (1966). *The influence of culture on visual perception*. Indianapolis: Bobbs-Merrill.
- Segall, M. H., Dasen, P. P., Berry, J. W., & Poortinga, Y. H. (1999). *Human behavior in global perspective* (2nd ed.). Boston: Allyn & Bacon.
- Semaan, M. T., & Megerian, C. A. (2010). Contemporary perspectives on the pathophysiology of Meniere’s disease: implications for treatment. *Current opinion in Otolaryngology & Head and Neck Surgery*, 18(5), 392–398.
- Shamma, S. (2001). On the role of space and time in auditory processing. *Trends in Cognitive Sciences*, 5, 340–348.
- Simons, D. J., & Chabris, C. F. (1999). Gorillas in our midst: Sustained inattention blindness for dynamic events. *Perception*, 28, 1059–1074.

- Spors, H., Albeanu, D. F., Murthy, V. N., Rinberg, D., Uchida, N., Wachowiak, M., & Friedrich, R. W. (2013). Illuminating vertebrate olfactory processing. *Journal of Neuroscience*, 32, 14102–14108.
- Spray, D. C. (1986). Cutaneous temperature receptors. *Annual Review of Physiology*, 48, 625–638.
- Strain, G. M. (2003). *How well do dogs and other animals hear?* Retrieved from <http://www.lsu.edu/deafness/HearingRange.html>
- Swets, J. A. (1964). Signal detection and recognition by human observers. *Psychological Bulletin*, 60, 429–441.
- Ungerleider, L. G., & Haxby, J. V. (1994). ‘What’ and ‘where’ in the human brain. *Current Opinion in Neurobiology*, 4, 157–165.
- U.S. National Library of Medicine. (2013). Genetics home reference: Congenital insensitivity to pain. Retrieved from <http://ghr.nlm.nih.gov/condition/congenital-insensitivity-to-pain>
- Vecera, S. P., & O’Reilly, R. C. (1998). Figure-ground organization and object recognition processes: An interactive account. *Journal of Experimental Psychology-Human Perception and Performance*, 24, 441–462.
- Wakakuwa, M., Stavenga, D. G., & Arikawa, K. (2007). Spectral organization of ommatidia in flower-visiting insects. *Photochemistry and Photobiology*, 83, 27–34.
- Weller, A. (1998). Human pheromones: Communication through body odour. *Nature*, 392, 126–127.
- Wells, D. L. (2010). Domestic dogs and human health: An overview. *British Journal of Health Psychology*, 12, 145–156.
- Wolfgang-Kimball, D. (1992). Pheromones in humans: myth or reality?. Retrieved from <http://www.anapsid.org/pheromones.html>
- Wysocki, C. J., & Preti, G. (2004). Facts, fallacies, fears, and frustrations with human pheromones. *The Anatomical Record Part A: Discoveries in Molecular, Cellular, and Evolutionary Biology*, 281, 1201–1211.

PART VI

GROWTH AND DEVELOPMENT



How have you changed since childhood? How are you the same? What will your life be like twenty-five years from now? Fifty years from now? Lifespan development studies how you change as well as how you remain the same over the course of your life. (credit: modification of work by Giles Cook)

Welcome to the story of your life. In this chapter we explore the fascinating tale of how you have grown and developed into the person you are today. We also look at some ideas about who you will grow into tomorrow. Yours is a story of **lifespan development**, *from the start of life to the end*.

The process of human growth and development is more obvious in infancy and childhood, yet your development is happening at this moment and will continue, minute by minute, for the rest of your life. Who you are today and who you will be in the future depends on a blend of genetics, environment, culture, relationships, and more, as you continue through each phase of life. You have experienced firsthand much of what is discussed in this chapter. Now consider what psychological science has to say about your physical, cognitive, and psychosocial development, from the womb to the tomb.

27.

WHAT IS GROWTH AND DEVELOPMENT?

Learning Objectives

By the end of this section, you will be able to:

- Define and distinguish between the three domains of development: physical, cognitive, and psychosocial
- Discuss the normative approach to development
- Understand the three major issues in development: continuity and discontinuity, one common course of development or many unique courses of development, and nature versus nurture

My heart leaps up when I behold

A rainbow in the sky:

So was it when my life began;

So is it now I am a man;

So be it when I shall grow old,

Or let me die!

The Child is father of the Man;

I could wish my days to be

Bound each to each by natural piety. (Wordsworth, 1802)

In this poem, William Wordsworth writes, “The child is father of the man.” What does this seemingly

incongruous statement mean, and what does it have to do with lifespan development? Wordsworth might be suggesting that the person he is as an adult depends largely on the experiences he had in childhood. Consider the following questions: To what extent is the adult you are today influenced by the child you once were? To what extent is a child fundamentally different from the adult he grows up to be?

These are the types of questions **developmental psychologists** *try to answer, by studying how humans change and grow from conception through childhood, adolescence, adulthood, and death*. They view development as a lifelong process that can be studied scientifically across three developmental domains—physical, cognitive, and psychosocial development. **Physical development** *involves growth and changes in the body and brain, the senses, motor skills, and health and wellness*. **Cognitive development** *involves learning, attention, memory, language, thinking, reasoning, and creativity*. **Psychosocial development** *involves emotions, personality, and social relationships*. We refer to these domains throughout the chapter.

Research Methods in Developmental Psychology

You’ve learned about a variety of research methods used by psychologists. Developmental psychologists use many of these approaches in order to better understand how individuals change mentally and physically over time. These methods include naturalistic observations, case studies, surveys, and experiments, among others.

Naturalistic observations involve *observing behavior in its natural context*. A developmental psychologist might observe how children behave on a playground, at a daycare center, or in the child’s own home. While this research approach provides a glimpse into how children behave in their natural settings, researchers have very little control over the types and/or frequencies of displayed behavior.

In a **case study**, *developmental psychologists collect a great deal of information from one individual in order to better understand physical and psychological changes over the lifespan*. This particular approach is an excellent way to better understand individuals, who are exceptional in some way, but it is especially prone to researcher bias in interpretation, and it is difficult to generalize conclusions to the larger population.

In one classic example of this research method being applied to a study of lifespan development, Sigmund Freud analyzed the development of a child known as “Little Hans” (Freud, 1909/1949). Freud’s findings helped inform his theories of psychosexual development in children, which you will learn about later in this chapter. Little Genie, the subject of a case study discussed in the chapter on thinking and intelligence, provides another example of how psychologists examine developmental milestones through detailed research on a single individual. In Genie’s case, her neglectful and abusive upbringing led to her being unable to speak until, at age 13, she was removed from that harmful environment. As she learned to use language, psychologists were able to compare how her language acquisition abilities differed when occurring in her late-stage development compared to the typical acquisition of those skills during the ages of infancy through early childhood (Fromkin, Krashen, Curtiss, Rigler, & Rigler, 1974; Curtiss, 1981).

The **survey method** *asks individuals to self-report important information about their thoughts, experiences,*

and beliefs. This particular method can provide large amounts of information in relatively short amounts of time; however, the validity of data collected in this way relies on honest self-reporting, and the data is relatively shallow when compared to the depth of information collected in a case study.

Experiments involve significant control over extraneous variables and manipulation of the independent variable. As such, **experimental research** *allows developmental psychologists to make causal statements about certain variables that are important for the developmental process*. Because experimental research must occur in a controlled environment, researchers must be cautious about whether behaviors observed in the laboratory translate to an individual's natural environment.

Later in this chapter, you will learn about several experiments in which toddlers and young children observe scenes or actions so that researchers can determine at what age specific cognitive abilities develop. For example, children may observe a quantity of liquid poured from a short, fat glass into a tall, skinny glass. As the experimenters question the children about what occurred, the subjects' answers help psychologists understand at what age a child begins to comprehend that the volume of liquid remained the same although the shapes of the containers differ.

Across these three domains—physical, cognitive, and psychosocial—the **normative approach** to development is also discussed. This approach asks, “*What is normal development?*” In the early decades of the 20th century, normative psychologists studied large numbers of children at various ages to determine norms (i.e., average ages) of when most children reach specific developmental milestones in each of the three domains (Gesell, 1933, 1939, 1940; Gesell & Ilg, 1946; Hall, 1904). Although children develop at slightly different rates, we can use these age-related averages as general guidelines to compare children with same-age peers to determine the approximate ages they should reach specific normative events called developmental milestones (e.g., crawling, walking, writing, dressing, naming colors, speaking in sentences, and starting puberty).

Not all normative events are universal, meaning they are not experienced by all individuals across all cultures. Biological milestones, such as puberty, tend to be universal, but social milestones, such as the age when children begin formal schooling, are not necessarily universal; instead, they affect most individuals in a particular culture (Gesell & Ilg, 1946). For example, in developed countries children begin school around 5 or 6 years old, but in developing countries, like Nigeria, children often enter school at an advanced age, if at all (Huebler, 2005; United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2013).

To better understand the normative approach, imagine two new mothers, Louisa and Kimberly, who are close friends and have children around the same age. Louisa's daughter is 14 months old, and Kimberly's son is 12 months old. According to the normative approach, the average age a child starts to walk is 12 months. However, at 14 months Louisa's daughter still isn't walking. She tells Kimberly she is worried that something might be wrong with her baby. Kimberly is surprised because her son started walking when he was only 10 months old. Should Louisa be worried? Should she be concerned if her daughter is not walking by 15 months or 18 months?

The Centers for Disease Control and Prevention (CDC) describes the developmental milestones for children from 2 months through 5 years old. After reviewing the information, take this quiz to see how well you recall what you've learned. If you are a parent with concerns about your child's development, contact your pediatrician: [CDC's Developmental Milestones](#).

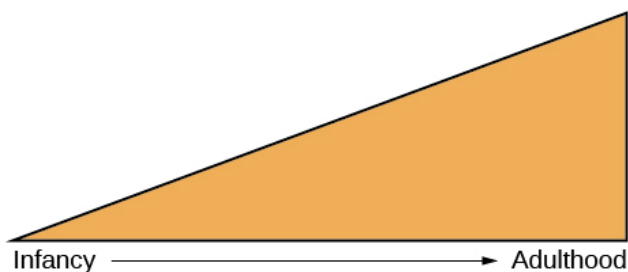
Issues in Developmental Psychology

There are many different theoretical approaches regarding human development. As we evaluate them in this chapter, recall that **developmental psychology** *focuses on how people change, and keep in mind that all the approaches that we present in this chapter address questions of change*: Is the change smooth or uneven (continuous versus discontinuous)? Is this pattern of change the same for everyone, or are there many different patterns of change (one course of development versus many courses)? How do genetics and environment interact to influence development (nature versus nurture)?

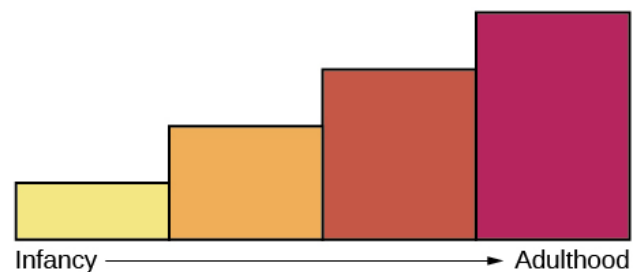
Is Development Continuous or Discontinuous?

Continuous development *views development as a cumulative process, gradually improving on existing skills*. With this type of development, there is gradual change. Consider, for example, a child's physical growth: adding inches to her height year by year. In contrast, theorists who view development as **discontinuous (development)** believe that *development takes place in unique stages; it occurs at specific times or ages*. With this type of development, the change is more sudden, such as an infant's ability to conceive object permanence. The concept of continuous development can be visualized as a smooth slope of progression, whereas discontinuous development sees growth in more discrete stages.

Continuous Development



Discontinuous Development



The concept of continuous development can be visualized as a smooth slope of progression from infancy to adulthood, whereas discontinuous development sees growth in more discrete stages.

Is There One Course of Development or Many?

Is development essentially the same, or universal, for all children (i.e., there is one course of development) or does development follow a different course for each child, depending on the child's specific genetics and environment (i.e., there are many courses of development)? Do people across the world share more similarities or more differences in their development? How much do culture and genetics influence a child's behavior?

Stage theories hold that the sequence of development is universal. For example, in cross-cultural studies of language development, children from around the world reach language milestones in a similar sequence (Gleitman & Newport, 1995). Infants in all cultures coo before they babble. They begin babbling at about the same age and utter their first word around 12 months old. Yet we live in diverse contexts that have a unique effect on each of us. For example, researchers once believed that motor development follows one course for all children regardless of culture. However, child care practices vary by culture, and different practices have been found to accelerate or inhibit the achievement of developmental milestones such as sitting, crawling, and walking (Karasik, Adolph, Tamis-LeMonda, & Bornstein, 2010).

For instance, let's look at the Aché society in Paraguay. They spend a significant amount of time foraging in forests. While foraging, Aché mothers carry their young children, rarely putting them down in order to protect them from getting hurt in the forest. Consequently, their children walk much later; they walk around 23–25 months old, in comparison to infants in Western cultures who begin to walk around 12 months old. However, as Aché children become older, they are allowed more freedom to move about, and by about age 9, their motor skills surpass those of U.S. children of the same age; Aché children are able to climb trees up to 25 feet tall and use machetes to chop their way through the forest (Kaplan & Dove, 1987). As you can see, our development is influenced by multiple contexts, so the timing of basic motor functions may vary across cultures. However, the functions themselves are present in all societies.



(a)



(b)

All children across the world love to play. Whether in (a) Florida or (b) South Africa, children enjoy exploring sand, sunshine, and the sea. (credit a: modification of work by “Visit St. Pete/Clearwater”/Flickr; credit b: modification of work by “stringer_bel”/Flickr)

How Do Nature and Nurture Influence Development?

Are we who we are because of **nature** (*biology and genetics*), or are we who we are because of **nurture** (*our environment and culture*)? This longstanding question is known in psychology as the **nature versus nurture debate**. *It seeks to understand how our personalities and traits are the product of our genetic makeup and biological factors, and how they are shaped by our environment, including our parents, peers, and culture.* For instance, why do biological children sometimes act like their parents—is it because of genetics or because of early childhood environment and what the child has learned from the parents? What about children who are adopted—are they more like their biological families or more like their adoptive families? And how can siblings from the same family be so different?

We are all born with specific genetic traits inherited from our parents, such as eye color, height, and certain personality traits. Beyond our basic genotype, however, there is a deep interaction between our genes and our environment: Our unique experiences in our environment influence whether and how particular traits are expressed, and at the same time, our genes influence how we interact with our environment (Diamond, 2009; Lobo, 2008). This chapter will show that there is a reciprocal interaction between nature and nurture as they both shape who we become, but the debate continues as to the relative contributions of each.

The Achievement Gap: How Does Socioeconomic Status Affect Development?

The **achievement gap** refers to *the persistent difference in grades, test scores, and graduation rates that exist among students of different ethnicities, races, and—in certain subjects—sexes* (Winerman, 2011). Research suggests that these achievement gaps are strongly influenced by differences in socioeconomic factors that exist among the families of these children. While the researchers acknowledge that programs aimed at reducing such socioeconomic discrepancies would likely aid in equalizing the aptitude and performance of children from different backgrounds, they recognize that such large-scale interventions would be difficult to achieve. Therefore, it is recommended that programs aimed at fostering aptitude and achievement among disadvantaged children may be the best option for dealing with issues related to academic achievement gaps (Duncan & Magnuson, 2005).

Low-income children perform significantly more poorly than their middle- and high-income peers on a number of educational variables: They have significantly lower standardized test scores, graduation rates, and college entrance rates, and they have much higher school dropout rates. There have been attempts to correct the achievement gap through state and federal legislation, but what if the problems start before the children even enter school?

Psychologists Betty Hart and Todd Risley (2006) spent their careers looking at early language ability and progression of children in various income levels. In one longitudinal study, they found that although all the

parents in the study engaged and interacted with their children, middle- and high-income parents interacted with their children differently than low-income parents. After analyzing 1,300 hours of parent-child interactions, the researchers found that middle- and high-income parents talk to their children significantly more, starting when the children are infants. By 3 years old, high-income children knew almost double the number of words known by their low-income counterparts, and they had heard an estimated total of 30 million more words than their low-income counterparts (Hart & Risley, 2003). And the gaps only become more pronounced. Before entering kindergarten, high-income children score 60% higher on achievement tests than their low-income peers (Lee & Burkam, 2002).

There are solutions to this problem. At the University of Chicago, experts are working with low-income families, visiting them at their homes, and encouraging them to speak more to their children on a daily and hourly basis. Other experts are designing preschools in which students from diverse economic backgrounds are placed in the same classroom. In this research, low-income children made significant gains in their language development, likely as a result of attending the specialized preschool (Schechter & Byeb, 2007). What other methods or interventions could be used to decrease the achievement gap? What types of activities could be implemented to help the children of your community or a neighboring community?

Summary

Lifespan development explores how we change and grow from conception to death. This field of psychology is studied by developmental psychologists. They view development as a lifelong process that can be studied scientifically across three developmental domains: physical, cognitive development, and psychosocial. There are several theories of development that focus on the following issues: whether development is continuous or discontinuous, whether development follows one course or many, and the relative influence of nature versus nurture on development.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it

online here:

<https://louis.pressbooks.pub/intropsychology/?p=595#h5p-154>

Critical Thinking Questions

Describe the nature versus nurture controversy, and give an example of a trait and how it might be influenced by each.

The nature versus nurture controversy seeks to understand whether our personalities and traits are the product of our genetic makeup and biological factors, or whether they are shaped by our environment, which includes such things as our parents, peers, and culture. Today, psychologists agree that both nature and nurture interact to shape who we become, but the debate over the relative contributions of each continues. An example would be a child learning to walk: Nature influences when the physical ability occurs, but culture can influence when a child masters this skill, as in Aché culture.

Compare and contrast continuous and discontinuous development.

Continuous development sees our development as a cumulative process: Changes are gradual. On the other hand, discontinuous development sees our development as taking place in specific steps or stages: Changes are sudden.

Why should developmental milestones only be used as a general guideline for normal child development?

Children develop at different rates. For example, some children may walk and talk as early as 8 months old, while others may not do so until well after their first birthday. Each child's unique contexts will influence when he reaches these milestones.

Personal Application Questions

How are you different today from the person you were at 6 years old? What about at 16 years old? How are you the same as the person you were at those ages?

Your 3-year-old daughter is not yet potty trained. Based on what you know about the normative approach, should you be concerned? Why or why not?

28.

LIFESPAN THEORIES

Learning Objectives

By the end of this section, you will be able to:

- Discuss Freud's theory of psychosexual development
- Describe the major tasks of child and adult psychosocial development according to Erikson
- Discuss Piaget's view of cognitive development and apply the stages to understanding childhood cognition
- Describe Kohlberg's theory of moral development

There are many theories regarding how babies and children grow and develop into happy, healthy adults. We explore several of these theories in this section.

Psychosexual Theory of Development

Sigmund Freud (1856–1939) believed that personality develops during early childhood. For Freud, childhood experiences shape our personalities and behavior as adults. Freud viewed development as discontinuous; he believed that each of us must pass through a series of stages during childhood, and that if we lack proper nurturance and parenting during a stage, we may become stuck, or fixated, in that stage. Freud's stages are called the stages of psychosexual development. According to Freud, children's pleasure-seeking urges are focused on a different area of the body, called an erogenous zone, at each of the five stages of development: oral, anal, phallic, latency, and genital.

While most of Freud's ideas have not found support in modern research, we cannot discount the contributions that Freud has made to the field of psychology. Psychologists today dispute Freud's psychosexual stages as a legitimate explanation for how one's personality develops, but what we can take away from Freud's

theory is that personality is shaped, in some part, by experiences we have in childhood. These stages are discussed in detail in the chapter on personality.

Psychosocial Theory of Development

Erik Erikson (1902–1994), another *stage theorist*, took Freud's theory and modified it as *psychosocial theory*. Erikson's psychosocial development theory emphasizes the social nature of our development rather than its sexual nature. While Freud believed that personality is shaped only in childhood, Erikson proposed that personality development takes place all through the lifespan. Erikson suggested that how we interact with others is what affects our sense of self, or what he called the ego identity.



Erik Erikson proposed the psychosocial theory of development. In each stage of Erikson's theory, there is a psychosocial task that we must master in order to feel a sense of competence.

Erikson proposed that we are motivated by a need to achieve competence in certain areas of our lives. According to **psychosocial theory**, *we experience eight stages of development over our lifespan, from infancy through late adulthood*. At each stage there is a conflict, or task, that we need to resolve. Successful completion of each developmental task results in a sense of competence and a healthy personality. Failure to master these tasks leads to feelings of inadequacy.

According to Erikson (1963), trust is the basis of our development during infancy (birth to 12 months). Therefore, the primary task of this stage is trust versus mistrust. Infants are dependent upon their caregivers, so caregivers who are responsive and sensitive to their infant's needs help their baby to develop a sense of trust;

their baby will see the world as a safe, predictable place. Unresponsive caregivers who do not meet their baby's needs can engender feelings of anxiety, fear, and mistrust; their baby may see the world as unpredictable.

As toddlers (ages 1–3 years) begin to explore their world, they learn that they can control their actions and act on the environment to get results. They begin to show clear preferences for certain elements of the environment, such as food, toys, and clothing. A toddler's main task is to resolve the issue of autonomy versus shame and doubt, by working to establish independence. This is the “me do it” stage. For example, we might observe a budding sense of autonomy in a 2-year-old child who wants to choose her clothes and dress herself. Although her outfits might not be appropriate for the situation, her input in such basic decisions has an effect on her sense of independence. If denied the opportunity to act on her environment, she may begin to doubt her abilities, which could lead to low self-esteem and feelings of shame.

Once children reach the preschool stage (ages 3–6 years), they are capable of initiating activities and asserting control over their world through social interactions and play. According to Erikson, preschool children must resolve the task of initiative versus guilt. By learning to plan and achieve goals while interacting with others, preschool children can master this task. Those who do will develop self-confidence and feel a sense of purpose. Those who are unsuccessful at this stage—with their initiative misfiring or stifled—may develop feelings of guilt. How might over-controlling parents stifle a child's initiative?

During the elementary school stage (ages 6–12), children face the task of industry versus inferiority. Children begin to compare themselves to their peers to see how they measure up. They either develop a sense of pride and accomplishment in their schoolwork, sports, social activities, and family life, or they feel inferior and inadequate when they don't measure up. What are some things parents and teachers can do to help children develop a sense of competence and a belief in themselves and their abilities?

In adolescence (ages 12–18), children face the task of identity versus role confusion. According to Erikson, an adolescent's main task is developing a sense of self. Adolescents struggle with questions such as “Who am I?” and “What do I want to do with my life?” Along the way, most adolescents try on many different selves to see which ones fit. Adolescents who are successful at this stage have a strong sense of identity and are able to remain true to their beliefs and values in the face of problems and other people's perspectives. What happens to apathetic adolescents, who do not make a conscious search for identity, or those who are pressured to conform to their parents' ideas for the future? These teens will have a weak sense of self and experience role confusion. They are unsure of their identity and confused about the future.

People in early adulthood (i.e., 20s through early 40s) are concerned with intimacy versus isolation. After we have developed a sense of self in adolescence, we are ready to share our life with others. Erikson said that we must have a strong sense of self before developing intimate relationships with others. Adults who do not develop a positive self-concept in adolescence may experience feelings of loneliness and emotional isolation.

When people reach their 40s, they enter the time known as middle adulthood, which extends to the mid-60s. The social task of middle adulthood is generativity versus stagnation. Generativity involves finding your life's work and contributing to the development of others, through activities such as volunteering, mentoring, and

raising children. Those who do not master this task may experience stagnation, having little connection with others and little interest in productivity and self-improvement.

From the mid-60s to the end of life, we are in the period of development known as late adulthood. Erikson's task at this stage is called integrity versus despair. He said that people in late adulthood reflect on their lives and feel either a sense of satisfaction or a sense of failure. People who feel proud of their accomplishments feel a sense of integrity, and they can look back on their lives with few regrets. However, people who are not successful at this stage may feel as if their life has been wasted. They focus on what "would have," "should have," and "could have" been. They face the end of their lives with feelings of bitterness, depression, and despair.

Erikson's Psychosocial Stages of Development

Stage	Age (years)	Developmental Task	Description
1	0–1	Trust vs. mistrust	Trust (or mistrust) that basic needs, such as nourishment and affection, will be met
2	1–3	Autonomy vs. shame/doubt	Develop a sense of independence in many tasks
3	3–6	Initiative vs. guilt	Take initiative on some activities—may develop guilt when unsuccessful or boundaries overstepped
4	7–11	Industry vs. inferiority	Develop self-confidence in abilities when competent or a sense of inferiority when not
5	12–18	Identity vs. confusion	Experiment with and develop identity and roles
6	19–29	Intimacy vs. isolation	Establish intimacy and relationships with others
7	30–64	Generativity vs. stagnation	Contribute to society and be part of a family
8	65+	Integrity vs. despair	Assess and make sense of life and the meaning of contributions

Cognitive Theory of Development

Jean Piaget (1896–1980) is *another stage theorist who studied childhood development*. Instead of approaching development from a psychoanalytical or psychosocial perspective, Piaget focused on children's cognitive growth. He believed that thinking is a central aspect of development and that children are naturally inquisitive. However, he said that children do not think and reason like adults (Piaget, 1930, 1932). His theory of cognitive development holds that our cognitive abilities develop through specific stages, which exemplifies the discontinuity approach to development. As we progress to a new stage, there is a distinct shift in how we think and reason.



Jean Piaget spent over 50 years studying children and how their minds develop.

Piaget said that children develop schemata to help them understand the world. **Schemata** are concepts (*mental models*) that are used to help us categorize and interpret information. By the time children have reached adulthood, they have created schemata for almost everything. When children learn new information, they adjust their schemata through two processes: assimilation and accommodation. First, they assimilate new information or experiences in terms of their current schemata: **assimilation** is *when they take in information that is comparable to what they already know*. **Accommodation** describes *when they change their schemata based on new information*. This process continues as children interact with their environment.

For example, 2-year-old Blake learned the schema for dogs because his family has a Labrador retriever. When Blake sees other dogs in his picture books, he says, “Look mommy, dog!” Thus, he has assimilated them into his schema for dogs. One day, Blake sees a sheep for the first time and says, “Look mommy, dog!” Having a basic schema that a dog is an animal with four legs and fur, Blake thinks all furry, four-legged creatures are dogs. When Blake’s mom tells him that the animal he sees is a sheep, not a dog, Blake must accommodate his schema for dogs to include more information based on his new experiences. Blake’s schema for dog was too broad, since not all furry, four-legged creatures are dogs. He now modifies his schema for dogs and forms a new one for sheep.

Like Freud and Erikson, Piaget thought development unfolds in a series of stages approximately associated

with age ranges. He proposed a theory of cognitive development that unfolds in four stages: sensorimotor, preoperational, concrete operational, and formal operational.

Piaget's Stages of Cognitive Development

Age (years)	Stage	Description	Developmental issues
0–2	Sensorimotor	World experienced through senses and actions	Object permanence Stranger anxiety Pretend play
2–6	Preoperational	Use words and images to represent things, but lack logical reasoning	Egocentrism Language development Conservation
7–11	Concrete operational	Understand concrete events and analogies logically; perform arithmetical operations	Mathematical transformations
12+	Formal operational	Formal operations Utilize abstract reasoning	Abstract logic Moral reasoning

The first stage is the **sensorimotor stage**, *a stage of development which lasts from birth to about 2 years old. During this stage, children learn about the world through their senses and motor behavior.* Young children put objects in their mouths to see if the items are edible, and once they can grasp objects, they may shake or bang them to see if they make sounds. Between 5 and 8 months old, the child develops **object permanence**, which is *the understanding that even if something is out of sight, it still exists* (Bogartz, Shinskey, & Schilling, 2000). According to Piaget, young infants do not remember an object after it has been removed from sight. Piaget studied infants' reactions when a toy was first shown to an infant and then hidden under a blanket. Infants who had already developed object permanence would reach for the hidden toy, indicating that they knew it still existed, whereas infants who had not developed object permanence would appear confused.

Please take a few minutes to view this brief video demonstrating different children's ability to understand object permanence: [Piaget – Stage 1 – Sensorimotor stage : Object Permanence](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=597#oembed-1>

In Piaget's view, around the same time children develop object permanence, they also begin to exhibit **stranger anxiety**, which is *a fear of unfamiliar people*. Babies may demonstrate this by crying and turning away from a stranger, by clinging to a caregiver, or by attempting to reach their arms toward familiar faces such as parents. Stranger anxiety results when a child is unable to assimilate the stranger into an existing schema; therefore, she can't predict what her experience with that stranger will be like, which results in a fear response.

Piaget's second stage is the **preoperational stage**, which is *from approximately 2 to 7 years old*. In this stage, children can use symbols to represent words, images, and ideas, which is why children in this stage engage in *pretend play*. A child's arms might become airplane wings as he zooms around the room, or a child with a stick might become a brave knight with a sword. Children also begin to use language in the preoperational stage, but they cannot understand adult logic or mentally manipulate information (the term *operational* refers to logical manipulation of information, so children at this stage are considered to be *pre-operational*). Children's logic is based on their own personal knowledge of the world so far, rather than on conventional knowledge. For example, Dad gave a slice of pizza to 10-year-old Keiko and another slice to her 3-year-old brother, Kenny. Kenny's pizza slice was cut into 5 pieces, so Kenny told his sister that he got more pizza than she did. Children in this stage cannot perform mental operations because they have not developed an understanding of conservation, which is the idea that even if you change the appearance of something, it is still equal in size as long as nothing has been removed or added.

This video shows a 4.5-year-old boy in the preoperational stage as he responds to Piaget's conservation tasks: [A typical child on Piaget's conservation tasks](#).





One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=597#oembed-2>

During this stage, we also expect children to display egocentrism, which means that the child is not able to take the perspective of others. A child at this stage thinks that everyone sees, thinks, and feels just as they do. Let's look at Kenny and Keiko again. Keiko's birthday is coming up, so their mom takes Kenny to the toy store to choose a present for his sister. He selects an Iron Man action figure for her, thinking that if he likes the toy, his sister will too. An egocentric child is not able to infer the perspective of other people and instead attributes his own perspective.

Piaget developed the Three-Mountain Task to determine the level of egocentrism displayed by children. Children view a three-dimensional mountain scene from one viewpoint and are asked what another person at a different viewpoint would see in the same scene. Watch the Three-Mountain Task in action in this short video from the University of Minnesota and the Science Museum of Minnesota: [Piaget's Mountains Task](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=597#oembed-3>

Piaget's third stage is the **concrete operational stage**, which occurs from about 7 to 11 years old. In this stage, children can think logically about real (concrete) events; they have a firm grasp on the use of numbers and start to employ memory strategies. They can perform mathematical operations and understand transformations, such as addition is the opposite of subtraction, and multiplication is the opposite of division. In this stage, children also master the concept of conservation: Even if something changes shape, its mass, volume, and number stay the same. For example, if you pour water from a tall, thin glass to a short, fat glass, you still have the same

amount of water. Remember Keiko and Kenny and the pizza? How did Keiko know that Kenny was wrong when he said that he had more pizza?

Children in the concrete operational stage also understand the principle of reversibility, which means that objects can be changed and then returned back to their original form or condition. Take, for example, water that you poured into the short, fat glass: You can pour water from the fat glass back into the thin glass and still have the same amount (minus a couple of drops).

The fourth, and last, stage in Piaget's theory is the **formal operational stage**, which is *from about age 11 to adulthood*. Whereas children in the concrete operational stage are able to think logically only about concrete events, children in the formal operational stage can also deal with abstract ideas and hypothetical situations. *Children in this stage can use abstract thinking to problem solve, look at alternative solutions, and test these solutions. In adolescence, a renewed egocentrism occurs.* For example, a 15-year-old with a very small pimple on her face might think it is huge and incredibly visible, under the mistaken impression that others must share her perceptions.

Beyond Formal Operational Thought

As with other major contributors to theories of development, several of Piaget's ideas have come under criticism based on the results of further research. For example, several contemporary studies support a model of development that is more continuous than Piaget's discrete stages (Courage & Howe, 2002; Siegler, 2005, 2006). Many others suggest that children reach cognitive milestones earlier than Piaget describes (Baillargeon, 2004; de Hevia & Spelke, 2010).

According to Piaget, the *highest level of cognitive development* is **formal operational thought**, which develops between 11 and 20 years old. However, many developmental psychologists disagree with Piaget, suggesting a fifth stage of cognitive development, known as the postformal stage (Basseches, 1984; Commons & Bressette, 2006; Sinnott, 1998). In postformal thinking, decisions are made based on situations and circumstances, and logic is integrated with emotion as adults develop principles that depend on contexts. One way that we can see the difference between an adult in postformal thought and an adolescent in formal operations is in terms of how they handle emotionally charged issues.

It seems that once we reach adulthood our problem-solving abilities change. As we attempt to solve problems, we tend to think more deeply about many areas of our lives, such as relationships, work, and politics (Labouvie-Vief & Diehl, 1999). Because of this, postformal thinkers are able to draw on past experiences to help them solve new problems. Problem-solving strategies using postformal thought vary, depending on the situation. What does this mean? Adults can recognize, for example, that what seems to be an ideal solution to a problem at work involving a disagreement with a colleague may not be the best solution to a disagreement with a significant other.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=597#h5p-156>

Theory of Moral Development

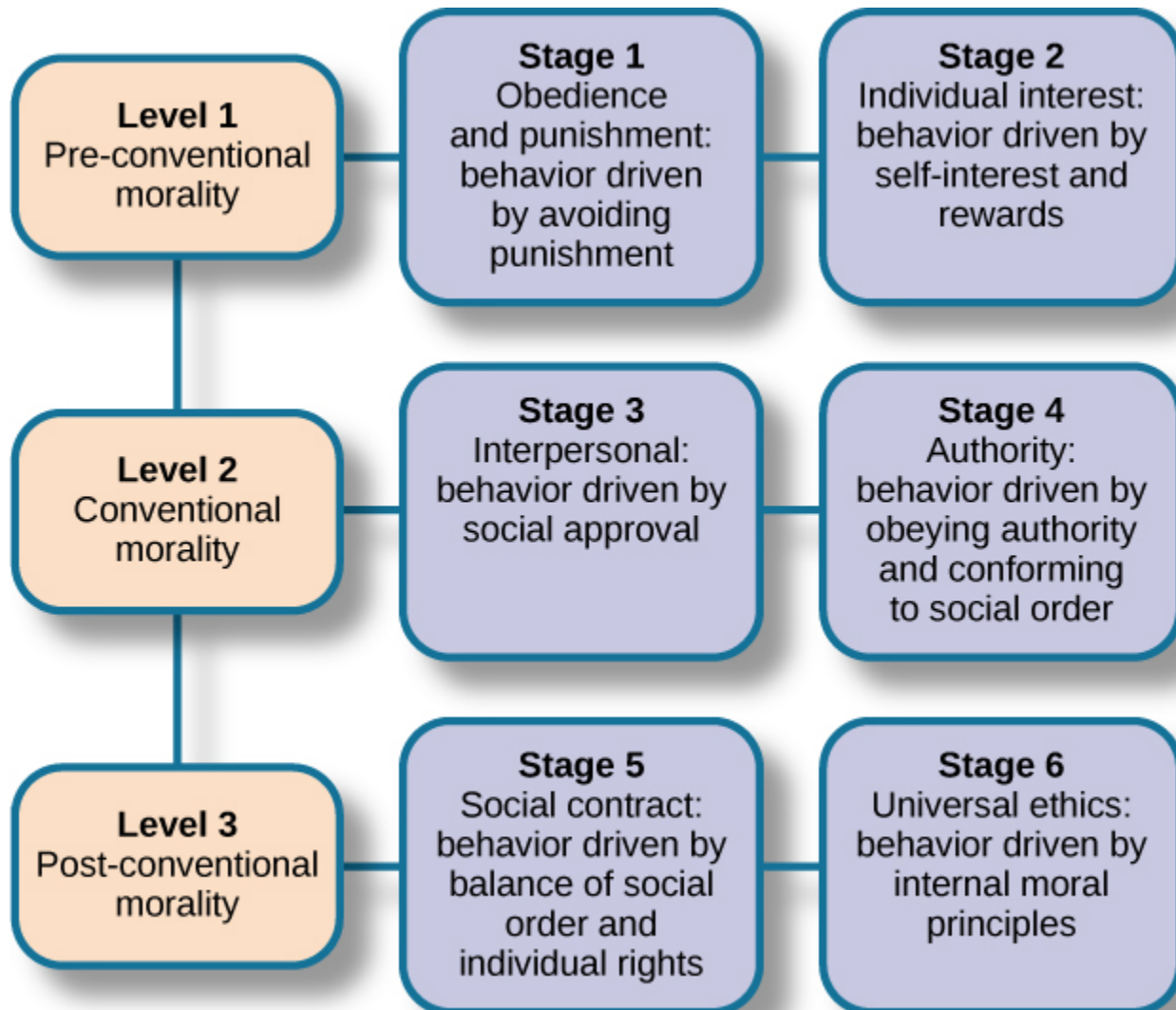
A major task beginning in childhood and continuing into adolescence is discerning right from wrong. Psychologist **Lawrence Kohlberg (1927–1987)** extended upon the foundation that Piaget built regarding cognitive development. Kohlberg *believed that moral development, like cognitive development, follows a series of stages*. To develop this theory, Kohlberg posed moral dilemmas to people of all ages, and then he analyzed their answers to find evidence of their particular stage of moral development. Before reading about the stages, take a minute to consider how you would answer one of Kohlberg’s best-known moral dilemmas, commonly known as the Heinz dilemma:

In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost him to make. He paid \$200 for the radium and charged \$2,000 for a small dose of the drug. The sick woman’s husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about \$1,000, which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said: “No, I discovered the drug and I’m going to make money from it.” So Heinz got desperate and broke into the man’s store to steal the drug for his wife. Should the husband have done that? (Kohlberg, 1969, p. 379)

How would you answer this dilemma? Kohlberg was not interested in whether you answer yes or no to the dilemma: Instead, he was interested in the reasoning behind your answer.

After presenting people with this and various other moral dilemmas, Kohlberg reviewed people’s responses and placed them in different stages of moral reasoning. According to Kohlberg, an individual progresses from the capacity for pre-conventional morality (before age 9) to the capacity for conventional morality (early adolescence), and toward attaining post-conventional morality (once formal operational thought is attained),

which only a few fully achieve. Kohlberg placed in the highest stage responses that reflected the reasoning that Heinz should steal the drug because his wife's life is more important than the pharmacist making money. The value of a human life overrides the pharmacist's greed.



Kohlberg identified three levels of moral reasoning: pre-conventional, conventional, and post-conventional. Each level is associated with increasingly complex stages of moral development.

It is important to realize that even those people who have the most sophisticated, post-conventional reasons for some choices may make other choices for the simplest of pre-conventional reasons. Many psychologists agree with Kohlberg's theory of moral development but point out that moral reasoning is very different from moral behavior. Sometimes what we say we would do in a situation is not what we actually do in that situation. In other words, we might "talk the talk," but not "walk the walk."

How does this theory apply to males and females? Kohlberg (1969) felt that more males than females move past stage four in their moral development. He went on to note that women seem to be deficient in their moral

reasoning abilities. These ideas were not well received by Carol Gilligan, a research assistant of Kohlberg's, who consequently developed her own ideas of moral development. In her groundbreaking book *In a Different Voice: Psychological Theory and Women's Development*, Gilligan (1982) criticized her former mentor's theory because it was based only on upper-class White men and boys. She argued that women are not deficient in their moral reasoning—she proposed that males and females reason differently. Girls and women focus more on staying connected and the importance of interpersonal relationships. Therefore, in the Heinz dilemma, many girls and women respond that Heinz should not steal the medicine. Their reasoning is that if he steals the medicine, is arrested, and is put in jail, then he and his wife will be separated, and she could die while he is still in prison.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=597#h5p-157>

Summary

There are many theories regarding how babies and children grow and develop into happy, healthy adults. Sigmund Freud suggested that we pass through a series of psychosexual stages in which our energy is focused on certain erogenous zones on the body. Eric Erikson modified Freud's ideas and suggested a theory of psychosocial development. Erikson said that our social interactions and successful completion of social tasks shape our sense of self. Jean Piaget proposed a theory of cognitive development that explains how children think and reason as they move through various stages. Finally, Lawrence Kohlberg turned his attention to moral development. He said that we pass through three levels of moral thinking that build on our cognitive development.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=597#h5p-158>

Critical Thinking Questions

What is the difference between assimilation and accommodation? Provide examples of each. Assimilation is when we take in information that is comparable to what we already know. Accommodation is when we change our schemata based on new information. An example of assimilation is a child's schema of "dog" based on the family's golden retriever being expanded to include two newly adopted golden retrievers. An example of accommodation is that same child's schema of "dog" being adjusted to exclude other four-legged furry animals such as sheep and foxes.

Why was Carol Gilligan critical of Kohlberg's theory of moral development? Gilligan criticized Kohlberg because his theory was based on the responses of upper class White men and boys, arguing that it was biased against women. While Kohlberg concluded that women must be deficient in their moral reasoning abilities, Gilligan disagreed, suggesting that female moral reasoning is not deficient, just different.

What is egocentrism? Provide an original example. Egocentrism is the inability to take the perspective of another person. This type of thinking is common in young children in the preoperational stage of cognitive development. An example

might be that upon seeing his mother crying, a young child gives her his favorite stuffed animal to make her feel better.

Personal Application Questions

Explain how you would use your understanding of one of the major developmental theories to deal with each of the difficulties listed below:

1. Your infant daughter puts everything in her mouth, including the dog's food.
2. Your 8-year-old son is failing math; all he cares about is baseball.
3. Your 2-year-old daughter refuses to wear the clothes you pick for her every morning, which makes getting dressed a 20-minute battle.
4. Your 68-year-old neighbor is chronically depressed and feels she has wasted her life.
5. Your 18-year-old daughter has decided not to go to college. Instead she's moving to Colorado to become a ski instructor.
6. Your 11-year-old son is the class bully.

29.

STAGES OF HUMAN DEVELOPMENT

Learning Objectives

By the end of this section, you will be able to:

- Describe the stages of prenatal development and recognize the importance of prenatal care
- Discuss physical, cognitive, and emotional development that occurs from infancy through childhood
- Discuss physical, cognitive, and emotional development that occurs during adolescence
- Discuss physical, cognitive, and emotional development that occurs in adulthood

From the moment we are born until the moment we die, we continue to develop.

As discussed at the beginning of this chapter, developmental psychologists often divide our development into three areas: physical development, cognitive development, and psychosocial development. Mirroring Erikson's stages, lifespan development is divided into different stages that are based on age. We will discuss prenatal, infant, child, adolescent, and adult development.

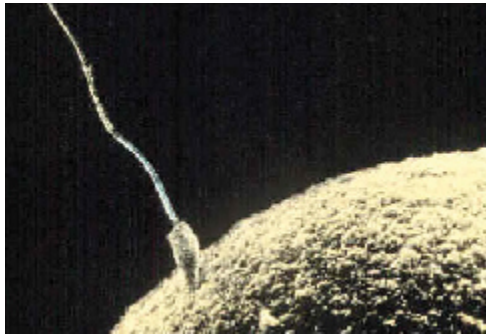
Prenatal Development

How did you come to be who you are? From beginning as a one-cell structure to your birth, your prenatal development occurred in an orderly and delicate sequence.

There are three stages of prenatal development: germinal, embryonic, and fetal. Let's take a look at what happens to the developing baby in each of these stages.

Germinal Stage (Weeks 1–2)

In the discussion of biopsychology earlier in the book, you learned about genetics and DNA. A mother and father’s DNA is passed on to the child at the moment of conception. **Conception** occurs when sperm fertilizes an egg and forms a zygote. A **zygote** begins as a one-cell structure that is created when a sperm and egg merge. The genetic makeup and sex of the baby are set at this point. During the first week after conception, the zygote divides and multiplies, going from a one-cell structure to two cells, then four cells, then eight cells, and so on. This *process of cell division* is called **mitosis**. Mitosis is a fragile process, and fewer than one-half of all zygotes survive beyond the first two weeks (Hall, 2004). After five days of mitosis there are one hundred cells, and after nine months there are billions of cells. As the cells divide, they become more specialized, forming different organs and body parts. In the **germinal stage**, the mass of cells has yet to attach itself to the lining of the mother’s uterus. Once it does, the next stage begins.



Sperm and ovum fuse at the point of conception.

Embryonic Stage (Weeks 3–8)

After the zygote divides for about 7–10 days and has 150 cells, it travels down the fallopian tubes and implants itself in the lining of the uterus. Upon implantation, this multi-cellular organism is called an embryo. Now blood vessels grow, forming the placenta. The **placenta** is a structure connected to the uterus that provides nourishment and oxygen from the mother to the developing embryo via the umbilical cord. Basic structures of the embryo start to develop into areas that will become the head, chest, and abdomen. During the **embryonic stage**, the heart begins to beat and organs form and begin to function. The neural tube forms along the back of the embryo, developing into the spinal cord and brain.

Fetal Stage (Weeks 9–40)

When the organism is about 9 weeks old, the embryo is called a **fetus**. At this stage, the fetus is about the size of a kidney bean and begins to take on the recognizable form of a human being as the “tail” begins to disappear.

From 9–12 weeks, the sex organs begin to differentiate. At about 16 weeks, the fetus is approximately 4.5 inches long. Fingers and toes are fully developed, and fingerprints are visible. By the time the fetus reaches the sixth month of development (24 weeks), it weighs up to 1.4 pounds. Hearing has developed, so the fetus can respond to sounds. The internal organs, such as the lungs, heart, stomach, and intestines, have formed enough that a fetus born prematurely at this point has a chance to survive outside of the mother's womb. Throughout the fetal stage the brain continues to grow and develop, nearly doubling in size from weeks 16 to 28. Around 36 weeks, the fetus is almost ready for birth. It weighs about 6 pounds and is about 18.5 inches long, and by week 37 all of the fetus's organ systems are developed enough that it could survive outside the mother's uterus without many of the risks associated with premature birth. The fetus continues to gain weight and grow in length until approximately 40 weeks. By then, the fetus has very little room to move around and birth becomes imminent.



9 weeks
Fetal stage begins



12 weeks
Sex organs differentiate



16 weeks
Fingers and toes develop



20 weeks
Hearing begins



24 weeks
Lungs begin to develop



28 weeks
Brain grows rapidly



32 weeks
Bones fully develop



36 weeks
Muscles fully develop



40 weeks
Full-term development

During the fetal stage, the baby's brain develops and the body adds size and weight until the fetus reaches full-term development.

For an amazing look at prenatal development and the process of birth, view the video *Life's Greatest Miracle* from Nova and PBS: [Life's Greatest Miracle](#).

Prenatal Influences

During each prenatal stage, genetic and environmental factors can affect development. The developing fetus is completely dependent on the mother for life. It is important that the mother takes good care of herself and receives prenatal care, which is medical care during pregnancy that monitors the health of both the mother and the fetus. According to the National Institutes of Health ([NIH], 2013), routine prenatal care is important because it can reduce the risk of complications for the mother and fetus during pregnancy. In fact, women who are trying to become pregnant or who may become pregnant should discuss pregnancy planning with their doctor. They may be advised, for example, to take a vitamin containing folic acid, which helps prevent certain birth defects, or to monitor aspects of their diet or exercise routines.



A pregnant woman receives an ultrasound as part of her prenatal care.
(credit: United States Agency for International Development)

Recall that when the zygote attaches to the wall of the mother's uterus, the placenta is formed. The placenta provides nourishment and oxygen to the fetus. Most everything the mother ingests, including food, liquid, and even medication, travels through the placenta to the fetus, hence the common phrase "eating for two." Anything the mother is exposed to in the environment affects the fetus; if the mother is exposed to something harmful, the child can show life-long effects.

A **teratogen** is *any environmental agent—biological, chemical, or physical—that causes damage to the developing embryo or fetus*. There are different types of teratogens. Alcohol and most drugs cross the placenta and affect the fetus. Alcohol is not safe to drink in any amount during pregnancy. Alcohol use during pregnancy has been found to be the leading preventable cause of intellectual disabilities in children in the United States (Maier & West, 2001). Excessive maternal drinking while pregnant can cause fetal alcohol spectrum disorders with life-long consequences for the child ranging in severity from minor to major. **Fetal alcohol spectrum disorders (FASD)** are *a collection of birth defects associated with heavy consumption of alcohol during pregnancy. Physically, children with FASD may have a small head size and abnormal facial features. Cognitively, these children may have poor judgment, poor impulse control, higher rates of ADHD,*

learning issues, and lower IQ scores. These developmental problems and delays persist into adulthood (Streissguth et al., 2004). Based on studies conducted on animals, it also has been suggested that a mother’s alcohol consumption during pregnancy may predispose her child to like alcohol (Youngentob et al., 2007).

Fetal Alcohol Syndrome Facial Features

Facial Feature	Potential Effect of Fetal Alcohol Syndrome
Head size	Below-average head circumference
Eyes	Smaller than average eye opening, skin folds at corners of eyes
Nose	Low nasal bridge, short nose
Midface	Smaller than average midface size
Lip and philtrum	Thin upper lip, indistinct philtrum

Smoking is also considered a teratogen because nicotine travels through the placenta to the fetus. When the mother smokes, the developing baby experiences a reduction in blood oxygen levels. According to the Centers for Disease Control and Prevention (2013), smoking while pregnant can result in premature birth, low-birth-weight infants, stillbirth, and sudden infant death syndrome (SIDS).

Heroin, cocaine, methamphetamine, almost all prescription medicines, and most over-the-counter medications are also considered teratogens. Babies born with a heroin addiction need heroin just like an adult addict. The child will need to be gradually weaned from the heroin under medical supervision; otherwise, the child could have seizures and die. Other teratogens include radiation, viruses such as HIV and herpes, and rubella (German measles). Women in the United States are much less likely to be afflicted with rubella because most women receive childhood immunizations or vaccinations that protect the body from disease.

Each organ of the fetus develops during a specific period in the pregnancy, called the critical or sensitive period. For example, research with primate models of FASD has demonstrated that the time during which a developing fetus is exposed to alcohol can dramatically affect the appearance of facial characteristics associated with fetal alcohol syndrome. Specifically, this research suggests that alcohol exposure that is limited to day 19 or 20 of gestation can lead to significant facial abnormalities in the offspring (Ashley, Magnuson, Omnell, & Clarren, 1999). Given regions of the brain also show sensitive periods during which they are most susceptible to the teratogenic effects of alcohol (Tran & Kelly, 2003).

Should Women Who Use Drugs During Pregnancy Be Arrested and Jailed?

As you now know, women who use drugs or alcohol during pregnancy can cause serious lifelong harm to their children. Some people have advocated mandatory screenings for women who are pregnant and have a history of drug abuse, and if the women continue using, to arrest, prosecute, and incarcerate them (Figdor & Kaeser,

1998). This policy was tried in Charleston, South Carolina, as recently as 20 years ago. The policy was called the Interagency Policy on Management of Substance Abuse During Pregnancy and had disastrous results.

The Interagency Policy applied to patients attending the obstetrics clinic at MUSC, which primarily serves patients who are indigent or on Medicaid. It did not apply to private obstetrical patients. The policy required patient education about the harmful effects of substance abuse during pregnancy. . . . [A] statement also warned patients that protection of unborn and newborn children from the harms of illegal drug abuse could involve the Charleston police, the Solicitor of the Ninth Judicial Court, and the Protective Services Division of the Department of Social Services (DSS). (Jos, Marshall, & Perlmutter, 1995, pp. 120–121)

This policy seemed to deter women from seeking prenatal care, deterred them from seeking other social services, and was applied solely to low-income women, resulting in lawsuits. The program was canceled after 5 years, during which 42 women were arrested. A federal agency later determined that the program involved human experimentation without the approval and oversight of an institutional review board (IRB). What were the flaws in the program and how would you correct them? What are the ethical implications of charging pregnant women with child abuse?

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=599#h5p-160>

Infancy through Childhood

The average newborn weighs approximately 7.5 pounds. Although small, a newborn is not completely helpless because his reflexes and sensory capacities help him interact with the environment from the moment of birth. All healthy babies are born with newborn reflexes: inborn automatic responses to particular forms of stimulation. Reflexes help the newborn survive until it is capable of more complex behaviors—these reflexes are crucial to survival. They are present in babies whose brains are developing normally and usually disappear around 4–5 months old. Let’s take a look at some of these newborn reflexes. The rooting reflex is the newborn’s

response to anything that touches her cheek: When you stroke a baby's cheek, she naturally turns her head in that direction and begins to suck. The sucking reflex is the automatic, unlearned sucking motions that infants do with their mouths. Several other interesting newborn reflexes can be observed. For instance, if you put your finger into a newborn's hand, you will witness the grasping reflex, in which a baby automatically grasps anything that touches his palms. The Moro reflex is the newborn's response when she feels like she is falling. The baby spreads her arms, pulls them back in, and then (usually) cries. How do you think these reflexes promote survival in the first months of life?

Take a few minutes to view this brief video clip illustrating several newborn reflexes: [Reflexes in newborn babies](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-1>

What can young infants see, hear, and smell? Newborn infants' sensory abilities are significant, but their senses are not yet fully developed. Many of a newborn's innate preferences facilitate interaction with caregivers and other humans. Although vision is their least developed sense, newborns already show a preference for faces. Babies who are just a few days old also prefer human voices, they will listen to voices longer than sounds that do not involve speech (Vouloumanos & Werker, 2004), and they seem to prefer their mother's voice over a stranger's voice (Mills & Melhuish, 1974). In an interesting experiment, 3-week-old babies were given pacifiers that played a recording of the infant's mother's voice and of a stranger's voice. When the infants heard their mother's voice, they sucked more strongly at the pacifier (Mills & Melhuish, 1974). Newborns also have a strong sense of smell. For instance, newborn babies can distinguish the smell of their own mother from that of others. In a study by MacFarlane (1978), 1-week-old babies who were being breastfed were placed between two gauze pads. One gauze pad was from the bra of a nursing mother who was a stranger, and the other gauze pad was from the bra of the infant's own mother. More than two-thirds of the week-old babies turned toward the gauze pad with their mother's scent.

Physical Development

In infancy, toddlerhood, and early childhood, the body's physical development is rapid. On average, newborns

weigh between 5 and 10 pounds, and a newborn's weight typically doubles in 6 months and triples in 1 year. By 2 years old the weight will have quadrupled, so we can expect that a 2-year-old should weigh between 20 and 40 pounds. The average length of a newborn is 19.5 inches, increasing to 29.5 inches by 12 months and 34.4 inches by 2 years old (WHO Multicentre Growth Reference Study Group, 2006).



Children experience rapid physical changes through infancy and early childhood. (credit “left”: modification of work by Kerry Ceszyk; credit “middle-left”: modification of work by Kristi Fausel; credit “middle-right”: modification of work by “devinf”/Flickr; credit “right”: modification of work by Rose Spielman)

During infancy and childhood, growth does not occur at a steady rate (Carel, Lahlou, Roger, & Chaussain, 2004). Growth slows between 4 and 6 years old: During this time children gain 5–7 pounds and grow about 2–3 inches per year. Once girls reach 8–9 years old, their growth rate outpaces that of boys due to a pubertal growth spurt. This growth spurt continues until around 12 years old, coinciding with the start of the menstrual cycle. By 10 years old, the average girl weighs 88 pounds, and the average boy weighs 85 pounds.

We are born with all of the brain cells that we will ever have—about 100–200 billion neurons (nerve cells) whose function is to store and transmit information (Huttenlocher & Dabholkar, 1997). However, the nervous system continues to grow and develop. Each neural pathway forms thousands of new connections during infancy and toddlerhood. This *period of rapid neural growth* is called **blooming**. Neural pathways continue to develop through puberty. The blooming period of neural growth is then followed by a period of pruning, where neural connections are reduced. It is thought that pruning causes the brain to function more efficiently, allowing for mastery of more complex skills (Hutchinson, 2011). Blooming occurs during the first few years of life, and pruning continues through childhood and into adolescence in various areas of the brain.

The size of our brains increases rapidly. For example, the brain of a 2-year-old is 55% of its adult size, and by 6 years old the brain is about 90% of its adult size (Tanner, 1978). During early childhood (ages 3–6), the frontal lobes grow rapidly. Recalling our discussion of the 4 lobes of the brain earlier in this book, the frontal lobes are associated with planning, reasoning, memory, and impulse control. Therefore, by the time children reach school age, they are developmentally capable of controlling their attention and behavior. Through the elementary school years, the frontal, temporal, occipital, and parietal lobes all grow in size. The brain growth spurts experienced in childhood tend to follow Piaget’s sequence of cognitive development so that significant changes in neural functioning account for cognitive advances (Kolb & Whishaw, 2009; Overman, Bachevalier, Turner, & Peuster, 1992).

Motor development occurs in an orderly sequence as infants move from reflexive reactions (e.g., sucking and rooting) to more advanced motor functioning. For instance, babies first learn to hold their heads up, then to sit with assistance, and then to sit unassisted, followed later by crawling and then walking.

Motor skills refer to our ability to move our bodies and manipulate objects. **Fine motor skills** focus on the muscles in our fingers, toes, and eyes, and enable coordination of small actions (e.g., grasping a toy, writing with a pencil, and using a spoon). **Gross motor skills** focus on large muscle groups that control our arms and legs and involve larger movements (e.g., balancing, running, and jumping).

As motor skills develop, there are certain developmental milestones that young children should achieve. For each milestone there is an average age, as well as a range of ages in which the milestone should be reached. An example of a developmental milestone is sitting. On average, most babies sit alone at 7 months old. Sitting involves both coordination and muscle strength, and 90% of babies achieve this milestone between 5 and 9 months old. In another example, babies on average are able to hold up their head at 6 weeks old, and 90% of babies achieve this between 3 weeks and 4 months old. If a baby is not holding up his head by 4 months old, he is showing a delay. If the child is displaying delays on several milestones, that is reason for concern, and the parent or caregiver should discuss this with the child’s pediatrician. Some developmental delays can be identified and addressed through early intervention.

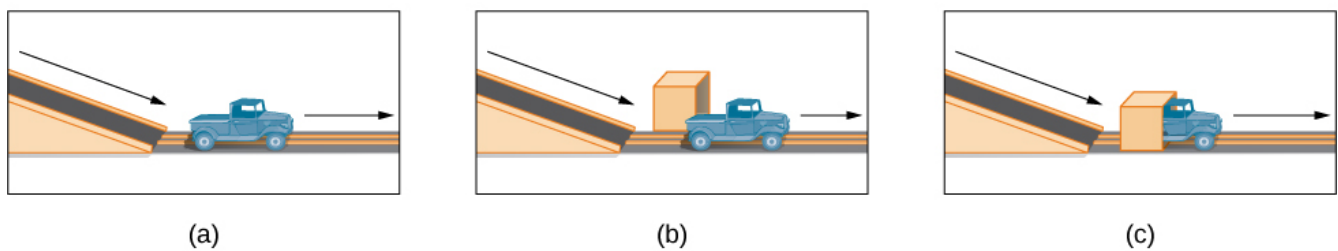
Developmental Milestones, Ages 2–5 Years

Age (years)	Physical	Personal/Social	Language	Cognitive
2	Kicks a ball; walks up and down stairs	Plays alongside other children; copies adults	Points to objects when named; puts 2–4 words together in a sentence	Sorts shapes and colors; follows 2-step instructions
3	Climbs and runs; pedals tricycle	Takes turns; expresses many emotions; dresses self	Names familiar things; uses pronouns	Plays make believe; works toys with parts (levers, handles)
4	Catches balls; uses scissors	Prefers social play to solo play; knows likes and interests	Knows songs and rhymes by memory	Names colors and numbers; begins writing letters
5	Hops and swings; uses fork and spoon	Distinguishes real from pretend; likes to please friends	Speaks clearly; uses full sentences	Counts to 10 or higher; prints some letters and copies basic shapes

Cognitive Development

In addition to rapid physical growth, young children also exhibit significant development of their cognitive abilities. Piaget thought that children’s ability to understand objects—such as learning that a rattle makes a noise when shaken—was a cognitive skill that develops slowly as a child matures and interacts with the environment. Today, developmental psychologists think Piaget was incorrect. Researchers have found that

even very young children understand objects and how they work long before they have experience with those objects (Baillargeon, 1987; Baillargeon, Li, Gertner, & Wu, 2011). For example, children as young as 3 months old demonstrated knowledge of the properties of objects that they had only viewed and did not have prior experience with them. In one study, 3-month-old infants were shown a truck rolling down a track and behind a screen. The box, which appeared solid but was actually hollow, was placed next to the track. The truck rolled past the box as would be expected. Then the box was placed on the track to block the path of the truck. When the truck was rolled down the track this time, it continued unimpeded. The infants spent significantly more time looking at this impossible event. Baillargeon (1987) concluded that they knew solid objects could not pass through each other. Baillargeon's findings suggest that very young children have an understanding of objects and how they work, which Piaget (1954) would have said is beyond their cognitive abilities due to their limited experiences in the world.



In Baillargeon's study, infants observed a truck (a) roll down an unobstructed track, (b) roll down an unobstructed track with an obstruction (box) beside it, and (c) roll down and pass through what appeared to be an obstruction.

Just as there are physical milestones that we expect children to reach, there are also cognitive milestones. It is helpful to be aware of these milestones as children gain new abilities to think, problem-solve, and communicate. For example, infants shake their head “no” around 6–9 months, and they respond to verbal requests to do things like “wave bye-bye” or “blow a kiss” around 9–12 months. Remember Piaget's ideas about object permanence? We can expect children to grasp the concept that objects continue to exist even when they are not in sight by around 8 months old. Because toddlers (i.e., 12–24 months old) have mastered object permanence, they enjoy games like hide and seek, and they realize that when someone leaves the room they will come back (Loop, 2013). Toddlers also point to pictures in books and look in appropriate places when you ask them to find objects.

Preschool-age children (i.e., 3–5 years old) also make steady progress in cognitive development. Not only can they count, name colors, and tell you their name and age, but they can also make some decisions on their own, such as choosing an outfit to wear. Preschool-age children understand basic time concepts and sequencing (e.g., before and after), and they can predict what will happen next in a story. They also begin to enjoy the use of humor in stories. Because they can think symbolically, they enjoy pretend play and inventing elaborate characters and scenarios. One of the most common examples of their cognitive growth is their blossoming curiosity. Preschool-age children love to ask “Why?”

An important cognitive change occurs in children this age. Recall that Piaget described 2-to-3-year-olds as egocentric, meaning that they do not have an awareness of others' points of view. Between 3 and 5 years old, children come to understand that people have thoughts, feelings, and beliefs that are different from their own. This is known as theory-of-mind (TOM). Children can use this skill to tease others, persuade their parents to purchase a candy bar, or understand why a sibling might be angry. When children develop TOM, they can recognize that others have false beliefs (Dennett, 1987; Callaghan et al., 2005).

False-belief tasks are useful in determining a child's acquisition of theory-of-mind (TOM). Take a look at this video clip showing a false-belief task involving a box of crayons: [The "False Belief" Test: Theory of Mind](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-2>

Cognitive skills continue to expand in middle and late childhood (6–11 years old). Thought processes become more logical and organized when dealing with concrete information. Children at this age understand concepts such as the past, present, and future, giving them the ability to plan and work toward goals. Additionally, they can process complex ideas such as addition and subtraction and cause-and-effect relationships. However, children's attention spans tend to be very limited until they are around 11 years old. After that point, it begins to improve through adulthood.



Because they understand luck and fairness, children in middle and late childhood (6–11 years old) are able to follow rules for games. (credit: Edwin Martinez)

One well-researched aspect of cognitive development is language acquisition. As mentioned earlier, the order in which children learn language structures is consistent across children and cultures (Hatch, 1983). You’ve also learned that some psychological researchers have proposed that children possess a biological predisposition for language acquisition.

Starting before birth, babies begin to develop language and communication skills. At birth, babies apparently recognize their mother’s voice and can discriminate between the language(s) spoken by their mothers and foreign languages, and they show preferences for faces that are moving in synchrony with audible language (Blossom & Morgan, 2006; Pickens, 1994; Spelke & Cortelou, 1981).

Children communicate information through gesturing long before they speak, and there is some evidence that gesture usage predicts subsequent language development (Iverson & Goldin-Meadow, 2005). In terms of producing spoken language, babies begin to coo almost immediately. Cooing is a one-syllable combination of a consonant and a vowel sound (e.g., coo or ba). Interestingly, babies replicate sounds from their own languages. A baby whose parents speak French will coo in a different tone than a baby whose parents speak Spanish or Urdu. After cooing, the baby starts to babble. Babbling begins with repeating a syllable, such as ma-ma, da-da, or ba-ba. When a baby is about 12 months old, we expect her to say her first word for meaning and to start combining words for meaning at about 18 months.

At about 2 years old, a toddler uses between 50 and 200 words; by 3 years old they have a vocabulary of up to 1,000 words and can speak in sentences. During the early childhood years, children’s vocabulary increases at a rapid pace. This is sometimes referred to as the “vocabulary spurt” and has been claimed to involve an expansion in vocabulary at a rate of 10–20 new words per week. Recent research may indicate that while some children experience these spurts, it is far from universal (as discussed in Ganger & Brent, 2004). It has been estimated that 5-year-olds understand about 6,000 words, speak 2,000 words, and can define words and question their meanings. They can rhyme and name the days of the week. Seven-year-olds speak fluently and use slang and clichés (Stork & Widdowson, 1974).

What accounts for such dramatic language learning by children? Behaviorist B. F. Skinner thought that we learn language in response to reinforcement or feedback, such as through parental approval or through being understood. For example, when a 2-year-old child asks for juice, he might say, “Me juice,” to which his mother might respond by giving him a cup of apple juice. Noam Chomsky (1957) criticized Skinner’s theory and proposed that we are all born with an innate capacity to learn language. Chomsky called this mechanism a language acquisition device (LAD). Who is correct? Both Chomsky and Skinner are right. Remember that we are a product of both nature and nurture. Researchers now believe that language acquisition is partially inborn and partially learned through our interactions with our linguistic environment (Gleitman & Newport, 1995; Stork & Widdowson, 1974).

Attachment

Psychosocial development *occurs as children form relationships, interact with others, and understand and manage their feelings.* In social and emotional development, forming healthy attachments is very important and is the major social milestone of infancy. Attachment is a long-standing connection or bond with others. Developmental psychologists are interested in how infants reach this milestone. They ask such questions as: How do parent and infant attachment bonds form? How does neglect affect these bonds? What accounts for children’s attachment differences?

Researchers Harry Harlow, John Bowlby, and Mary Ainsworth conducted studies designed to answer these questions. In the 1950s, Harlow conducted a series of experiments on monkeys. He separated newborn monkeys from their mothers. Each monkey was presented with two surrogate mothers. One surrogate monkey was made out of wire mesh, and she could dispense milk. The other monkey was softer and made from cloth: This monkey did not dispense milk. Research shows that the monkeys preferred the soft, cuddly cloth monkey, even though she did not provide any nourishment. The baby monkeys spent their time clinging to the cloth monkey and only went to the wire monkey when they needed to be fed. Prior to this study, the medical and scientific communities generally thought that babies become attached to the people who provide their nourishment. However, Harlow (1958) concluded that there was more to the mother-child bond than nourishment. Feelings of comfort and security are the critical components of maternal-infant bonding, which leads to healthy psychosocial development.

Harlow’s studies of monkeys were performed before modern ethics guidelines were in place, and today his experiments are widely considered to be unethical and even cruel. Watch this

video to see actual footage of Harlow's monkey studies: [Harlow's Studies on Dependency in Monkeys](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-3>

Building on the work of Harlow and others, John Bowlby developed the concept of attachment theory. He defined **attachment** as *the affectional bond or tie that an infant forms with the mother* (Bowlby, 1969). An infant must form this bond with a primary caregiver in order to have normal social and emotional development. In addition, Bowlby proposed that this attachment bond is very powerful and continues throughout life. He used the concept of secure base to define a healthy attachment between parent and child (1988). A secure base is a parental presence that gives the child a sense of safety as he explores his surroundings. Bowlby said that two things are needed for a healthy attachment: The caregiver must be responsive to the child's physical, social, and emotional needs; and the caregiver and child must engage in mutually enjoyable interactions (Bowlby, 1969).



Mutually enjoyable interactions promote the mother-infant bond. (credit: Peter Shanks)

While Bowlby thought attachment was an all-or-nothing process, Mary Ainsworth's (1970) research showed otherwise. Ainsworth wanted to know if children differ in the ways they bond, and if so, why. To find the

answers, she used the Strange Situation procedure to study attachment between mothers and their infants (1970). In the Strange Situation, the mother (or primary caregiver) and the infant (age 12-18 months) are placed in a room together. There are toys in the room, and the caregiver and child spend some time alone in the room. After the child has had time to explore her surroundings, a stranger enters the room. The mother then leaves her baby with the stranger. After a few minutes, she returns to comfort her child.

Based on how the infants/toddlers responded to the separation and reunion, Ainsworth identified three types of **parent-child attachments**: *secure, avoidant, and resistant* (Ainsworth & Bell, 1970). A fourth style, known as disorganized attachment, was later described (Main & Solomon, 1990). The most common type of attachment—also considered the healthiest—is called **secure attachment**. In this type of attachment, *the toddler prefers his parent over a stranger*. The attachment figure is used as a secure base to explore the environment and is sought out in times of stress. Securely attached children were distressed when their caregivers left the room in the Strange Situation experiment, but when their caregivers returned, the securely attached children were happy to see them. Securely attached children have caregivers who are sensitive and responsive to their needs.



In secure attachment, the parent provides a secure base for the toddler, allowing him to securely explore his environment. (credit: Kerry Ceszyk)

With **avoidant attachment**, *the child is unresponsive to the parent, does not use the parent as a secure base, and does not care if the parent leaves*. The toddler reacts to the parent the same way she reacts to a stranger. When the parent does return, the child is slow to show a positive reaction. Ainsworth theorized that these children were

most likely to have a caregiver who was insensitive and inattentive to their needs (Ainsworth, Blehar, Waters, & Wall, 1978).

In cases of **resistant attachment**, *children tend to show clingy behavior, but then they reject the attachment figure's attempts to interact with them* (Ainsworth & Bell, 1970). These children do not explore the toys in the room, as they are too fearful. During separation in the Strange Situation, they became extremely disturbed and angry with the parent. When the parent returns, the children are difficult to comfort. Resistant attachment is the result of the caregivers' inconsistent level of response to their child.

Finally, children with **disorganized attachment** *behaved oddly* in the Strange Situation. They freeze, run around the room in an erratic manner, or try to run away when the caregiver returns (Main & Solomon, 1990). This type of attachment is seen most often in kids who have been abused. Research has shown that abuse disrupts a child's ability to regulate their emotions.

While Ainsworth's research has found support in subsequent studies, it has also met criticism. Some researchers have pointed out that a child's temperament may have a strong influence on attachment (Gervai, 2009; Harris, 2009), and others have noted that attachment varies from culture to culture, a factor not accounted for in Ainsworth's research (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000; van Ijzendoorn & Sagi-Schwartz, 2008).

Watch this video to view a clip of the Strange Situation. Try to identify which type of attachment baby Lisa exhibits: [The Strange Situation – Mary Ainsworth](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-4>

Self-Concept

Just as attachment is the main psychosocial milestone of infancy, the primary psychosocial milestone of childhood is the development of a positive sense of self. How does self-awareness develop? Infants don't have a self-concept, which is an understanding of who they are. If you place a baby in front of a mirror, she will reach out to touch her image, thinking it is another baby. However, by about 18 months a toddler will recognize that the person in the mirror is herself. How do we know this? In a well-known experiment, a researcher placed a red dot of paint on children's noses before putting them in front of a mirror (Amsterdam, 1972). Commonly

known as the mirror test, this behavior is demonstrated by humans and a few other species and is considered evidence of self-recognition (Archer, 1992). At 18 months old they would touch their own noses when they saw the paint, surprised to see a spot on their faces. By 24–36 months old children can name and/or point to themselves in pictures, clearly indicating self-recognition.

Children from 2–4 years old display a great increase in social behavior once they have established a self-concept. They enjoy playing with other children, but they have difficulty sharing their possessions. Also, through play children explore and come to understand their gender roles and can label themselves as a girl or boy (Chick, Heilman-Houser, & Hunter, 2002). By 4 years old, children can cooperate with other children, share when asked, and separate from parents with little anxiety. Children at this age also exhibit **autonomy**, *initiate tasks, and carry out plans*. Success in these areas *contributes to a positive sense of self*. Once children reach 6 years old, they can identify themselves in terms of group memberships: “I’m a first grader!” School-age children compare themselves to their peers and discover that they are competent in some areas and less so in others (recall Erikson’s task of industry versus inferiority). At this age, children recognize their own personality traits as well as some other traits they would like to have. For example, 10-year-old Layla says, “I’m kind of shy. I wish I could be more talkative like my friend Alexa.”

Development of a positive self-concept is important to healthy development. Children with a positive self-concept tend to be more confident, do better in school, act more independently, and are more willing to try new activities (Maccoby, 1980; Ferrer & Fugate, 2003). Formation of a positive self-concept begins in Erikson’s toddlerhood stage, when children establish autonomy and become confident in their abilities. Development of self-concept continues in elementary school, when children compare themselves to others. When the comparison is favorable, children feel a sense of competence and are motivated to work harder and accomplish more. Self-concept is re-evaluated in Erikson’s adolescence stage, as teens form an identity. They internalize the messages they have received regarding their strengths and weaknesses, keeping some messages and rejecting others. Adolescents who have achieved identity formation are capable of contributing positively to society (Erikson, 1968).

What can parents do to nurture a healthy self-concept? Diana Baumrind (1971, 1991) thinks parenting style may be a factor. The way we parent is an important factor in a child’s socioemotional growth. Baumrind developed and refined a theory describing **four parenting styles**: *authoritative, authoritarian, permissive, and uninvolved*. With the **authoritative style**, *the parent gives reasonable demands and consistent limits, expresses warmth and affection, and listens to the child’s point of view*. Parents set rules and explain the reasons behind them. They are also flexible and willing to make exceptions to the rules in certain cases—for example, temporarily relaxing bedtime rules to allow for a nighttime swim during a family vacation. Of the four parenting styles, the authoritative style is the one that is most encouraged in modern American society. American children raised by authoritative parents tend to have high self-esteem and social skills. However, effective parenting styles vary as a function of culture and, as Small (1999) points out, the authoritative style is not necessarily preferred or appropriate in all cultures.

In **authoritarian style**, *the parent places high value on conformity and obedience. The parents are often strict,*

tightly monitor their children, and express little warmth. In contrast to the authoritative style, authoritarian parents probably would not relax bedtime rules during a vacation because they consider the rules to be set, and they expect obedience. This style can create anxious, withdrawn, and unhappy kids. However, it is important to point out that authoritarian parenting is as beneficial as the authoritative style in some ethnic groups (Russell, Crockett, & Chao, 2010). For instance, first-generation Chinese American children raised by authoritarian parents did just as well in school as their peers who were raised by authoritative parents (Russell et al., 2010).

For parents who employ the **permissive style of parenting**, *the kids run the show and anything goes. Permissive parents make few demands and rarely use punishment.* They tend to be very nurturing and loving and may play the role of friend rather than parent. In terms of our example of vacation bedtimes, permissive parents might not have bedtime rules at all—instead they allow the child to choose his bedtime whether on vacation or not. Not surprisingly, children raised by permissive parents tend to lack self-discipline, and the permissive parenting style is negatively associated with grades (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987). The permissive style may also contribute to other risky behaviors such as alcohol abuse (Bahr & Hoffman, 2010), risky sexual behavior especially among female children (Donenberg, Wilson, Emerson, & Bryant, 2002), and increased display of disruptive behaviors by male children (Parent et al., 2011). However, there are some positive outcomes associated with children raised by permissive parents. They tend to have higher self-esteem, better social skills, and report lower levels of depression (Darling, 1999).

With the **uninvolved style of parenting**, *the parents are indifferent, uninvolved, and sometimes referred to as neglectful. They don't respond to the child's needs and make relatively few demands.* This could be because of severe depression or substance abuse, or other factors such as the parents' extreme focus on work. These parents may provide for the child's basic needs, but little else. The children raised in this parenting style are usually emotionally withdrawn, fearful, anxious, perform poorly in school, and are at an increased risk of substance abuse (Darling, 1999).

As you can see, parenting styles influence childhood adjustment, but could a child's temperament likewise influence parenting? **Temperament** refers to innate traits that influence how one thinks, behaves, and reacts with their environment. Children with easy temperaments demonstrate positive emotions, adapt well to change, and are capable of regulating their emotions. Conversely, children with difficult temperaments demonstrate negative emotions and have difficulty adapting to change and regulating their emotions. Difficult children are much more likely to challenge parents, teachers, and other caregivers (Thomas, 1984). Therefore, it's possible that easy children (i.e., social, adaptable, and easy to soothe) tend to elicit warm and responsive parenting, while demanding, irritable, withdrawn children evoke irritation in their parents or cause their parents to withdraw (Sanson & Rothbart, 1995).

The Importance of Play and Recess

According to the American Academy of Pediatrics (2007), unstructured play is an integral part of a child's development. It builds creativity, problem-solving skills, and social relationships. Play also allows children to develop a theory-of-mind as they imaginatively take on the perspective of others.

Outdoor play allows children the opportunity to directly experience and sense the world around them. While doing so, they may collect objects that they come across and develop lifelong interests and hobbies. They also benefit from increased exercise, and engaging in outdoor play can actually increase how much they enjoy physical activity. This helps support the development of a healthy heart and brain. Unfortunately, research suggests that today's children are engaging in less and less outdoor play (Clements, 2004). Perhaps, it is no surprise to learn that lowered levels of physical activity in conjunction with easy access to calorie-dense foods with little nutritional value are contributing to alarming levels of childhood obesity (Karnik & Kanekar, 2012).

Despite the adverse consequences associated with reduced play, some children are over-scheduled and have little free time to engage in unstructured play. In addition, some schools have taken away recess time for children in a push for students to do better on standardized tests, and many schools commonly use loss of recess as a form of punishment. Do you agree with these practices? Why or why not?

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=599#h5p-161>

Adolescence

Adolescence is a socially constructed concept. In pre-industrial society, children were considered adults when they reached physical maturity, but today we have an extended time between childhood and adulthood called adolescence. **Adolescence** is *the period of development that begins at puberty and ends at emerging adulthood*, which is discussed later. In the United States, adolescence is seen as a time to develop independence from

parents while remaining connected to them. The typical age range of adolescence is from 12 to 18 years, and this stage of development also has some predictable physical, cognitive, and psychosocial milestones.



Peers are a primary influence on our development in adolescence. (credit: Sheila Tostes)

Physical Development

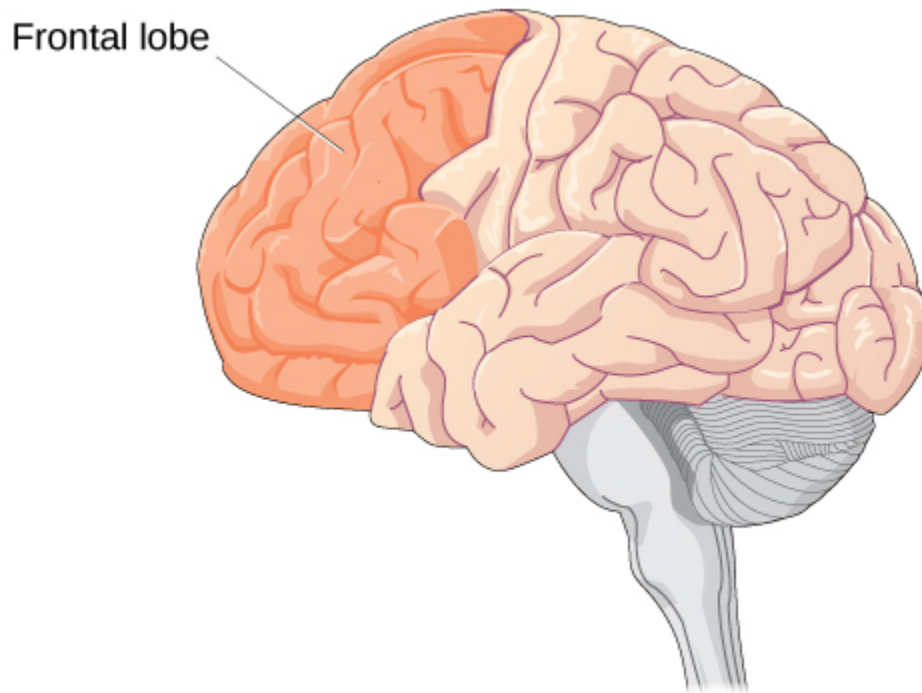
As noted above, adolescence begins with puberty. While the sequence of physical changes in puberty is predictable, the onset and pace of puberty vary widely. Several physical changes occur during puberty, such as **adrenarche and gonadarche**, *the maturing of the adrenal glands and sex glands, respectively*. Also during this time, primary and secondary sexual characteristics develop and mature. **Primary sexual characteristics** are *organs specifically needed for reproduction, like the uterus and ovaries in females and testes in males*. **Secondary sexual characteristics** are *physical signs of sexual maturation that do not directly involve sex organs, such as development of breasts and hips in girls, and development of facial hair and a deepened voice in boys*. Girls experience **menarche**, *the beginning of menstrual periods, usually around 12–13 years old*, and boys experience **spermarche**, *the first ejaculation, around 13–14 years old*.

During puberty, both sexes experience a rapid increase in height (i.e., growth spurt). For girls this begins between 8 and 13 years old, with adult height reached between 10 and 16 years old. Boys begin their growth spurt slightly later, usually between 10 and 16 years old, and reach their adult height between 13 and 17 years old. Both nature (i.e., genes) and nurture (e.g., nutrition, medications, and medical conditions) can influence height.

Because rates of physical development vary so widely among teenagers, puberty can be a source of pride or embarrassment. Early maturing boys tend to be stronger, taller, and more athletic than their later maturing peers. They are usually more popular, confident, and independent, but they are also at a greater risk for substance abuse and early sexual activity (Flannery, Rowe, & Gulley, 1993; Kaltiala-Heino, Rimpela, Rissanen, & Rantanen, 2001). Early maturing girls may be teased or overtly admired, which can cause them to feel self-conscious about their developing bodies. These girls are at a higher risk for depression, substance abuse,

and eating disorders (Ge, Conger, & Elder, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Striegel-Moore & Cachelin, 1999). Late-blooming boys and girls (i.e., they develop more slowly than their peers) may feel self-conscious about their lack of physical development. Negative feelings are particularly a problem for late-maturing boys, who are at a higher risk for depression and conflict with parents (Graber et al., 1997) and are more likely to be bullied (Pollack & Shuster, 2000).

The adolescent brain also remains under development. Up until puberty, brain cells continue to bloom in the frontal region. Adolescents engage in increased risk-taking behaviors and emotional outbursts possibly because the frontal lobes of their brains are still developing. Recall that this area is responsible for judgment, impulse control, and planning, and it is still maturing into early adulthood (Casey, Tottenham, Liston, & Durston, 2005).



Brain growth continues into the early 20s. The development of the frontal lobe, in particular, is important during this stage.

According to neuroscientist Jay Giedd in the Frontline video “Inside the Teenage Brain” (2013), “It’s sort of unfair to expect [teens] to have adult levels of organizational skills or decision-making before their brains are finished being built.” Watch this segment on “The Wiring of the Adolescent Brain” to find out more about the developing brain during adolescence: [The Teenage Brain](#).

Cognitive Development

More complex thinking abilities emerge during adolescence. Some researchers suggest this is due to increases in processing speed and efficiency rather than as the result of an increase in mental capacity—in other words, due to improvements in existing skills rather than the development of new ones (Bjorkland, 1987; Case, 1985). During adolescence, teenagers move beyond concrete thinking and become capable of abstract thought. Recall that Piaget refers to this stage as formal operational thought. Teen thinking is also characterized by the ability to consider multiple points of view, imagine hypothetical situations, debate ideas and opinions (e.g., politics, religion, and justice), and form new ideas. In addition, it's not uncommon for adolescents to question authority or challenge established societal norms.

Cognitive empathy, also known as *theory-of-mind* (which we discussed earlier with regard to egocentrism), *relates to the ability to take the perspective of others and feel concern for others* (Shamay-Tsoory, Tomer, & Aharon-Peretz, 2005). Cognitive empathy begins to increase in adolescence and is an important component of social problem-solving and conflict avoidance. According to one longitudinal study, levels of cognitive empathy begin rising in girls around 13 years old and around 15 years old in boys (Van der Graaff et al., 2013). Teens who reported having supportive fathers with whom they could discuss their worries were found to be better able to take the perspective of others (Miklikowska, Duriez, & Soenens, 2011).



Teenage thinking is characterized by the ability to reason logically and solve hypothetical problems such as how to design, plan, and build a structure. (credit: U.S. Army RDECOM)

Psychosocial Development

Adolescents continue to refine their sense of self as they relate to others. Erikson referred to the task of the adolescent as one of identity versus role confusion. Thus, in Erikson's view, an adolescent's main questions are "Who am I?" and "Who do I want to be?" Some adolescents adopt the values and roles that their parents expect

from them. Other teens develop identities that are in opposition to their parents but align with a peer group. This is common as peer relationships become a central focus in adolescents' lives.

As adolescents work to form their identities, they pull away from their parents, and the peer group becomes very important (Shanahan, McHale, Osgood, & Crouter, 2007). Despite spending less time with their parents, most teens report positive feelings toward them (Moore, Guzman, Hair, Lippman, & Garrett, 2004). Warm and healthy parent-child relationships have been associated with positive child outcomes, such as better grades and fewer school behavior problems, in the United States as well as in other countries (Hair et al., 2005).

It appears that most teens don't experience adolescent storm and stress to the degree once famously suggested by **G. Stanley Hall**, *a pioneer in the study of adolescent development*. Only a small number of teens have major conflicts with their parents (Steinberg & Morris, 2001), and most disagreements are minor. For example, in a study of over 1,800 parents of adolescents from various cultural and ethnic groups, Barber (1994) found that conflicts occurred over day-to-day issues such as homework, money, curfews, clothing, chores, and friends. These types of arguments tend to decrease as teens develop (Galambos & Almeida, 1992).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=599#h5p-162>

Emerging Adulthood

The next stage of development is **emerging adulthood**. This is a *relatively newly defined period of lifespan development spanning from 18 years old to the mid-20s, characterized as an in-between time where identity exploration is focused on work and love*.

When does a person become an adult? There are many ways to answer this question. In the United States, you are legally considered an adult at 18 years old. But other definitions of adulthood vary widely; in sociology, for example, a person may be considered an adult when she becomes self-supporting, chooses a career, gets married, or starts a family. The ages at which we achieve these milestones vary from person to person as well as

from culture to culture. For example, in the African country of Malawi, 15-year-old Njemile was married at 14 years old and had her first child at 15 years old. In her culture she is considered an adult. Children in Malawi take on adult responsibilities such as marriage and work (e.g., carrying water, tending babies, and working fields) as early as 10 years old. In stark contrast, independence in Western cultures is taking longer and longer, effectively delaying the onset of adult life.

Why is it taking twentysomethings so long to grow up? It seems that emerging adulthood is a product of both Western culture and our current times (Arnett, 2000). People in developed countries are living longer, allowing the freedom to take an extra decade to start a career and family. Changes in the workforce also play a role. For example, 50 years ago, a young adult with a high school diploma could immediately enter the workforce and climb the corporate ladder. That is no longer the case. Bachelor's and even graduate degrees are required more and more often—even for entry-level jobs (Arnett, 2000). In addition, many students are taking longer (5 or 6 years) to complete a college degree as a result of working and going to school at the same time. After graduation, many young adults return to the family home because they have difficulty finding a job. Changing cultural expectations may be the most important reason for the delay in entering adult roles. Young people are spending more time exploring their options, so they are delaying marriage and work as they change majors and jobs multiple times, putting them on a much later timetable than their parents (Arnett, 2000).

Adulthood

Adulthood *begins around 20 years old and has three distinct stages: early, middle, and late.* Each stage brings its own set of rewards and challenges.

Physical Development

By the time we reach early adulthood (20 to early 40s), our physical maturation is complete, although our height and weight may increase slightly. In young adulthood, our physical abilities are at their peak, including muscle strength, reaction time, sensory abilities, and cardiac functioning. Most professional athletes are at the top of their game during this stage. Many women have children in the young adulthood years, so they may see additional weight gain and breast changes.

Middle adulthood *extends from the 40s to the 60s.* Physical decline is gradual. The skin loses some elasticity, and wrinkles are among the first signs of aging. Visual acuity decreases during this time. Women experience a gradual decline in fertility as they approach the onset of **menopause**, *the end of the menstrual cycle, around 50 years old.* Both men and women tend to gain weight: in the abdominal area for men and in the hips and thighs for women. Hair begins to thin and turn gray.



Physical declines of middle and late adulthood can be minimized with proper exercise, nutrition, and an active lifestyle. (credit: modification of work by Peter Stevens)

Late adulthood is considered to extend from the 60s on. This is the last stage of physical change. The skin continues to lose elasticity, reaction time slows further, and muscle strength diminishes. Smell, taste, hearing, and vision, so sharp in our 20s, decline significantly. The brain may also no longer function at optimal levels, leading to problems like memory loss, dementia, and Alzheimer's disease in later years.

Aging doesn't mean a person can't explore new pursuits, learn new skills, and continue to grow. Watch this inspiring story about Neal Unger, who is a newbie to the world of skateboarding at 60 years old: [NEAL UNGER – 60 YEAR OLD SKATEBOARDER](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-5>

Cognitive Development

Because we spend so many years in adulthood (more than any other stage), cognitive changes are numerous. In

fact, research suggests that adult cognitive development is a complex, ever-changing process that may be even more active than cognitive development in infancy and early childhood (Fischer, Yan, & Stewart, 2003).

There is good news for the middle age brain. View this brief video to find out what it is: [Middle Age Brains – NJN News Healthwatch Report](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-6>

Unlike our physical abilities, which peak in our mid-20s and then begin a slow decline, our cognitive abilities remain steady throughout early and middle adulthood. Our **crystallized intelligence** (*information, skills, and strategies we have gathered through a lifetime of experience*) tends to hold steady as we age—it may even improve. For example, adults show relatively stable to increasing scores on intelligence tests until their mid-30s to mid-50s (Bayley & Oden, 1955). However, in late adulthood we begin to experience a decline in another area of our cognitive abilities—**fluid intelligence** (*information processing abilities, reasoning, and memory*). These processes become slower. How can we delay the onset of cognitive decline? Mental and physical activity seem to play a part. Research has found adults who engage in mentally and physically stimulating activities experience less cognitive decline and have a reduced incidence of mild cognitive impairment and dementia (Hertzog, Kramer, Wilson, & Lindenberger, 2009; Larson et al., 2006; Podewils et al., 2005).



Cognitive activities such as playing mahjong, chess, or other games can keep you mentally fit. The same is true for solo pastimes like reading and completing crossword puzzles. (credit: Philippe Put)

Psychosocial Development

There are many theories about the social and emotional aspects of aging. Some aspects of healthy aging include activities, social connectedness, and the role of a person's culture. According to many theorists, including George Vaillant (2002), who studied and analyzed over 50 years of data, we need to have and continue to find meaning throughout our lives. For those in early and middle adulthood, meaning is found through work (Sterns & Huyck, 2001) and family life (Markus, Ryff, Curan, & Palmersheim, 2004). These areas relate to the tasks that Erikson referred to as generativity and intimacy. As mentioned previously, adults tend to define themselves by what they do—their careers. Earnings peak during this time, yet job satisfaction is more closely tied to work that involves contact with other people, is interesting, provides opportunities for advancement, and allows some independence (Mohr & Zoghi, 2006) than it is to salary (Iyengar, Wells, & Schwartz, 2006). How might being unemployed or being in a dead-end job challenge adult well-being?

Positive relationships with significant others in our adult years have been found to contribute to a state of well-being (Ryff & Singer, 2009). Most adults in the United States identify themselves through their relationships with family—particularly with spouses, children, and parents (Markus et al., 2004). While raising children can be stressful, especially when they are young, research suggests that parents reap the rewards down the road, as adult children tend to have a positive effect on parental well-being (Umberson, Pudrovska, & Reczek, 2010). Having a stable marriage has also been found to contribute to well-being throughout adulthood (Vaillant, 2002).

Another aspect of positive aging is believed to be social connectedness and social support. As we get older, socioemotional selectivity theory suggests that our social support and friendships dwindle in number but remain as close, if not closer, than in our earlier years (Carstensen, 1992).



Social support is important as we age. (credit: Gabriel Rocha)

To learn more, view this video on aging in America:
[The Many Faces of Aging In America.](#)



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=599#oembed-7>

Summary

At conception, the egg and sperm cell are united to form a zygote, which will begin to divide rapidly. This marks the beginning of the first stage of prenatal development (germinal stage), which lasts about 2 weeks. Then the zygote implants itself into the lining of the woman's uterus, marking the beginning of the second stage of prenatal development (embryonic stage), which lasts about 6 weeks. The embryo begins to develop body and organ structures, and the neural tube forms, which will later become the brain and spinal cord. The third phase of prenatal development (fetal stage) begins at 9 weeks and lasts until birth. The body, brain, and organs grow rapidly during this stage. During all stages of pregnancy it is important that the mother receive prenatal care to reduce health risks to herself and to her developing baby.

Newborn infants weigh about 7.5 pounds. Doctors assess a newborn's reflexes, such as the sucking, rooting, and Moro reflexes. Our physical, cognitive, and psychosocial skills grow and change as we move through developmental stages from infancy through late adulthood. Attachment in infancy is a critical component of healthy development. Parenting styles have been found to have an effect on childhood outcomes of well-being. The transition from adolescence to adulthood can be challenging due to the timing of puberty, and due to the extended amount of time spent in emerging adulthood. Although physical decline begins in middle adulthood, cognitive decline does not begin until later. Activities that keep the body and mind active can help maintain good physical and cognitive health as we age. Social supports through family and friends remain important as we age.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=599#h5p-163>

Critical Thinking Questions

What are some known teratogens, and what kind of damage can they do to the developing fetus?

Alcohol is a teratogen. Excessive drinking can cause intellectual disabilities in children. The child can also have a small head and abnormal facial features, which are characteristic of fetal alcohol syndrome (FAS). Another teratogen is nicotine. Smoking while pregnant can lead to low-birth weight, premature birth, stillbirth, and SIDS.

What is prenatal care and why is it important?

Prenatal care is medical care during pregnancy that monitors the health of both the mother and fetus. It's important to receive prenatal care because it can reduce complications to the mother and fetus during pregnancy.

Describe what happens in the embryonic stage of development. Describe what happens in the fetal stage of development.

In the embryonic stage, basic structures of the embryo start to develop into areas that will become the head, chest, and abdomen. The heart begins to beat and organs form and begin to function. The neural tube forms along the back of the embryo, developing into the spinal cord and brain. In the fetal stage, the brain and body continue to develop. Fingers and toes develop along with hearing, and internal organs form.

What makes a personal quality part of someone's personality?

The particular quality or trait must be part of an enduring behavior pattern, so that it is a consistent or predictable quality.

Describe some of the newborn reflexes. How might they promote survival?

The sucking reflex is the automatic, unlearned sucking motions that infants do with their mouths. It may help promote survival because this action helps the baby take in nourishment.

The rooting reflex is the newborn's response to anything that touches her cheek. When you stroke a baby's cheek, she will naturally turn her head that way and begin to suck. This may aid survival because it helps the newborn locate a source of food.

Compare and contrast the four parenting styles and describe the kinds of childhood outcomes we can expect with each.

With the authoritative style, children are given reasonable demands and consistent limits, warmth and affection are expressed, the parent listens to the child's point of view, and the child initiates positive standards. Children raised by authoritative parents tend to have high self-esteem and social skills. Another parenting style is authoritarian: The parent places a high value on conformity and obedience. The parents are often strict, tightly monitor their children, and express little warmth. This style can create anxious, withdrawn, and unhappy kids. The third parenting style is permissive: Parents make few demands, rarely use punishment, and give their children free rein. Children raised by permissive parents tend to lack self-discipline, which

contributes to poor grades and alcohol abuse. However, they have higher self-esteem, better social skills, and lower levels of depression. The fourth style is the uninvolved parent: They are indifferent, uninvolved, and sometimes called neglectful. The children raised in this parenting style are usually emotionally withdrawn, fearful, anxious, perform poorly in school, and are at an increased risk of substance abuse.

What is emerging adulthood and what are some factors that have contributed to this new stage of development?

Emerging adulthood is a relatively new period of lifespan development from 18 years old to the mid-20s, characterized as a transitional time in which identity exploration focuses on work and love. According to Arnett, changing cultural expectations facilitate the delay to full adulthood. People are spending more time exploring their options, so they are delaying marriage and work as they change majors and jobs multiple times, putting them on a much later timetable than their parents.

Personal Application Questions

1. Which parenting style describes how you were raised? Provide an example or two to support your answer.
2. Would you describe your experience of puberty as one of pride or embarrassment? Why?
3. Your best friend is a smoker who just found out she is pregnant. What would you tell her about smoking and pregnancy?
4. Imagine you are a nurse working at a clinic that provides prenatal care for pregnant women. Your patient, Anna, has heard that it's a good idea to play music for her unborn baby, and she wants to know when her baby's hearing will develop. What will you tell her?

30.

DEATH AND DYING

Learning Objectives

By the end of this section, you will be able to:

- Discuss hospice care
- Describe the five stages of grief

Every story has an ending. Death marks the end of your life story. Our culture and individual backgrounds influence how we view death. In some cultures, death is accepted as a natural part of life and is embraced. In contrast, until about 50 years ago in the United States, a doctor might not inform someone that they were dying, and the majority of deaths occurred in hospitals. In 1967 that reality began to change with Cicely Saunders, who created the first modern hospice in England. The aim of **hospice** *is to help provide a death with dignity and pain management in a humane and comfortable environment, which is usually outside of a hospital setting*. In 1974, Florence Wald founded the first hospice in the United States. Today, hospice provides care for 1.65 million Americans and their families. Because of hospice care, many terminally ill people are able to spend their last days at home.



In some cultures, people's bodies may be buried in a cemetery after death. (credit: Christina Rutz)

Research has indicated that hospice care is beneficial for the patient (Brumley, Enquidanos, & Cherin, 2003; Brumley et al., 2007; Godkin, Krant, & Doster, 1984) and for the patient's family (Rhodes, Mitchell, Miller, Connor, & Teno, 2008; Godkin et al., 1984). Hospice patients report high levels of satisfaction with hospice care because they are able to remain at home and are not completely dependent on strangers for care (Brumley et al., 2007). In addition, hospice patients tend to live longer than non-hospice patients (Connor, Pyenson, Fitch, Spence, & Iwasaki, 2007; Temel et al., 2010). Family members receive emotional support and are regularly informed of their loved one's treatment and condition. The family member's burden of care is also reduced (McMillan et al., 2006). Both the patient and the patient's family members report increased family support, increased social support, and improved coping while receiving hospice services (Godkin et al., 1984).

How do you think you might react if you were diagnosed with a terminal illness like cancer? Elizabeth Kübler-Ross (1969), who worked with the founders of hospice care, described the process of an individual accepting his own death. She proposed **five stages of grief**: *denial, anger, bargaining, depression, and acceptance*. Most individuals experience these stages, but the stages may occur in different orders, depending on the individual. In addition, not all people experience all of the stages. It is also important to note that some psychologists believe that the more a dying person fights death, the more likely he is to remain stuck in the denial phase. This could make it difficult for the dying person to face death with dignity. However, other psychologists believe that not facing death until the very end is an adaptive coping mechanism for some people.

1. Denial: "I feel fine." "This can't be happening; not to me."
2. Anger: "Why me? It's not fair!" "How can this happen to me?" "Who is to blame?"
3. Bargaining: "Just let me live to see my children graduate." "I'd do anything for a few more years." "I'd give my life savings if..."
4. Depression: "I'm so sad, why bother with anything?" "I'm going to die. What's the point?" "I miss my

loved ones—why go on?”

5. Acceptance: “I know my time has come; it’s almost my time.”

Whether due to illness or old age, not everyone facing death or the loss of a loved one experiences the negative emotions outlined in the Kübler-Ross model (Nolen-Hoeksema & Larson, 1999). For example, research suggests that people with religious or spiritual beliefs are better able to cope with death because of their hope in an afterlife and because of social support from religious or spiritual associations (Hood, Spilka, Hunsberger, & Corsuch, 1996; McIntosh, Silver, & Wortman, 1993; Paloutzian, 1996; Samarel, 1991; Wortman & Park, 2008).

A prominent example of a person creating meaning through death is Randy Pausch, who was a well-loved and respected professor at Carnegie Mellon University. Diagnosed with terminal pancreatic cancer in his mid-40s and given only 3–6 months to live, Pausch focused on living in a fulfilling way in the time he had left. Instead of becoming angry and depressed, he presented his now famous last lecture called “Really Achieving Your Childhood Dreams.” In his moving yet humorous talk, he shares his insights on seeing the good in others, overcoming obstacles, and experiencing zero gravity, among many other things. Despite his terminal diagnosis, Pausch lived the final year of his life with joy and hope, showing us that our plans for the future still matter, even if we know that we are dying.

Really Achieving Your Childhood Dreams is Randy Pausch’s last lecture. Listen to his inspiring talk: [Randy Pausch Last Lecture: Achieving Your Childhood Dreams](https://www.youtube.com/watch?v=601#oembed-1).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=601#oembed-1>

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=601#h5p-165>



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=601#h5p-166>



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=601#h5p-167>

Summary

Death marks the endpoint of our lifespan. There are many ways that we might react when facing death. Kübler-Ross developed a five-stage model of grief as a way to explain this process. Many people facing death choose hospice care, which allows their last days to be spent at home in a comfortable, supportive environment.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=601#h5p-168>

Critical Thinking Questions

Describe the five stages of grief and provide examples of how a person might react in each stage.

The first stage is denial. The person receives news that he is dying, and either does not take it seriously or tries to escape from the reality of the situation. He might say something like, “Cancer could never happen to me. I take good care of myself. This has to be a mistake.” The next stage is anger. He realizes time is short, and he may not have a chance to accomplish what he wanted in life. “It’s not fair. I promised my grandchildren that we would go to Disney World, and now I’ll never have the chance to take them.” The third stage is bargaining. In this stage, he tries to delay the inevitable by bargaining or pleading for extra time, usually with God, family members, or medical care providers. “God, just give me one more year so I can take that trip with my grandchildren. They’re too young to understand what’s happening and why I can’t take them.” The fourth stage is depression. He becomes sad about his impending death. “I can’t believe this is how I’m going to die. I’m in so much pain. What’s going to become of my family when I’m gone?” The final stage is acceptance. This stage is usually reached in the last few days or weeks before death. He recognizes that death is inevitable. “I need to get everything in order and say all of my good-byes to the people I love.”

What is the purpose of hospice care?

Hospice is a program of services that provide medical, social, and spiritual support for dying people and their families.

Personal Application Questions

1. Have you ever had to cope with the loss of a loved one? If so, what concepts described in this section provide context that may help you understand your experience and process of grieving?
2. If you were diagnosed with a terminal illness would you choose hospice care or a traditional death in a hospital? Why?

31.

REFERENCES

Ainsworth, M. D. S., & Bell, S. M. (1970). Attachment, exploration, and separation: Illustrated by the behavior of one-year-olds in a strange situation. *Child Development*, 41, 49–67.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.

American Academy of Pediatrics. (2007). The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*, 199(1), 182–191.

Amsterdam, B. (1972). Mirror image reactions before age two. *Developmental Psychobiology*, 5, 297–305.

Archer, J. (1992). *Ethology and human development*. New York, NY: Harvester Wheatsheaf.

Arnett, J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480.

Ashley, S. J., Magnuson, S. I., Omnell, L. M., & Clarren, S. K. (1999). Fetal alcohol syndrome: Changes in craniofacial form with age, cognition, and timing of ethanol exposure in the macaque. *Teratology*, 59(3), 163–172.

Bahr, S. J., & Hoffman, J. P. (2010). Parenting style, religiosity, peers, and adolescent heavy drinking. *Journal of Studies on Alcohol and Drugs*, 71, 539–543.

Baillargeon, R. (2004). Infants' reasoning about hidden objects: Evidence for event-general and event-specific expectations. *Developmental Science*, 7(4), 391–424.

Baillargeon, R. (1987). Young infants' reasoning about the physical and spatial properties of a hidden object. *Cognitive Development*, 2(3), 179–200.

Baillargeon, R., Li, J., Gertner, Y., & Wu, D. (2011). How do infants reason about physical events. *The Wiley-Blackwell handbook of childhood cognitive development*, 2, 11–48.

Barber, B. K. (1994). Cultural, family, and person contexts of parent-adolescent conflict. *Journal of Marriage and the Family*, 56, 375–386.

Basseches, M. (1984). Dialectical thinking as metasystematic form of cognitive organization. In M. L. Commons, F. A. Richards, & C. Armon (Eds.), *Beyond formal operations: Late adolescent and adult cognitive development* (pp. 216–238). New York, NY: Praeger.

Baumrind, D. (1971). Current patterns of parental authority. *Developmental Psychology*, 4(1, Pt. 2), 1–103. doi:10.1037/h0030372

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *Journal of Early Adolescence*, 11(1), 56–95.

- Bayley, N., & Oden, M. H. (1955). The maintenance of intellectual ability in gifted adults. *Journal of Gerontology*, 10, 91–107.
- Bjorklund, D. F. (1987). A note on neonatal imitation. *Developmental Review*, 7, 86–92.
- Blossom, M., & Morgan, J. L. (2006). Does the face say what the mouth says? A study of infants' sensitivity to visual prosody. In *30th annual Boston University conference on language development, Somerville, MA*.
- Bogartz, R. S., Shinsky, J. L., & Schilling, T. (2000). *Infancy*, 1(4), 403–428.
- Bowlby, J. (1969). *Attachment and loss: Attachment* (Vol. 1). New York, NY: Basic Books.
- Bowlby, J. (1988). *A secure base: Parent-child attachment and health human development*. New York, NY: Basic Books.
- Brumley, R., Enquidanos, S., Jamison, P., Seitz, R., Morgenstern, N., Saito, S., . . . Gonzalez, J. (2007). Increased satisfaction with care and lower costs: Results of a randomized trial of in-home palliative care. *Journal of the American Geriatric Society*, 55(7), 993–1000.
- Brumley, R. D., Enquidanos, S., & Cherin, D. A. (2003). Effectiveness of a home-based palliative care program for end-of-life. *Journal of Palliative Medicine*, 6(5), 715–724.
- Callaghan, T. C., Rochat, P., Lillard, A., Claux, M. L., Odden, H., Itakura, S., . . . Singh, S. (2005). Synchrony in the onset of mental-state reasoning. *Psychological Science*, 16, 378–384.
- Carel, J.-C., Lahlou, N., Roger, M., & Chaussain, J. L. (2004). Precocious puberty and statural growth. *Human Reproduction Update*, 10(2), 135–147.
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity. *Psychology and Aging*, 7(3), 331–338.
- Case, R. (1985). *Intellectual development: Birth to Adulthood*. New York, NY: Academic.
- Casey, B. J., Tottenham, N., Liston, C., & Durston, S. (2005). Imaging the developing brain: What have we learned about cognitive development? *TRENDS in Cognitive Sciences*, 19(3), 104–110.
- Centers for Disease Control and Prevention. (2013). *Smoking during pregnancy*. Retrieved from http://www.cdc.gov/tobacco/basic_information/health_effects/pregnancy/
- Chick, K., Heilman-Houser, R., & Hunter, M. (2002). The impact of child care on gender role development and gender stereotypes. *Early Childhood Education Journal*, 29(3), 149–154.
- Chomsky, N. (1957). *Syntactic structures*. The Hague, Netherlands: Mouton.
- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*, 5(1), 68–80.
- Commons, M. L., & Bresette, L. M. (2006). Illuminating major creative scientific innovators with postformal stages. In C. Hoare (Ed.), *Handbook of adult development and learning* (pp. 255–280). New York, NY: Oxford University Press.
- Connor, S. R., Pyenson, B., Fitch, K., Spence, C., & Iwasaki, K. (2007). Comparing hospice and nonhospice patient survival among patients who die within a three-year window. *Journal of Pain and Symptom Management*, 33(3), 238–246.

- Courage, M. L., & Howe, M. L. (2002). From infant to child: The dynamics of cognitive change in the second year of life. *Psychological Bulletin*, 128, 250–277.
- Curtiss, S. (1981). Dissociations between language and cognition: Cases and implications. *Journal of Autism and Developmental Disorders*, 11(1), 15–30.
- Darling, N. (1999). *Parenting style and its correlates*. Retrieved from ERIC database (EDO-PS-99-3) <http://ecap.crc.illinois.edu/eeearchive/digests/1999/darlin99.pdf>
- de Hevia, M. D., & Spelke, E. S. (2010). Number-space mapping in human infants. *Psychological Science*, 21(5), 653–660.
- Dennett, D. (1987). *The intentional stance*. Cambridge, MA: MIT Press.
- Diamond, A. (2009). The interplay of biology and the environment broadly defined. *Developmental Psychology*, 45(1), 1–8.
- Donenberg, G. R., Wilson, H. W., Emerson, E., Bryant, F. B. (2002). Holding the line with a watchful eye: The impact of perceived parental permissiveness and parental monitoring on risky sexual behavior among adolescents in psychiatric care. *AIDS Education Prevention*, 14(2), 138–157.
- Dornbusch, S. M., Ritter, P. L., Leiderman, P. H., Roberts, D. F., & Fraleigh, M. J. (1987). The relation of parenting style to adolescent school performance. *Child Development*, 58(5), 1244–1257.
- Duncan, G. J., & Magnuson, K. A. (2005). Can family socioeconomic resources account for racial and ethnic test score gaps? *The Future of Children*, 15(1), 35–54.
- Erikson, E. H. (1963). *Childhood and Society* (2nd ed.). New York, NY: Norton.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York, NY: Norton.
- Ferrer, M., & Fugate, A. (2003). *Helping your school-age child develop a healthy self-concept*. Retrieved from http://edis.ifas.ufl.edu/fy570#FOOTNOTE_2
- Figdor, E., & Kaeser, L. (1998). Concerns mount over punitive approaches to substance abuse among pregnant women. *The Guttmacher Report on Public Policy* 1(5), 3–5.
- Fischer, K. W., Yan, Z., & Stewart, J. (2003). Adult cognitive development: Dynamics in the developmental web. In J. Valsiner & K. Connolly (Eds.), *Handbook of developmental psychology* (pp. 491–516). Thousand Oaks, CA: Sage Publications.
- Flannery, D. J., Rowe, D. C., & Gulley, B. L. (1993). Impact of pubertal status, timing, and age on adolescent sexual experience and delinquency. *Journal of Adolescent Research*, 8, 21–40.
- Freud, S. (1909). Analysis of a phobia in a five-year-old boy. In *Collected Papers: Volume 111, Case Histories (1949)* (pp. 149–289). Hogarth Press: London.
- Fromkin, V., Krashen, S., Curtiss, S., Rigler, D., & Rigler, M. (1974). The development of language in Genie: A case of language acquisition beyond the critical period. *Brain and Language*, 1, 81–107.
- Galambos, N. L., & Almeida, D. M. (1992). Does parent-adolescent conflict increase in early adolescence? *Journal of Marriage and the Family*, 54, 737–747.
- Ganger, J., & Brent, M.R. (2004). Reexamining the vocabulary spurt. *Developmental Psychology*, 40(4), 621–632.

- Ge, X., Conger, R. D., & Elder, G. H. (2001). Pubertal transition, stressful life events, and the emergence of gender differences in adolescent depressive symptoms. *Developmental Psychology*, 37, 404–417.
- Gervai, J. (2009). Environmental and genetic influences on early attachment. *Child and Adolescent Psychiatry and Mental Health*, 3, 25.
- Gesell, A. (1933). Maturation and the patterning of behavior. In C. Murchison (Ed.), *A handbook of child psychology* (2nd ed., pp. 209–235). Worcester, MA: Clark University Press.
- Gesell, A. (1939). *Biographies of child development*. New York, NY: Paul B. Hoeber.
- Gesell, A. (1940). *The first five years of life*. New York, NY: Harper.
- Gesell, A., & Ilg, F. L. (1946). *The child from five to ten*. New York, NY: Harper.
- Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge, MA: Harvard University Press.
- Gleitman, L.R., & Newport, E. L. (1995). The invention of language by children: Environmental and biological influences on the acquisition of language. In D.N. Osherson, L.R. Gleitman, & M. Liberman (Eds.), *An invitation to cognitive science: Language* (pp. 1–24). Cambridge, MA: The MIT Press.
- Gleitman, L. R., & Newport, E. L. (1995). The invention of language by children: Environmental and biological influences on the acquisition of language. In L. R. Gleitman & M. Liberman (Eds.), *An invitation to cognitive science, Vol. 1: Language*. (2nd ed.) (pp. 1–24). Cambridge, MA: MIT Press.
- Godkin, M., Krant, M., & Doster, N. (1984). The impact of hospice care on families. *International Journal of Psychiatry in Medicine*, 13, 153–165.
- Graber, J. A., Lewinsohn, P. M., Seeley, J. R., & Brooks-Gunn, J. (1997). Is psychopathology associated with the timing of pubertal development? *Journal of the Academy of Child and Adolescent Psychiatry*, 36, 1768–1776.
- Hair, E. C., Moore, K. A., Garrett, S. B., Kinukawa, A., Lippman, L., & Michelson, E. (2005). The parent-adolescent relationship scale. In L. Lippman (Ed.), *Conceptualizing and Measuring Indicators of Positive Development: What Do Children Need to Flourish?* (pp. 183–202). New York, NY: Kluwer Academic/Plenum Press.
- Hall, S. S. (2004, May). The good egg. *Discover*, 30–39.
- Hall, G. S. (1904). *Adolescence*. New York, NY: Appleton.
- Harlow, H. (1958). The nature of love. *American Psychologist*, 13, 673–685.
- Harris, J. R. (2009). *The nurture assumption: Why children turn out the way they do* (2nd ed.). New York, NY: Free Press.
- Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap. *American Educator*, 27(1), 4–9.
- Hatch, E. (1983). *Psycholinguistics: A second language perspective*. Rowley, MA: Newbury House.
- Hertzog, C., Kramer, A. F., Wilson, R. S., & Lindenberger, U. (2009). Enrichment effects on adult cognitive development. *Psychological Science in the Public Interest*, 9(1), 1–65.

- Hood, R. W., Jr., Spilka, B., Hunsberger, B., & Corsuch, R. (1996). *The psychology of religion: An empirical approach* (2nd ed.). New York, NY: Guilford.
- Huebler, F. (2005, December 14). International education statistics [Web log post]. Retrieved from <http://huebler.blogspot.com/2005/12/age-and-level-of-education-in-nigeria.html>
- Hutchinson, N. (2011). A geographically informed vision of skills development. *Geographical Education*, 24, 15.
- Huttenlocher, P. R., & Dabholkar, A. S. (1997). Regional differences in synaptogenesis in human cerebral cortex. *Journal of Comparative Neurology*, 387(2), 167–178.
- Iverson, J.M., & Goldin-Meadow, S. (2005). Gesture paves the way for language development. *Psychological Science*, 16(5), 367–71.
- Iyengar, S. S., Wells, R. E., & Schwartz, B. (2006). Doing better but feeling worse: Looking for the best job undermines satisfaction. *Psychological Science*, 17, 143–150.
- Jos, P. H., Marshall, M. F., & Perlmutter, M. (1995). The Charleston policy on cocaine use during pregnancy: A cautionary tale. *The Journal of Law, Medicine & Ethics*, 23(2), 120–128.
- Kaltiala-Heino, R. A., Rimpela, M., Rissanen, A., & Rantanen, P. (2001). Early puberty and early sexual activity are associated with bulimic-type eating pathology in middle adolescence. *Journal of Adolescent Health*, 28, 346–352.
- Kaplan, H., & Dove, H. (1987). Infant development among the Aché of Eastern Paraguay. *Developmental Psychology*, 23, 190–198.
- Karasik, L. B., Adolph, K. E., Tamis-LeMonda, C. S., & Bornstein, M. H. (2010). WEIRD Walking: Cross-cultural research on motor development. *Behavioral & Brain Sciences*, 33(2-3), 95–96.
- Karnik, S., & Kanekar, A. (2012). Childhood obesity: A global public health crisis. *International Journal of Preventive Medicine*, 3(1), 1–7.
- Kohlberg, L. (1969). Stage and sequence: The cognitive-developmental approach to socialization. In D. A. Goslin (Ed.), *Handbook of socialization theory and research* (p. 379). Chicago, IL: Rand McNally.
- Kolb, B., & Whishaw, I. Q. (2009). *Fundamentals of human neuropsychology*. New York, NY: Worth.
- Kübler-Ross, E. (1969). *On death and dying*. New York, NY: Macmillan.
- Labouvie-Vief, G., & Diehl, M. (1999). Self and personality development. In J. C. Cavanaugh & S. K. Whitbourne (Eds.), *Gerontology: An interdisciplinary perspective* (pp. 238–268). New York, NY: Oxford University Press.
- Larson, E. B., Wang, L., Bowen, J. D., McCormick, W. C., Teri, L., Crane, P., & Kukull, W. (2006). Exercise is associated with reduced risk for incident dementia among persons 65 years of age or older. *Annals of Internal Medicine*, 144, 73–81.
- Lee, V. E., & Burkam, D. T. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economic Policy Institute.
- Lobo, I. (2008). Environmental influences on gene expression. *Nature Education* 1(1), 39.

- Loop, E. (2013). *Major milestones in cognitive development in early childhood*. Retrieved from <http://everydaylife.globalpost.com/major-milestones-cognitive-development-early-childhood-4625.html>
- Maccoby, E. (1980). *Social development: Psychological growth and the parent-child relationship*. New York, NY: Harcourt Brace Jovanovich.
- MacFarlane, A. (1978, February). What a baby knows. *Human Nature*, 74–81.
- Maier, S. E., & West, J. R. (2001). Drinking patterns and alcohol-related birth defects. *Alcohol Research & Health*, 25(3), 168–174.
- Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the Preschool Years* (pp. 121–160). Chicago, IL: University of Chicago Press.
- Markus, H. R., Ryff, C. D., Curan, K., & Palmersheim, K. A. (2004). In their own words: Well-being at midlife among high school-educated and college-educated adults. In O. G. Brim, C. D. Ryff, & R. C. Kessler (Eds.), *How healthy are we? A national study of well-being at midlife* (pp. 273–319). Chicago, IL: University of Chicago Press.
- McIntosh, D. N., Silver, R. C., & Wortman, C. B. (1993). Religion's role in adjustment to a negative life event: Coping with the loss of a child. *Journal of Personality and Social Psychology*, 65, 812–821.
- McMillan, S. C., Small, B. J., Weitzner, M., Schonwetter, R., Tittle, M., Moody, L., & Haley, W. E. (2006). Impact of coping skills intervention with family caregivers of hospice patients with cancer. *Cancer*, 106(1), 214–222.
- Miklikowska, M., Duriez, B., & Soenens, B. (2011). Family roots of empathy-related characteristics: The role of perceived maternal and paternal need support in adolescence. *Developmental Psychology*, 47(5), 1342–1352.
- Mills, M., & Melhuish, E. (1974). Recognition of mother's voice in early infancy. *Nature*, 252, 123–124.
- Mohr, R. D., & Zoghi, C. (2006). Is job enrichment really enriching? (U.S. Bureau of Labor Statistics Working Paper 389). Washington, DC: U.S. Bureau of Labor Statistics. Retrieved from <http://www.bls.gov/ore/pdf/ec060010.pdf>
- Moore, K. A., Guzman, L., Hair, E. C., Lippman, L., & Garrett, S. B. (2004). Parent-teen relationships and interactions: Far more positive than not. *Child Trends Research Brief*, 2004-25. Washington, DC: Child Trends.
- National Institutes of Health. (2013). *What is prenatal care and why is it important?* Retrieved from <http://www.nichd.nih.gov/health/topics/pregnancy/conditioninfo/Pages/prenatal-care.aspx>
- Nolen-Hoeksema, S., & Larson, J. (1999). *Coping with loss*. Mahwah, NJ: Erlbaum.
- Overman, W. H., Bachevalier, J., Turner, M., & Peuster, A. (1992). Object recognition versus object discrimination: Comparison between human infants and infant monkeys. *Behavioral Neuroscience*, 106, 15–29.
- Paloutzian, R. F. (1996). *Invitation to the psychology of religion*. Boston, MA: Allyn & Bacon.
- Parent, J., Forehand, R., Merchant, M. J., Edwards, M. C., Conners-Burrow, N. A., Long, N., & Jones, D.

- J. (2011). The relation of harsh and permissive discipline with child disruptive behaviors: Does child gender make a difference in an at-risk sample? *Journal of Family Violence*, 26, 527–533.
- Piaget, J. (1954). *The construction of reality in the child*. New York: Basic Books.
- Pickens, J. (1994). Full-term and preterm infants' perception of face-voice synchrony. *Infant Behavior and Development*, 17, 447–455.
- Piaget, J. (1930). *The child's conception of the world*. New York, NY: Harcourt, Brace & World.
- Piaget, J. (1932). *The moral judgment of the child*. New York, NY: Harcourt, Brace & World.
- Podewils, L. J., Guallar, E., Kuller, L. H., Fried, L. P., Lopez, O. L., Carlson, M., & Lyketsos, C. G. (2005). Physical activity, APOE genotype, and dementia risk: Findings from the Cardiovascular Health Cognition Study. *American Journal of Epidemiology*, 161, 639–651.
- Pollack, W., & Shuster, T. (2000). *Real boys' voices*. New York, NY: Random House.
- Rhodes, R. L., Mitchell, S. L., Miller, S. C., Connor, S. R., & Teno, J. M. (2008). Bereaved family members' evaluation of hospice care: What factors influence overall satisfaction with services? *Journal of Pain and Symptom Management*, 35, 365–371.
- Risley, T. R., & Hart, B. (2006). Promoting early language development. In N. F. Watt, C. Ayoub, R. H. Bradley, J. E. Puma, & W. A. LeBoeuf (Eds.), *The crisis in youth mental health: Early intervention programs and policies* (Vol. 4, pp. 83–88). Westport, CT: Praeger.
- Rothbaum, R., Weisz, J., Pott, M., Miyake, K., & Morelli, G. (2000). Attachment and culture: Security in the United States and Japan. *American Psychologist*, 55, 1093–1104.
- Russell, S. T., Crockett, L. J., & Chao, R. (Eds.). (2010). Asian American parenting and parent-adolescent relationships. In R. Levesque (Series Ed.), *Advancing responsible adolescent development*. New York, NY: Springer.
- Ryff, C. D., & Singer, B. (2009). Understanding healthy aging: Key components and their integration. In V. L. Bengtson, D. Gans, N. M. Putney, & M. Silverstein. (Eds.), *Handbook of theories of aging* (2nd ed., pp. 117–144). New York, NY: Springer.
- Samarel, N. (1991). *Caring for life after death*. Washington, DC: Hemisphere.
- Sanson, A., & Rothbart, M. K. (1995). Child temperament and parenting. In M. Bornstein (Ed.), *Applied and practical parenting* (Vol. 4, pp. 299–321). Mahwah, NJ: Lawrence Erlbaum.
- Schechter, C., & Byeb, B. (2007). Preliminary evidence for the impact of mixed-income preschools on low-income children's language growth. *Early Childhood Research Quarterly*, 22, 137–146.
- Shamay-Tsoory, S. G., Tomer, R., & Aharon-Peretz, J. (2005). The neuroanatomical basis of understanding sarcasm and its relationship to social cognition. *Neuropsychology*, 19(3), 288–300.
- Shanahan, L., McHale, S. M., Osgood, D. W., & Crouter, A. C. (2007). Conflict frequency with mothers and fathers from middle childhood to late adolescence: Within and between family comparisons. *Developmental Psychology*, 43, 539–550.
- Siegler, R. S. (2005). *Children's thinking* (4th ed). Mahwah, NJ: Erlbaum.

- Siegler, R. S. (2006). Microgenetic analyses of learning. In D. Kuhn & R. S. Siegler (Eds.), *Handbook of child psychology: Cognition, perception, and language* (6th ed., Vol. 2). New York: Wiley.
- Sinnott, J. D. (1998). *The development of logic in adulthood: Postformal thought and its applications*. New York, NY: Springer.
- Small, M. F. (1999). *Our babies, ourselves: How biology and culture shape the way we parent*. New York, NY: Anchor Books.
- Spelke, E.S., & Cortelyou, A. (1981). Perceptual aspects of social knowing: Looking and listening in infancy. In M.E. Lamb & L.R. Sherrod (Eds.), *Infant social cognition: Empirical and theoretical considerations* (pp. 61–83). Hillsdale, NJ: Erlbaum.
- Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, 52, 83–110.
- Sterns, H. L., & Huyck, M. H. (2001). The role of work in midlife. In M. Lachman (Ed.), *The handbook of midlife development* (pp. 447–486). New York, NY: Wiley.
- Steven L. Youngentob, et. al. (2007). Experience-induced fetal plasticity: The effect of gestational ethanol exposure on the behavioral and neurophysiologic olfactory response to ethanol odor in early postnatal and adult rats. *Behavioral Neuroscience*, 121(6), 1293–1305.
- Stork, F. C., & Widdowson, D. A. (1974). *Learning about linguistics*. London, UK: Hutchinson Ltd.
- Streissguth, A. P., Bookstein, F. L., Barr, H. M., Sampson, P. D., O'Malley, K., & Young, J. K. (2004). Risk factors for adverse life outcomes in fetal alcohol syndrome and fetal alcohol effects. *Developmental and Behavioral Pediatrics*, 25(4), 228–238.
- Striegel-Moore, R. H., & Cachelin, F. M. (1999). Body image concerns and disordered eating in adolescent girls: Risk and protective factors. In N. G. Johnson, M. C. Roberts, & J. Worell (Eds.), *Beyond appearance: A new look at adolescent girls*. Washington, DC: American Psychological Association.
- Tanner, J. M. (1978). *Fetus into man: Physical growth from conception to maturity*. Cambridge, MA: Harvard University Press.
- Temel, J. S., Greer, J. A., Muzikansky, A., Gallagher, E. R., Admane, S., Jackson, V. A. . . . Lynch, T. J. (2010). Early palliative care for patients with metastatic non-small-cell lung cancer. *New England Journal of Medicine*, 363, 733–742.
- Thomas, A. (1984). Temperament research: Where we are, where we are going. *Merrill-Palmer Quarterly*, 30(2), 103–109.
- Tran, T. D., & Kelly, S. J. (2003). Critical periods for ethanol-induced cell loss in the hippocampal formation. *Neurotoxicology and Teratology*, 25(5), 519–528.
- Umberson, D., Pudrovska, T., & Reczek, C. (2010). Parenthood, childlessness, and well-being: A life course perspective. *Journal of Marriage and the Family*, 72(3), 612–629.
- United Nations Educational, Scientific and Cultural Organization. (2013, June). *UIS Fact Sheet: Schooling for millions of children jeopardized by reductions in aid*. Montreal, Canada: UNESCO Institute for Statistics.
- Vaillant, G. E. (2002). *Aging well*. New York, NY: Little Brown & Co.
- Van der Graaff, J., Branje, S., De Wied, M., Hawk, S., Van Lier, P., & Meeus, W. (2013). Perspective

taking and empathetic concern in adolescence: Gender differences in developmental changes. *Developmental Psychology*, 50(3), 881.

van Ijzendoorn, M. H., & Sagi-Schwartz, A. (2008). Cross-cultural patterns of attachment: Universal and contextual dimensions. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment*. New York, NY: Guilford.

Vouloumanos, A., & Werker, J. F. (2004). Tuned to the signal: The privileged status of speech for young infants. *Developmental Science*, 7, 270–276.

WHO Multicentre Growth Reference Study Group. (2006). *WHO Child growth standards: Methods and development: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age*. Geneva, Switzerland: World Health Organization.

Winerman, L. (2011). Closing the achievement gap. *Monitor of Psychology*, 42(8), 36.

Wortman, J. H., & Park, C. L. (2008). Religion and spirituality in adjustment following bereavement: An integrative review. *Death Studies*.

PART VII

LEARNING



Loggerhead sea turtle hatchlings are born knowing how to find the ocean and how to swim. Unlike the sea turtle, humans must learn how to swim (and surf). (credit “turtle”: modification of work by Becky Skiba, USFWS; credit “surfer”: modification of work by Mike Baird)

The summer sun shines brightly on a deserted stretch of beach. Suddenly, a tiny grey head emerges from the sand, then another and another. Soon the beach is teeming with loggerhead sea turtle hatchlings. Although only minutes old, the hatchlings know exactly what to do. Their flippers are not very efficient for moving across the hot sand, yet they continue onward, instinctively. Some are quickly snapped up by gulls circling overhead and others become lunch for hungry ghost crabs that dart out of their holes. Despite these dangers, the hatchlings are driven to leave the safety of their nest and find the ocean.

Not far down this same beach, Ben and his son, Julian, paddle out into the ocean on surfboards. A wave approaches. Julian crouches on his board, then jumps up and rides the wave for a few seconds before losing his balance. He emerges from the water in time to watch his father ride the face of the wave.

Unlike baby sea turtles, which know how to find the ocean and swim with no help from their parents, we are not born knowing how to swim (or surf). Yet we humans pride ourselves on our ability to learn. In fact, over thousands of years and across cultures, we have created institutions devoted entirely to learning. But have you ever asked yourself how exactly it is that we learn? What processes are at work as we come to know what we know? This chapter focuses on the primary ways in which learning occurs.

32.

WHAT IS LEARNING?

Learning Objectives

By the end of this section, you will be able to:

- Explain how learned behaviors are different from instincts and reflexes
- Define learning
- Recognize and define three basic forms of learning—classical conditioning, operant conditioning, and observational learning

Birds build nests and migrate as winter approaches. Infants suckle at their mother's breast. Dogs shake water off wet fur. Salmon swim upstream to spawn, and spiders spin intricate webs. What do these seemingly unrelated behaviors have in common? They all are *unlearned* behaviors. Both instincts and reflexes are innate behaviors that organisms are born with. Reflexes are a motor or neural reaction to a specific stimulus in the environment. They tend to be simpler than instincts, involve the activity of specific body parts and systems (e.g., the knee-jerk reflex and the contraction of the pupil in bright light), and involve more primitive centers of the central nervous system (e.g., the spinal cord and the medulla). In contrast, instincts are innate behaviors that are triggered by a broader range of events, such as aging and the change of seasons. They are more complex patterns of behavior, involve movement of the organism as a whole (e.g., sexual activity and migration), and involve higher brain centers.

Both reflexes and instincts help an organism adapt to its environment and do not have to be learned. For example, every healthy human baby has a sucking reflex, present at birth. Babies are born knowing how to suck on a nipple, whether artificial (from a bottle) or human. Nobody teaches the baby to suck, just as no one teaches a sea turtle hatchling to move toward the ocean.

Learning, like reflexes and instincts, allows an organism to adapt to its environment. But unlike instincts and reflexes, learned behaviors involve change and experience; learning is a relatively permanent change in behavior or knowledge that results from experience. In contrast to the innate behaviors discussed above,

learning involves acquiring knowledge and skills through experience. Looking back at our surfing scenario, Julian will have to spend much more time training with his surfboard before he learns how to ride the waves like his father.

Learning to surf, as well as any complex learning process (e.g., learning about the discipline of psychology), involves a complex interaction of conscious and unconscious processes. Learning has traditionally been studied in terms of its simplest components—the associations our minds automatically make between events. Our minds have a natural tendency to connect events that occur closely together or in sequence. Associative learning occurs when an organism makes connections between stimuli or events that occur together in the environment. You will see that associative learning is central to all three basic learning processes discussed in this chapter; classical conditioning tends to involve unconscious processes, operant conditioning tends to involve conscious processes, and observational learning adds social and cognitive layers to all the basic associative processes, both conscious and unconscious. These learning processes will be discussed in detail later in the chapter, but it is helpful to have a brief overview of each as you begin to explore how learning is understood from a psychological perspective.

In classical conditioning, also known as Pavlovian conditioning, organisms learn to associate events—or stimuli—that repeatedly happen together. We experience this process throughout our daily lives. For example, you might see a flash of lightning in the sky during a storm and then hear a loud boom of thunder. The sound of the thunder naturally makes you jump (loud noises have that effect by reflex). Because lightning reliably predicts the impending boom of thunder, you may associate the two and jump when you see lightning. Psychological researchers study this associative process by focusing on what can be seen and measured—behaviors. Researchers ask if one stimulus triggers a reflex, can we train a different stimulus to trigger that same reflex?

In operant conditioning, organisms learn, again, to associate events—a behavior and its consequence (reinforcement or punishment). A pleasant consequence encourages more of that behavior in the future, whereas a punishment deters the behavior. Imagine you are teaching your dog, Hodor, to sit. You tell Hodor to sit, and give him a treat when he does. After repeated experiences, Hodor begins to associate the act of sitting with receiving a treat. He learns that the consequence of sitting is that he gets a doggie biscuit. Conversely, if the dog is punished when exhibiting a behavior, it becomes conditioned to avoid that behavior (e.g., receiving a small shock when crossing the boundary of an invisible electric fence).



In operant conditioning, a response is associated with a consequence. This dog has learned that certain behaviors result in receiving a treat. (credit: Crystal Rolfe)

Observational learning extends the effective range of both classical and operant conditioning. In contrast to classical and operant conditioning, in which learning occurs only through direct experience, observational learning is the process of watching others and then imitating what they do. A lot of learning among humans and other animals comes from observational learning. To get an idea of the extra effective range that observational learning brings, consider Ben and his son Julian from the introduction. How might observation help Julian learn to surf, as opposed to learning by trial and error alone? By watching his father, he can imitate the moves that bring success and avoid the moves that lead to failure. Can you think of something you have learned how to do after watching someone else?

All of the approaches covered in this chapter are part of a particular tradition in psychology, called behaviorism, which we discuss in the next section. However, these approaches do not represent the entire study of learning. Separate traditions of learning have taken shape within different fields of psychology, such as memory and cognition, so you will find that other chapters will round out your understanding of the topic. Over time these traditions tend to converge. For example, in this chapter you will see how cognition has come to play a larger role in behaviorism, whose more extreme adherents once insisted that behaviors are triggered by the environment with no intervening thought.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=692#h5p-170>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=692#h5p-171>

Critical Thinking Questions

Compare and contrast classical and operant conditioning. How are they alike? How do they differ?

Both classical and operant conditioning involve learning by association. In classical conditioning, responses are involuntary and automatic; however, responses are voluntary and learned in operant conditioning. In classical conditioning, the event that drives the behavior (the stimulus)

comes before the behavior; in operant conditioning, the event that drives the behavior (the consequence) comes after the behavior. Also, whereas classical conditioning involves an organism forming an association between an involuntary (reflexive) response and a stimulus, operant conditioning involves an organism forming an association between a voluntary behavior and a consequence.

What is the difference between a reflex and a learned behavior?

A reflex is a behavior that humans are born knowing how to do, such as sucking or blushing; these behaviors happen automatically in response to stimuli in the environment. Learned behaviors are things that humans are not born knowing how to do, such as swimming and surfing. Learned behaviors are not automatic; they occur as a result of practice or repeated experience in a situation.

Personal Application Questions

What is your personal definition of learning? How do your ideas about learning compare with the definition of learning presented in this text?

What kinds of things have you learned through the process of classical conditioning? Operant conditioning? Observational learning? How did you learn them?

Summary

Instincts and reflexes are innate behaviors—they occur naturally and do not involve learning. In contrast, learning is a change in behavior or knowledge that results from experience. There are three main types of learning: classical conditioning, operant conditioning, and observational learning. Both classical and operant conditioning are forms of associative learning where associations are made between events that occur together. Observational learning is just as it sounds: learning by observing others.

33.

CLASSICAL CONDITIONING

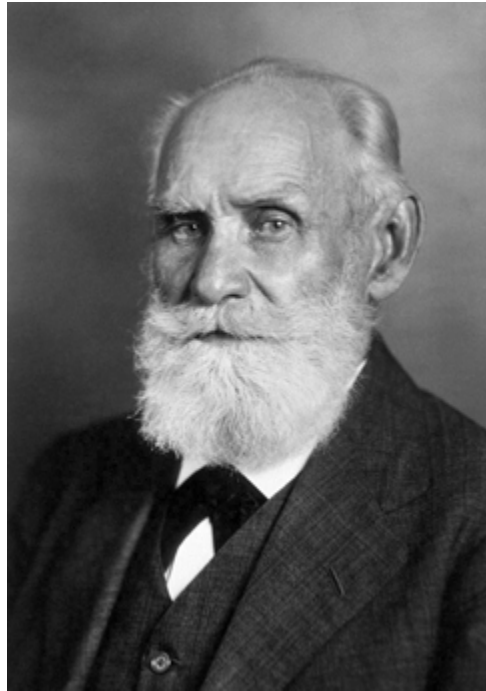
Learning Objectives

By the end of this section, you will be able to:

- Explain how classical conditioning occurs
- Summarize the processes of acquisition, extinction, spontaneous recovery, generalization, and discrimination

Does the name Ivan Pavlov ring a bell? Even if you are new to the study of psychology, chances are that you have heard of Pavlov and his famous dogs.

Pavlov (1849–1936), a Russian scientist, performed extensive research on dogs and is best known for his experiments in classical conditioning. As we discussed briefly in the previous section, classical conditioning is a process by which we learn to associate stimuli and, consequently, to anticipate events.



Ivan Pavlov's research on the digestive system of dogs unexpectedly led to his discovery of the learning process now known as classical conditioning.

Pavlov came to his conclusions about how learning occurs completely by accident. Pavlov was a physiologist, not a psychologist. Physiologists study the life processes of organisms, from the molecular level to the level of cells, organ systems, and entire organisms. Pavlov's area of interest was the digestive system (Hunt, 2007). In his studies with dogs, Pavlov surgically implanted tubes inside dogs' cheeks to collect saliva. He then measured the amount of saliva produced in response to various foods. Over time, Pavlov (1927) observed that the dogs began to salivate not only at the taste of food, but also at the sight of food, at the sight of an empty food bowl, and even at the sound of the laboratory assistants' footsteps. Salivating to food in the mouth is reflexive, so no learning is involved. However, dogs don't naturally salivate at the sight of an empty bowl or the sound of footsteps.

These unusual responses intrigued Pavlov, and he wondered what accounted for what he called the dogs' "psychic secretions" (Pavlov, 1927). To explore this phenomenon in an objective manner, Pavlov designed a series of carefully controlled experiments to see which stimuli would cause the dogs to salivate. He was able to train the dogs to salivate in response to stimuli that clearly had nothing to do with food, such as the sound of a bell, a light, and a touch on the leg. Through his experiments, Pavlov realized that an organism has two types of responses to its environment: (1) unconditioned (unlearned) responses, or reflexes, and (2) conditioned (learned) responses.

In Pavlov's experiments, the dogs salivated each time meat powder was presented to them. The meat powder in this situation was an unconditioned stimulus (UCS): a stimulus that elicits a reflexive response in an

organism. The dogs' salivation was an unconditioned response (UCR): a natural (unlearned) reaction to a given stimulus. Before conditioning, think of the dogs' stimulus and response like this:

Meat powder (UCS) → Salivation (UCR)

In classical conditioning, a neutral stimulus is presented immediately before an unconditioned stimulus. Pavlov would sound a tone (like ringing a bell) and then give the dogs the meat powder. The tone was the neutral stimulus (NS), which is a stimulus that does not naturally elicit a response. Prior to conditioning, the dogs did not salivate when they just heard the tone because the tone had no association for the dogs. Quite simply this pairing means:

Tone (NS) + Meat Powder (UCS) → Salivation (UCR)

When Pavlov paired the tone with the meat powder over and over again, the previously neutral stimulus (the tone) also began to elicit salivation from the dogs. Thus, the neutral stimulus became the conditioned stimulus (CS), which is a stimulus that elicits a response after repeatedly being paired with an unconditioned stimulus. Eventually, the dogs began to salivate to the tone alone, just as they previously had salivated at the sound of the assistants' footsteps. The behavior caused by the conditioned stimulus is called the conditioned response (CR). In the case of Pavlov's dogs, they had learned to associate the tone (CS) with being fed, and they began to salivate (CR) in anticipation of food.

Before Conditioning**During Conditioning****After Conditioning**

Before conditioning, an unconditioned stimulus (food) produces an unconditioned response (salivation), and a neutral stimulus (bell) does not produce a response. During conditioning, the unconditioned stimulus (food) is presented repeatedly just after the presentation of the neutral stimulus (bell). After conditioning, the neutral stimulus alone produces a conditioned response (salivation), thus becoming a conditioned stimulus.

View this video to learn more about Pavlov and his dogs: [Classical Conditioning – Ivan Pavlov](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=694#oembed-1>

General Processes in Classical Conditioning

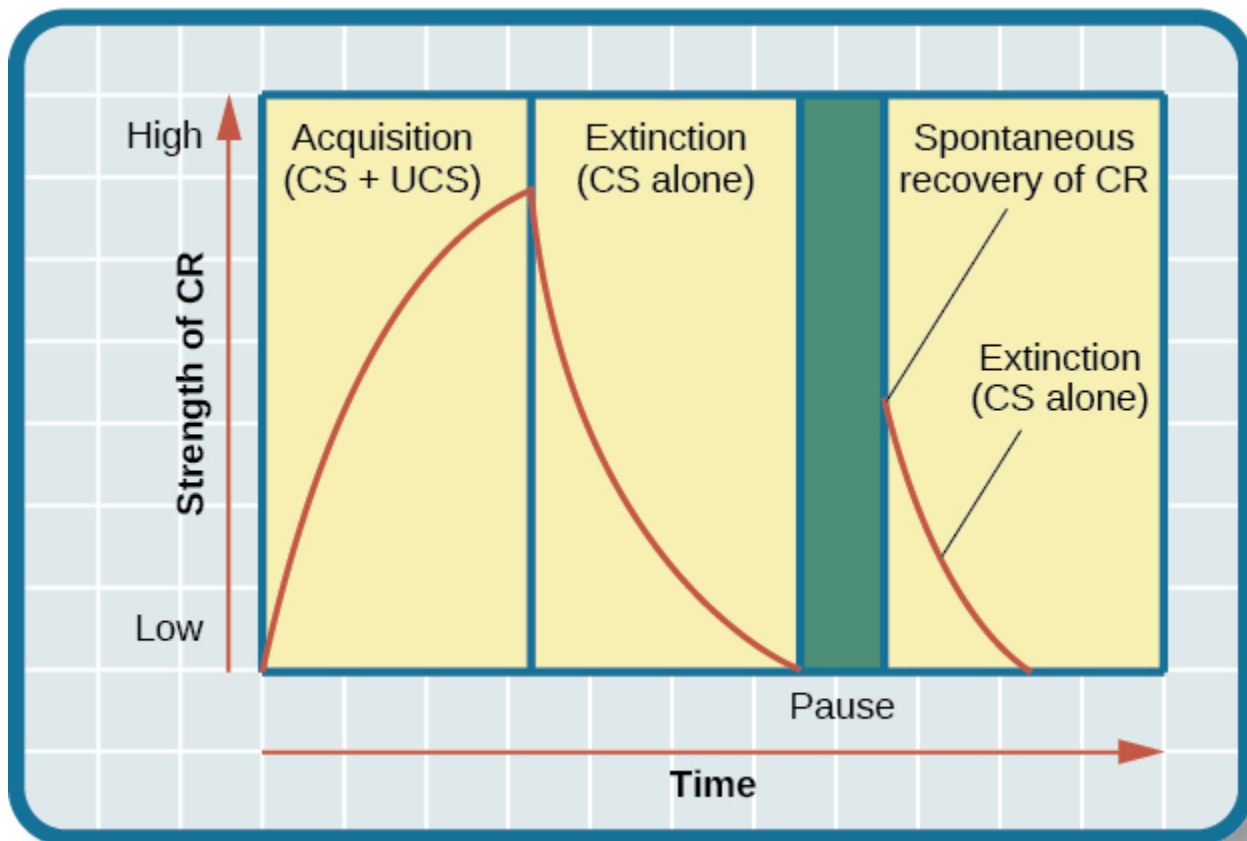
Now that you know how classical conditioning works and have seen several examples, let's take a look at some of the general processes involved. In classical conditioning, the initial period of learning is known as acquisition, when an organism learns to connect a neutral stimulus and an unconditioned stimulus. During acquisition, the neutral stimulus begins to elicit the conditioned response, and eventually the neutral stimulus becomes a conditioned stimulus capable of eliciting the conditioned response by itself. Timing is important for conditioning to occur. Typically, there should only be a brief interval between the presentation of the conditioned stimulus and the unconditioned stimulus. Depending on what is being conditioned, sometimes this interval is as little as five seconds (Chance, 2009). However, with other types of conditioning, the interval can be up to several hours.

Taste aversion is a type of conditioning in which an interval of several hours may pass between the conditioned stimulus (something ingested) and the unconditioned stimulus (nausea or illness). Here's how it works. Between classes, you and a friend grab a quick lunch from a food cart on campus. You share a dish of chicken curry and head off to your next class. A few hours later, you feel nauseous and become ill. Although your friend is fine and you determine that you have intestinal flu (the food is not the culprit), you've developed a taste aversion; the next time you are at a restaurant and someone orders curry, you immediately feel ill. While the chicken dish is not what made you sick, you are experiencing taste aversion: you've been conditioned to be averse to a food after a single, negative experience.

How does this occur—conditioning based on a single instance and involving an extended time lapse between the event and the negative stimulus? Research into taste aversion suggests that this response may be an evolutionary adaptation designed to help organisms quickly learn to avoid harmful foods (Garcia & Rusiniak, 1980; Garcia & Koelling, 1966). Not only may this contribute to species survival via natural selection, but it may also help us develop strategies for challenges such as helping cancer patients through the nausea induced by certain treatments (Holmes, 1993; Jacobsen et al., 1993; Hutton, Baracos, & Wismer, 2007; Skolin et al., 2006).

Once we have established the connection between the unconditioned stimulus and the conditioned stimulus, how do we break that connection and get the dog, cat, or child to stop responding? In Tiger's case, imagine what would happen if you stopped using the electric can opener for her food and began to use it only for human food. Now, Tiger would hear the can opener, but she would not get food. In classical conditioning terms, you would be giving the conditioned stimulus, but not the unconditioned stimulus. Pavlov explored this scenario in his experiments with dogs: sounding the tone without giving the dogs the meat powder. Soon the dogs stopped responding to the tone. Extinction is the decrease in the conditioned response when the unconditioned stimulus is no longer presented with the conditioned stimulus. When presented with the conditioned stimulus alone, the dog, cat, or other organism would show a weaker and weaker response, and finally no response. In classical conditioning terms, there is a gradual weakening and disappearance of the conditioned response.

What happens when learning is not used for a while—when what was learned lies dormant? As we just discussed, Pavlov found that when he repeatedly presented the bell (conditioned stimulus) without the meat powder (unconditioned stimulus), extinction occurred; the dogs stopped salivating to the bell. However, after a couple of hours of resting from this extinction training, the dogs again began to salivate when Pavlov rang the bell. What do you think would happen with Tiger’s behavior if your electric can opener broke, and you did not use it for several months? When you finally got it fixed and started using it to open Tiger’s food again, Tiger would remember the association between the can opener and her food—she would get excited and run to the kitchen when she heard the sound. The behavior of Pavlov’s dogs and Tiger illustrates a concept Pavlov called spontaneous recovery: the return of a previously extinguished conditioned response following a rest period.



This is the curve of acquisition, extinction, and spontaneous recovery. The rising curve shows the conditioned response quickly getting stronger through the repeated pairing of the conditioned stimulus and the unconditioned stimulus (acquisition). Then the curve decreases, which shows how the conditioned response weakens when only the conditioned stimulus is presented (extinction). After a break or pause from conditioning, the conditioned response reappears (spontaneous recovery).

Of course, these processes also apply to humans. For example, let’s say that every day when you walk to campus, an ice cream truck passes your route. Day after day, you hear the truck’s music (neutral stimulus), so you finally stop and purchase a chocolate ice cream bar. You take a bite (unconditioned stimulus) and then your

mouth waters (unconditioned response). This initial period of learning is known as acquisition, when you begin to connect the neutral stimulus (the sound of the truck) and the unconditioned stimulus (the taste of the chocolate ice cream in your mouth). During acquisition, the conditioned response gets stronger and stronger through repeated pairings of the conditioned stimulus and unconditioned stimulus. Several days (and ice cream bars) later, you notice that your mouth begins to water (conditioned response) as soon as you hear the truck's musical jingle—even before you bite into the ice cream bar. Then one day you head down the street. You hear the truck's music (conditioned stimulus), and your mouth waters (conditioned response). However, when you get to the truck, you discover that they are all out of ice cream. You leave disappointed. The next few days you pass by the truck and hear the music, but don't stop to get an ice cream bar because you're running late for class. You begin to salivate less and less when you hear the music, until by the end of the week, your mouth no longer waters when you hear the tune. This illustrates extinction. The conditioned response weakens when only the conditioned stimulus (the sound of the truck) is presented, without being followed by the unconditioned stimulus (chocolate ice cream in the mouth). Then the weekend comes. You don't have to go to class, so you don't pass the truck. Monday morning arrives and you take your usual route to campus. You round the corner and hear the truck again. What do you think happens? Your mouth begins to water again. Why? After a break from conditioning, the conditioned response reappears, which indicates spontaneous recovery.

Acquisition and extinction involve the strengthening and weakening, respectively, of a learned association. Two other learning processes—stimulus discrimination and stimulus generalization—are involved in distinguishing which stimuli will trigger the learned association. Animals (including humans) need to distinguish between stimuli—for example, between sounds that predict a threatening event and sounds that do not—so that they can respond appropriately (such as running away if the sound is threatening). When an organism learns to respond differently to various stimuli that are similar, it is called stimulus discrimination. In classical conditioning terms, the organism demonstrates the conditioned response only to the conditioned stimulus. Pavlov's dogs discriminated between the basic tone that sounded before they were fed and other tones (e.g., the doorbell), because the other sounds did not predict the arrival of food. Similarly, Tiger, the cat, discriminated between the sound of the can opener and the sound of the electric mixer. When the electric mixer is going, Tiger is not about to be fed, so she does not come running to the kitchen looking for food.

On the other hand, when an organism demonstrates the conditioned response to stimuli that are similar to the condition stimulus, it is called stimulus generalization, the opposite of stimulus discrimination. The more similar a stimulus is to the condition stimulus, the more likely the organism is to give the conditioned response. For instance, if the electric mixer sounds very similar to the electric can opener, Tiger may come running after hearing its sound. But if you do not feed her following the electric mixer sound, and you continue to feed her consistently after the electric can opener sound, she will quickly learn to discriminate between the two sounds (provided they are sufficiently dissimilar that she can tell them apart).

Sometimes, classical conditioning can lead to habituation. Habituation occurs when we learn not to respond to a stimulus that is presented repeatedly without change. As the stimulus occurs over and over, we

learn not to focus our attention on it. For example, imagine that your neighbor or roommate constantly has the television blaring. This background noise is distracting and makes it difficult for you to focus when you're studying. However, over time, you become accustomed to the stimulus of the television noise, and eventually you hardly notice it any longer.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=694#h5p-174>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=694#h5p-176>

Critical Thinking Questions

If the sound of your toaster popping up toast causes your mouth to water, what are the UCS, CS, and CR?

The food being toasted is the UCS; the sound of the toaster popping up is the CS; salivating to the sound of the toaster is the CR.

Explain how the processes of stimulus generalization and stimulus discrimination are considered opposites.

In stimulus generalization, an organism responds to new stimuli that are similar to the original conditioned stimulus. For example, a dog barks when the doorbell rings. He then barks when the oven timer dings because it sounds very similar to the doorbell. On the other hand, stimulus discrimination occurs when an organism learns a response to a specific stimulus, but does not respond the same way to new stimuli that are similar. In this case, the dog would bark when he hears the doorbell, but he would not bark when he hears the oven timer ding because they sound different; the dog is able to distinguish between the two sounds.

How does a neutral stimulus become a conditioned stimulus?

This occurs through the process of acquisition. A human or an animal learns to connect a neutral stimulus and an unconditioned stimulus. During the acquisition phase, the neutral stimulus begins to elicit the conditioned response. The neutral stimulus is becoming the conditioned stimulus. At the end of the acquisition phase, learning has occurred and the neutral stimulus becomes a conditioned stimulus capable of eliciting the conditioned response by itself.

Personal Application Question

Can you think of an example in your life of how classical conditioning has produced a positive emotional response, such as happiness or excitement? How about a negative emotional response, such as fear, anxiety, or anger?

Summary

Pavlov's pioneering work with dogs contributed greatly to what we know about learning. His experiments explored the type of associative learning we now call classical conditioning. In classical conditioning, organisms learn to associate events that repeatedly happen together, and researchers study how a reflexive response to a stimulus can be mapped to a different stimulus—by training an association between the two stimuli. Pavlov's experiments show how stimulus-response bonds are formed. Watson, the founder of behaviorism, was greatly influenced by Pavlov's work. He tested humans by conditioning fear in an infant known as Little Albert. His findings suggest that classical conditioning can explain how some fears develop.

34.

OPERANT CONDITIONING

Learning Objectives

By the end of this section, you will be able to:

- Define operant conditioning
- Explain the difference between reinforcement and punishment
- Distinguish between reinforcement schedules

The previous section of this chapter focused on the type of associative learning known as classical conditioning. Remember that in classical conditioning, something in the environment triggers a reflex automatically, and researchers train the organism to react to a different stimulus. Now we turn to the second type of associative learning, operant conditioning. In operant conditioning, organisms learn to associate a behavior with its consequence. A pleasant consequence makes that behavior more likely to be repeated in the future. For example, Spirit, a dolphin at the National Aquarium in Baltimore, does a flip in the air when her trainer blows a whistle. The consequence is that she gets a fish.

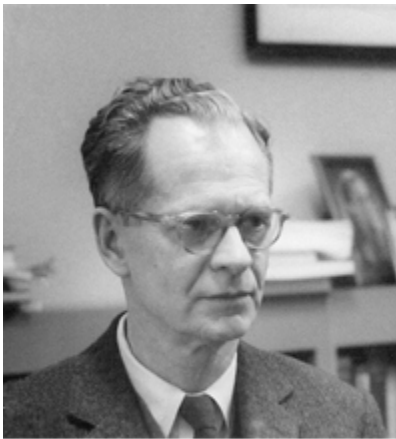
Classical and Operant Conditioning Compared

	Classical Conditioning	Operant Conditioning
Conditioning approach	An unconditioned stimulus (such as food) is paired with a neutral stimulus (such as a bell). The neutral stimulus eventually becomes the conditioned stimulus, which brings about the conditioned response (salivation).	The target behavior is followed by reinforcement or punishment to either strengthen or weaken it, so that the learner is more likely to exhibit the desired behavior in the future.
Stimulus timing	The stimulus occurs immediately before the response.	The stimulus (either reinforcement or punishment) occurs soon after the response.

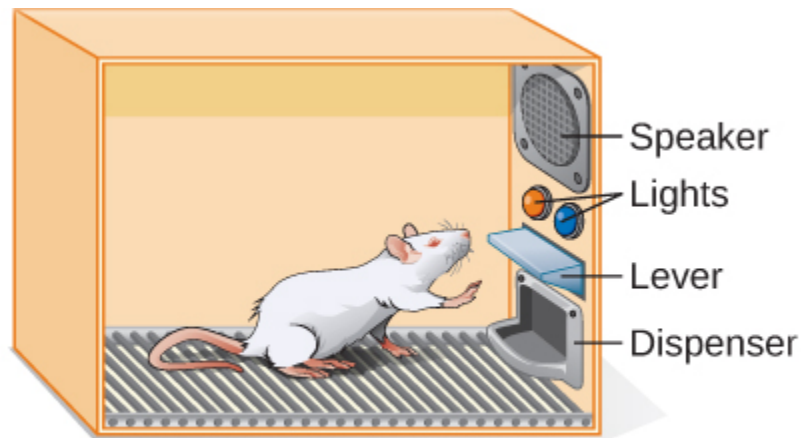
Psychologist B. F. Skinner saw that classical conditioning is limited to existing behaviors that are reflexively

elicited, and it doesn't account for new behaviors such as riding a bike. He proposed a theory about how such behaviors come about. Skinner believed that behavior is motivated by the consequences we receive for the behavior: the reinforcements and punishments. His idea that learning is the result of consequences is based on the law of effect, which was first proposed by psychologist Edward Thorndike. According to the law of effect, behaviors that are followed by consequences that are satisfying to the organism are more likely to be repeated, and behaviors that are followed by unpleasant consequences are less likely to be repeated (Thorndike, 1911). Essentially, if an organism does something that brings about a desired result, the organism is more likely to do it again. If an organism does something that does not bring about a desired result, the organism is less likely to do it again. An example of the law of effect is in employment. One of the reasons (and often the main reason) we show up for work is because we get paid to do so. If we stop getting paid, we will likely stop showing up—even if we love our job.

Working with Thorndike's law of effect as his foundation, Skinner began conducting scientific experiments on animals (mainly rats and pigeons) to determine how organisms learn through operant conditioning (Skinner, 1938). He placed these animals inside an operant conditioning chamber, which has come to be known as a "Skinner box." A Skinner box contains a lever (for rats) or disk (for pigeons) that the animal can press or peck for a food reward via the dispenser. Speakers and lights can be associated with certain behaviors. A recorder counts the number of responses made by the animal.



(a)



(b)

(a) B. F. Skinner developed operant conditioning for systematic study of how behaviors are strengthened or weakened according to their consequences. (b) In a Skinner box, a rat presses a lever in an operant conditioning chamber to receive a food reward. (credit a: modification of work by "Silly rabbit"/Wikimedia Commons)

In discussing operant conditioning, we use several everyday words—positive, negative, reinforcement, and punishment—in a specialized manner. In operant conditioning, positive and negative do not mean good and bad. Instead, *positive* means you are adding something, and *negative* means you are taking something away. *Reinforcement* means you are increasing a behavior, and *punishment* means you are decreasing a behavior.

Reinforcement can be positive or negative, and punishment can also be positive or negative. All reinforcers (positive or negative) *increase* the likelihood of a behavioral response. All punishers (positive or negative) *decrease* the likelihood of a behavioral response. Now let’s combine these four terms: positive reinforcement, negative reinforcement, positive punishment, and negative punishment.

Positive and Negative Reinforcement and Punishment		
	Reinforcement	Punishment
Positive	Something is <i>added</i> to <i>increase</i> the likelihood of a behavior.	Something is <i>added</i> to <i>decrease</i> the likelihood of a behavior.
Negative	Something is <i>removed</i> to <i>increase</i> the likelihood of a behavior.	Something is <i>removed</i> to <i>decrease</i> the likelihood of a behavior.

Reinforcement

The most effective way to teach a person or animal a new behavior is with positive reinforcement. In positive reinforcement, a desirable stimulus is added to increase a behavior.

For example, you tell your five-year-old son, Jerome, that if he cleans his room, he will get a toy. Jerome quickly cleans his room because he wants a new art set. Let’s pause for a moment. Some people might say, “Why should I reward my child for doing what is expected?” But in fact we are constantly and consistently rewarded in our lives. Our paychecks are rewards, as are high grades and acceptance into our preferred school. Being praised for doing a good job and for passing a driver’s test is also a reward. Positive reinforcement as a learning tool is extremely effective. It has been found that one of the most effective ways to increase achievement in school districts with below-average reading scores was to pay the children to read. Specifically, second-grade students in Dallas were paid two dollars each time they read a book and passed a short quiz about the book. The result was a significant increase in reading comprehension (Fryer, 2010). What do you think about this program? If Skinner were alive today, he would probably think this was a great idea. He was a strong proponent of using operant conditioning principles to influence students’ behavior at school. In fact, in addition to the Skinner box, he also invented what he called a teaching machine that was designed to reward small steps in learning (Skinner, 1961)—an early forerunner of computer-assisted learning. His teaching machine tested students’ knowledge as they worked through various school subjects. If students answered questions correctly, they received immediate positive reinforcement and could continue; if they answered incorrectly, they did not receive any reinforcement. The idea was that students would spend additional time studying the material to increase their chance of being reinforced the next time (Skinner, 1961).

In negative reinforcement, an undesirable stimulus is removed to increase a behavior. For example, car manufacturers use the principles of negative reinforcement in their seatbelt systems, which go “beep, beep, beep” until you fasten your seatbelt. The annoying sound stops when you exhibit the desired behavior, increasing the likelihood that you will buckle up in the future. Negative reinforcement is also used frequently

in horse training. Riders apply pressure—by pulling the reins or squeezing their legs—and then remove the pressure when the horse performs the desired behavior, such as turning or speeding up. The pressure is the negative stimulus that the horse wants to remove.

Punishment

Many people confuse negative reinforcement with punishment in operant conditioning, but they are two very different mechanisms. Remember that reinforcement, even when it is negative, always increases a behavior. In contrast, punishment always decreases a behavior. In positive punishment, you add an undesirable stimulus to decrease a behavior. An example of positive punishment is scolding a student to get the student to stop texting in class. In this case, a stimulus (the reprimand) is added in order to decrease the behavior (texting in class). In negative punishment, you remove an aversive stimulus to decrease behavior. For example, when a child misbehaves, a parent can take away a favorite toy. In this case, a stimulus (the toy) is removed in order to decrease the behavior.

Punishment, especially when it is immediate, is one way to decrease undesirable behavior. For example, imagine your four-year-old son, Brandon, hit his younger brother. You have Brandon write one hundred times “I will not hit my brother” (positive punishment). Chances are he won’t repeat this behavior. While strategies like this are common today, in the past children were often subject to physical punishment, such as spanking. It’s important to be aware of some of the drawbacks of using physical punishment on children. First, punishment may teach fear. Brandon may become fearful of the street, but he also may become fearful of the person who delivered the punishment—you, his parent. Similarly, children who are punished by teachers may come to fear the teacher and try to avoid school (Gershoff et al., 2010). Consequently, most schools in the United States have banned corporal punishment. Second, punishment may cause children to become more aggressive and prone to antisocial behavior and delinquency (Gershoff, 2002). They see their parents resort to spanking when they become angry and frustrated, so, in turn, they may act out this same behavior when they become angry and frustrated. For example, because you spank Brenda when you are angry with her for her misbehavior, she might start hitting her friends when they won’t share their toys.

While positive punishment can be effective in some cases, Skinner suggested that the use of punishment should be weighed against the possible negative effects. Today’s psychologists and parenting experts favor reinforcement over punishment—they recommend that you catch your child doing something good and reward her for it.

Shaping

In his operant conditioning experiments, Skinner often used an approach called shaping. Instead of rewarding only the target behavior, in shaping, we reward successive approximations of a target behavior. Why is shaping

needed? Remember that in order for reinforcement to work, the organism must first display the behavior. Shaping is needed because it is extremely unlikely that an organism will display anything but the simplest of behaviors spontaneously. In shaping, behaviors are broken down into many small, achievable steps. The specific steps used in the process are the following:

Reinforce any response that resembles the desired behavior.

Then reinforce the response that more closely resembles the desired behavior. You will no longer reinforce the previously reinforced response.

Next, begin to reinforce the response that even more closely resembles the desired behavior.

Continue to reinforce closer and closer approximations of the desired behavior.

Finally, only reinforce the desired behavior.

Shaping is often used in teaching a complex behavior or chain of behaviors. Skinner used shaping to teach pigeons not only such relatively simple behaviors as pecking a disk in a Skinner box, but also many unusual and entertaining behaviors, such as turning in circles, walking in figure eights, and even playing ping pong; the technique is commonly used by animal trainers today. An important part of shaping is stimulus discrimination. Recall Pavlov's dogs—he trained them to respond to the tone of a bell, and not to similar tones or sounds. This discrimination is also important in operant conditioning and in shaping behavior.

Here is a brief video of Skinner's pigeons playing ping pong: [BF Skinner Foundation – Pigeon Ping Pong Clip](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=696#oembed-1>

It's easy to see how shaping is effective in teaching behaviors to animals, but how does shaping work with humans? Let's consider parents whose goal is to have their child learn to clean his room. They use shaping to help him master steps toward the goal. Instead of performing the entire task, they set up these steps and reinforce each step. First, he cleans up one toy. Second, he cleans up five toys. Third, he chooses whether to pick up ten toys or put his books and clothes away. Fourth, he cleans up everything except two toys. Finally, he cleans his entire room.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=696#h5p-178>

Primary and Secondary Reinforcers

Rewards such as stickers, praise, money, toys, and more can be used to reinforce learning. Let's go back to Skinner's rats again. How did the rats learn to press the lever in the Skinner box? They were rewarded with food each time they pressed the lever. For animals, food would be an obvious reinforcer.

What would be a good reinforcer for humans? For your daughter Sydney, it was the promise of a toy if she cleaned her room. How about Joaquin, the soccer player? If you gave Joaquin a piece of candy every time he made a goal, you would be using a primary reinforcer. Primary reinforcers are reinforcers that have innate reinforcing qualities. These kinds of reinforcers are not learned. Water, food, sleep, shelter, sex, and touch, among others, are primary reinforcers. Pleasure is also a primary reinforcer. Organisms do not lose their drive for these things. For most people, jumping in a cool lake on a very hot day would be reinforcing and the cool lake would be innately reinforcing—the water would cool the person off (a physical need), as well as provide pleasure.

A secondary reinforcer has no inherent value and only has reinforcing qualities when linked with a primary reinforcer. Praise, linked to affection, is one example of a secondary reinforcer, as when you called out "Great shot!" every time Joaquin made a goal. Another example, money, is only worth something when you can use it to buy other things—either things that satisfy basic needs (food, water, shelter—all primary reinforcers) or other secondary reinforcers. If you were on a remote island in the middle of the Pacific Ocean and you had stacks of money, the money would not be useful if you could not spend it. What about the stickers on the behavior chart? They also are secondary reinforcers.

Sometimes, instead of stickers on a sticker chart, a token is used. Tokens, which are also secondary reinforcers, can then be traded in for rewards and prizes. Entire behavior management systems, known as token economies, are built around the use of these kinds of token reinforcers. Token economies have been found to be very effective at modifying behavior in a variety of settings such as schools, prisons, and mental hospitals.

For example, a study by Cangi and Daly (2013) found that the use of a token economy increased appropriate social behaviors and reduced inappropriate behaviors in a group of autistic schoolchildren. Autistic children tend to exhibit disruptive behaviors such as pinching and hitting. When the children in the study exhibited appropriate behavior (not hitting or pinching), they received a “quiet hands” token. When they hit or pinched, they lost a token. The children could then exchange specified amounts of tokens for minutes of playtime.

Behavior Modification in Children

Parents and teachers often use behavior modification to change a child’s behavior. Behavior modification uses the principles of operant conditioning to accomplish behavior change so that undesirable behaviors are switched for more socially acceptable ones. Some teachers and parents create a sticker chart, in which several behaviors are listed. Sticker charts are a form of token economies, as described in the text. Each time children perform the behavior, they get a sticker, and after a certain number of stickers, they get a prize, or reinforcer. The goal is to increase acceptable behaviors and decrease misbehavior. Remember, it is best to reinforce desired behaviors, rather than to use punishment. In the classroom, the teacher can reinforce a wide range of behaviors, from students raising their hands, to walking quietly in the hall, to turning in their homework. At home, parents might create a behavior chart that rewards children for things such as putting away toys, brushing their teeth, and helping with dinner. In order for behavior modification to be effective, the reinforcement needs to be connected with the behavior; the reinforcement must matter to the child and be done consistently.



Sticker charts are a form of positive reinforcement and a tool for behavior modification. Once this little girl earns a certain number of stickers for demonstrating a desired behavior, she will be rewarded with a trip to the ice cream parlor. (credit: Abigail Batchelder)

Time-out is another popular technique used in behavior modification with children. It operates on the principle of negative punishment. When a child demonstrates an undesirable behavior, she is removed from the desirable activity at hand. For example, say that Sophia and her brother Mario are playing with building blocks. Sophia throws some blocks at her brother, so you give her a warning that she will go to time-out if she does it again. A few minutes later, she throws more blocks at Mario. You remove Sophia from the room for a few minutes. When she comes back, she doesn't throw blocks.

There are several important points that you should know if you plan to implement time-out as a behavior modification technique. First, make sure the child is being removed from a desirable activity and placed in a less desirable location. If the activity is something undesirable for the child, this technique will backfire because it is more enjoyable for the child to be removed from the activity. Second, the length of the time-out is important. The general rule of thumb is one minute for each year of the child's age. Sophia is five; therefore, she sits in a time-out for five minutes. Setting a timer helps children know how long they have to sit in time-out. Finally, as a caregiver, keep several guidelines in mind over the course of a time-out: remain calm when directing your child to time-out; ignore your child during time-out (because caregiver attention may reinforce misbehavior); and give the child a hug or a kind word when time-out is over.



(a)



(b)

Time-out is a popular form of negative punishment used by caregivers. When a child misbehaves, he or she is removed from a desirable activity in an effort to decrease the unwanted behavior. For example, (a) a child might be playing on the playground with friends and push another child; (b) the child who misbehaved would then be removed from the activity for a short period of time. (credit a: modification of work by Simone Ramella; credit b: modification of work by "JefferyTurner"/Flickr)

Reinforcement Schedules

Remember, the best way to teach a person or animal a behavior is to use positive reinforcement. For example, Skinner used positive reinforcement to teach rats to press a lever in a Skinner box. At first, the rat might randomly hit the lever while exploring the box, and out would come a pellet of food. After eating the pellet, what do you think the hungry rat did next? It hit the lever again, and received another pellet of food. Each time

the rat hit the lever, a pellet of food came out. When an organism receives a reinforcer each time it displays a behavior, it is called continuous reinforcement. This reinforcement schedule is the quickest way to teach someone a behavior, and it is especially effective in training a new behavior. Let's look back at the dog that was learning to sit earlier in the chapter. Now, each time he sits, you give him a treat. Timing is important here: you will be most successful if you present the reinforcer immediately after he sits, so that he can make an association between the target behavior (sitting) and the consequence (getting a treat).

Watch this video clip where veterinarian Dr. Sophia Yin shapes a dog's behavior using the steps outlined above: [Free Shaping with an Australian CattleDog | drsophiayin.com](https://www.youtube.com/watch?v=696#oembed-2).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=696#oembed-2>

Once a behavior is trained, researchers and trainers often turn to another type of reinforcement schedule—partial reinforcement. In partial reinforcement, also referred to as intermittent reinforcement, the person or animal does not get reinforced every time they perform the desired behavior. There are several different types of partial reinforcement schedules. These schedules are described as either fixed or variable, and as either interval or ratio. *Fixed* refers to the number of responses between reinforcements, or the amount of time between reinforcements, which is set and unchanging. *Variable* refers to the number of responses or amount of time between reinforcements, which varies or changes. *Interval* means the schedule is based on the time between reinforcements, and *ratio* means the schedule is based on the number of responses between reinforcements.

Reinforcement Schedules

Reinforcement Schedule	Description	Result	Example
Fixed interval	Reinforcement is delivered at predictable time intervals (e.g., after 5, 10, 15, and 20 minutes).	Moderate response rate with significant pauses after reinforcement	Hospital patient uses patient-controlled, doctor-timed pain relief
Variable interval	Reinforcement is delivered at unpredictable time intervals (e.g., after 5, 7, 10, and 20 minutes).	Moderate yet steady response rate	Checking Facebook
Fixed ratio	Reinforcement is delivered after a predictable number of responses (e.g., after 2, 4, 6, and 8 responses).	High response rate with pauses after reinforcement	Piecework—factory worker getting paid for every x number of items manufactured
Variable ratio	Reinforcement is delivered after an unpredictable number of responses (e.g., after 1, 4, 5, and 9 responses).	High and steady response rate	Gambling

Now let's combine these four terms. A fixed interval reinforcement schedule is when behavior is rewarded after a set amount of time. For example, June undergoes major surgery in a hospital. During recovery, she is expected to experience pain and will require prescription medications for pain relief. June is given an IV drip with a patient-controlled painkiller. Her doctor sets a limit: one dose per hour. June pushes a button when pain becomes difficult, and she receives a dose of medication. Since the reward (pain relief) only occurs on a fixed interval, there is no point in exhibiting the behavior when it will not be rewarded.

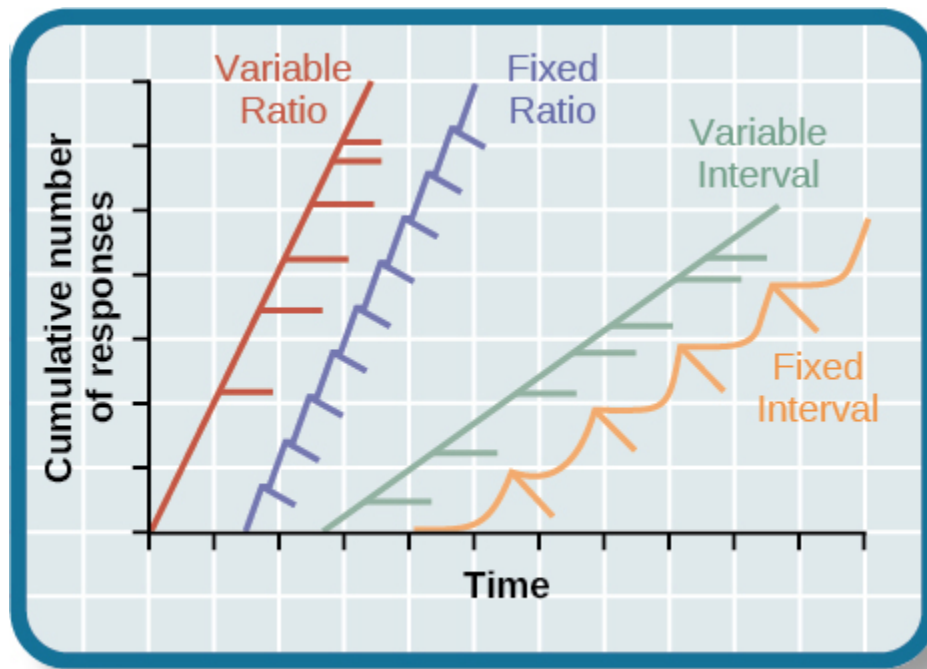
With a variable interval reinforcement schedule, the person or animal gets the reinforcement based on varying amounts of time, which are unpredictable. Say that Manuel is the manager at a fast-food restaurant. Every once in a while someone from the quality control division comes to Manuel's restaurant. If the restaurant is clean and the service is fast, everyone on that shift earns a \$20 bonus. Manuel never knows when the quality control person will show up, so he always tries to keep the restaurant clean and ensures that his employees provide prompt and courteous service. His productivity regarding prompt service and keeping a clean restaurant is steady because he wants his crew to earn the bonus.

With a fixed ratio reinforcement schedule, there are a set number of responses that must occur before the behavior is rewarded. Carla sells glasses at an eyeglass store, and she earns a commission every time she sells a pair of glasses. She always tries to sell people more pairs of glasses, including prescription sunglasses or a backup pair, so she can increase her commission. She does not care if the person really needs the prescription sunglasses, Carla just wants her bonus. The quality of what Carla sells does not matter because her commission is not based on quality; it's only based on the number of pairs sold. This distinction in the quality of performance can help determine which reinforcement method is most appropriate for a particular situation. Fixed ratios are better suited to optimize the quantity of output, whereas a fixed interval, in which the reward is not quantity-based, can lead to a higher quality of output.

In a variable ratio reinforcement schedule, the number of responses needed for a reward varies. This is

the most powerful partial reinforcement schedule. An example of the variable ratio reinforcement schedule is gambling. Imagine that Sarah—generally a smart, thrifty woman—visits Las Vegas for the first time. She is not a gambler, but out of curiosity she puts a quarter into the slot machine, and then another, and another. Nothing happens. Two dollars in quarters later, her curiosity is fading, and she is just about to quit. But then, the machine lights up, bells go off, and Sarah gets 50 quarters back. That’s more like it! Sarah gets back to inserting quarters with renewed interest, and a few minutes later she has used up all her gains and is \$10 in the hole. Now might be a sensible time to quit. And yet, she keeps putting money into the slot machine because she never knows when the next reinforcement is coming. She keeps thinking that with the next quarter she could win \$50, or \$100, or even more. Because the reinforcement schedule in most types of gambling has a variable ratio schedule, people keep trying and hoping that the next time they will win big. This is one of the reasons that gambling is so addictive—and so resistant to extinction.

In operant conditioning, the extinction of a reinforced behavior occurs at some point after reinforcement stops, and the speed at which this happens depends on the reinforcement schedule. In a variable ratio schedule, the point of extinction comes very slowly, as described above. But in the other reinforcement schedules, extinction may come quickly. For example, if June presses the button for the pain relief medication before the allotted time her doctor has approved, no medication is administered. She is on a fixed interval reinforcement schedule (dosed hourly), so extinction occurs quickly when reinforcement doesn’t come at the expected time. Among the reinforcement schedules, variable ratio is the most productive and the most resistant to extinction. Fixed interval is the least productive and the easiest to extinguish.



The four reinforcement schedules yield different response patterns. The variable ratio schedule is unpredictable and yields high and steady response rates, with little if any pause after reinforcement (e.g., gambler). A fixed ratio schedule is predictable and produces a high response rate, with a short pause after reinforcement (e.g., eyeglass saleswoman). The variable interval schedule is unpredictable and produces a moderate, steady response rate (e.g., restaurant manager). The fixed interval schedule yields a scallop-shaped response pattern, reflecting a significant pause after reinforcement (e.g., surgery patient).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=696#h5p-179>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=696#h5p-180>

Critical Thinking Questions

What is a Skinner box and what is its purpose?

A Skinner box is an operant conditioning chamber used to train animals such as rats and pigeons to perform certain behaviors, like pressing a lever. When the animals perform the desired behavior, they receive a reward: food or water.

What is the difference between negative reinforcement and punishment?

In negative reinforcement you are taking away an undesirable stimulus in order to increase the frequency of a certain behavior (e.g., buckling your seat belt stops the annoying beeping sound in your car and increases the likelihood that you will wear your seatbelt). Punishment is designed to reduce a behavior (e.g., you scold your child for running into the street in order to decrease the unsafe behavior.)

What is shaping and how would you use shaping to teach a dog to roll over?

Shaping is an operant conditioning method in which you reward closer and closer approximations of the desired behavior. If you want to teach your dog to roll over, you might reward him first when he sits, then when he lies down, and then when he lies down and rolls onto his back. Finally, you would reward him only when he completes the entire sequence: lying down, rolling onto his back, and then continuing to roll over to his other side.

Personal Application Questions

Explain the difference between negative reinforcement and punishment and provide several examples of each based on your own experiences.

Think of a behavior that you have that you would like to change. How could you use behavior modification, specifically positive reinforcement, to change your behavior? What is your positive reinforcer?

Summary

Operant conditioning is based on the work of B. F. Skinner. Operant conditioning is a form of learning in which the motivation for a behavior happens *after* the behavior is demonstrated. An animal or a human receives a consequence after performing a specific behavior. The consequence is either a reinforcer or a punisher. All reinforcement (positive or negative) *increases* the likelihood of a behavioral response. All punishment (positive or negative) *decreases* the likelihood of a behavioral response. Several types of reinforcement schedules are used to reward behavior depending on either a set or variable period of time.

35.

OBSERVATIONAL LEARNING (MODELING)

Learning Objectives

By the end of this section, you will be able to:

- Define observational learning
- Discuss the steps in the modeling process
- Explain the prosocial and antisocial effects of observational learning

Previous sections of this chapter focused on classical and operant conditioning, which are forms of associative learning. In observational learning, we learn by watching others and then imitating, or modeling, what they do or say. The individuals performing the imitated behavior are called models. Research suggests that this imitative learning involves a specific type of neuron, called a mirror neuron (Hickock, 2010; Rizzolatti, Fadiga, Fogassi, & Gallese, 2002; Rizzolatti, Fogassi, & Gallese, 2006).

Humans and other animals are capable of observational learning. As you will see, the phrase “monkey see, monkey do” really is accurate. The same could be said about other animals. For example, in a study of social learning in chimpanzees, researchers gave juice boxes with straws to two groups of captive chimpanzees. The first group dipped the straw into the juice box, and then sucked on the small amount of juice at the end of the straw. The second group sucked through the straw directly, getting much more juice. When the first group, the “dippers,” observed the second group, “the suckers,” what do you think happened? All of the “dippers” in the first group switched to sucking through the straws directly. By simply observing the other chimps and modeling their behavior, they learned that this was a more efficient method of getting juice (Yamamoto, Humle, and Tanaka, 2013).



This spider monkey learned to drink water from a plastic bottle by seeing the behavior modeled by a human. (credit: U.S. Air Force, Senior Airman Kasey Close)

Imitation is much more obvious in humans, but is imitation really the sincerest form of flattery? Consider Claire's experience with observational learning. Claire's nine-year-old son, Jay, was getting into trouble at school and was defiant at home. Claire feared that Jay would end up like her brothers, two of whom were in prison. One day, after yet another bad day at school and another negative note from the teacher, Claire, at her wit's end, beat her son with a belt to get him to behave. Later that night, as she put her children to bed, Claire witnessed her four-year-old daughter, Anna, take a belt to her teddy bear and whip it. Claire was horrified, realizing that Anna was imitating her mother. It was then that Claire knew she wanted to discipline her children in a different manner.

Like Tolman, whose experiments with rats suggested a cognitive component to learning, psychologist Albert Bandura's ideas about learning were different from those of strict behaviorists. Bandura and other researchers proposed a brand of behaviorism called social learning theory, which took cognitive processes into account. According to Bandura, pure behaviorism could not explain why learning can take place in the absence of external reinforcement. He felt that internal mental states must also have a role in learning and that observational learning involves much more than imitation. In imitation, a person simply copies what the model does. Observational learning is much more complex. According to Lefrançois (2012) there are several ways that observational learning can occur:

- You learn a new response. After watching your coworker get chewed out by your boss for coming in late, you start leaving home 10 minutes earlier so that you won't be late.
- You choose whether or not to imitate the model depending on what you saw happen to the model. Remember Julian and his father? When learning to surf, Julian might watch how his father pops up successfully on his surfboard and then attempt to do the same thing. On the other hand, Julian might

learn not to touch a hot stove after watching his father get burned on a stove.

- You learn a general rule that you can apply to other situations.

Bandura identified three kinds of models: live, verbal, and symbolic. A live model demonstrates a behavior in person, as when Ben stood up on his surfboard so that Julian could see how he did it. A verbal instructional model does not perform the behavior, but instead explains or describes the behavior, as when a soccer coach tells his young players to kick the ball with the side of the foot, not with the toe. A symbolic model can be fictional characters or real people who demonstrate behaviors in books, movies, television shows, video games, or Internet sources.



(a)



(b)

(a) Yoga students learn by observation as their yoga instructor demonstrates the correct stance and movement for her students (live model). (b) Models don't have to be present for learning to occur: through symbolic modeling, this child can learn a behavior by watching someone demonstrate it on television. (credit a: modification of work by Tony Cecala; credit b: modification of work by Andrew Hyde)

Latent learning and modeling are used all the time in the world of marketing and advertising.

[This commercial](#) played for months across the New York, New Jersey, and Connecticut areas.

Derek Jeter, an award-winning baseball player for the New York Yankees, is advertising a Ford:

[Full Derek Jeter Ford commercial](#). The commercial aired in a part of the country where Jeter is an incredibly well-known athlete. He is wealthy and considered very loyal and good-looking. What

message are the advertisers sending by having him featured in the ad? How effective do you think it is?



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=698#oembed-1>

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here: <https://louis.pressbooks.pub/intropsychology/?p=698#h5p-182>

Steps in the Modeling Process

Of course, we don't learn a behavior simply by observing a model. Bandura described specific steps in the process of modeling that must be followed if learning is to be successful: attention, retention, reproduction, and motivation. First, you must be focused on what the model is doing—you have to pay attention. Next, you must be able to retain, or remember, what you observed; this is retention. Then, you must be able to perform the behavior that you observed and committed to memory; this is reproduction. Finally, you must have motivation. You need to want to copy the behavior, and whether or not you are motivated depends on what happened to the model. If you saw that the model was reinforced for her behavior, you will be more motivated to copy her. This is known as vicarious reinforcement. On the other hand, if you observed the model being punished, you would be less motivated to copy her. This is called vicarious punishment. For example,

imagine that four-year-old Allison watched her older sister Kaitlyn playing in their mother's makeup, and then saw Kaitlyn get a time-out when their mother came in. After their mother left the room, Allison was tempted to play in the make-up, but she did not want to get a time-out from her mother. What do you think she did? Once you actually demonstrate the new behavior, the reinforcement you receive plays a part in whether or not you will repeat the behavior.

Bandura researched modeling behavior, particularly children's modeling of adults' aggressive and violent behaviors (Bandura, Ross, & Ross, 1961). He conducted an experiment with a five-foot inflatable doll that he called a Bobo doll. In the experiment, children's aggressive behavior was influenced by whether the teacher was punished for her behavior. In one scenario, a teacher acted aggressively with the doll, hitting, throwing, and even punching the doll, while a child watched. There were two types of responses by the children to the teacher's behavior. When the teacher was punished for her bad behavior, the children decreased their tendency to act as she had. When the teacher was praised or ignored (and not punished for her behavior), the children imitated what she did, and even what she said. They punched, kicked, and yelled at the doll.

Watch this video clip to see a portion of the famous Bobo doll experiment, including an interview with Albert Bandura: [Albert Bandura Bobo Doll experiment.mp4](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=698#oembed-2>

What are the implications of this study? Bandura concluded that we watch and learn, and that this learning can have both prosocial and antisocial effects. Prosocial (positive) models can be used to encourage socially acceptable behavior. Parents in particular should take note of this finding. If you want your children to read, then read to them. Let them see you reading. Keep books in your home. Talk about your favorite books. If you want your children to be healthy, then let them see you eat right and exercise, and spend time engaging in physical fitness activities together. The same holds true for qualities like kindness, courtesy, and honesty. The main idea is that children observe and learn from their parents, even their parents' morals, so be consistent and toss out the old adage "Do as I say, not as I do," because children tend to copy what you do instead of what you say. Besides parents, many public figures, such as Martin Luther King, Jr. and Mahatma Gandhi, are viewed as prosocial models who are able to inspire global social change. Can you think of someone who has been a prosocial model in your life?

The antisocial effects of observational learning are also worth mentioning. As you saw from the example of

Claire at the beginning of this section, her daughter viewed Claire's aggressive behavior and copied it. Research suggests that this may help to explain why abused children often grow up to be abusers themselves (Murrell, Christoff, & Henning, 2007). In fact, about 30% of abused children become abusive parents (U.S. Department of Health & Human Services, 2013). We tend to do what we know. Abused children, who grow up witnessing their parents deal with anger and frustration through violent and aggressive acts, often learn to behave in that manner themselves. Sadly, it's a vicious cycle that's difficult to break.

Some studies suggest that violent television shows, movies, and video games may also have antisocial effects, although further research needs to be done to understand the correlational and causal aspects of media violence and behavior. Some studies have found a link between viewing violence and aggression seen in children (Anderson & Gentile, 2008; Kirsch, 2010; Miller, Grabell, Thomas, Bermann, & Graham-Bermann, 2012). These findings may not be surprising, given that a child graduating from high school has been exposed to around 200,000 violent acts, including murder, robbery, torture, bombings, beatings, and rape through various forms of media (Huston et al., 1992). Not only might viewing media violence affect aggressive behavior by teaching people to act that way in real-life situations, but it has also been suggested that repeated exposure to violent acts also desensitizes people to it. Psychologists are working to understand this dynamic.



Can video games make us violent? Psychological researchers study this topic. (credit: "woodleywonderworks"/Flickr)

View this [video](#) to hear Brad Bushman, a psychologist who has published extensively on human aggression and violence, discuss his research: [Can Violent Video Games Play a Role in Violent Behavior?](#)

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=698#h5p-183>

Critical Thinking Questions

What is the effect of prosocial modeling and antisocial modeling?

Prosocial modeling can prompt others to engage in helpful and healthy behaviors, while antisocial modeling can prompt others to engage in violent, aggressive, and unhealthy behaviors.

Cara is 17 years old. Cara's mother and father both drink alcohol every night. They tell Cara that drinking is bad and she shouldn't do it. Cara goes to a party where beer is being served. What do you think Cara will do? Why?

Cara is more likely to drink at the party because she has observed her parents drinking regularly. Children tend to follow what a parent does rather than what they say.

Personal Application Question

What is something you have learned how to do after watching someone else?

Summary

According to Bandura, learning can occur by watching others and then modeling what they do or say. This is known as observational learning. There are specific steps in the process of modeling that must be followed if learning is to be successful. These steps include attention, retention, reproduction, and motivation. Through modeling, Bandura has shown that children learn many things both good and bad simply by watching their parents, siblings, and others.

36.

USING THE PRINCIPLES OF LEARNING TO UNDERSTAND EVERYDAY BEHAVIOR

Learning Objectives

- Review the ways that learning theories can be applied to understanding and modifying everyday behavior.
- Describe the situations under which reinforcement may make people *less* likely to enjoy engaging in a behavior.
- Explain how principles of reinforcement are used to understand social dilemmas such as the prisoner's dilemma and why people are likely to make competitive choices in them.

The principles of learning are some of the most general and most powerful in all of psychology. It would be fair to say that these principles account for more behavior using fewer principles than any other set of psychological theories. The principles of learning are applied in numerous ways in everyday settings. For example, operant conditioning has been used to motivate employees, to improve athletic performance, to increase the functioning of those suffering from developmental disabilities, and to help parents successfully toilet train their children (Simek & O'Brien, 1981; Pedalino & Gamboa, 1974; Azrin & Foxx, 1974; McGlynn, 1990). In this section we will consider how learning theories are used in advertising, in education, and in understanding competitive relationships between individuals and groups.

USING CLASSICAL CONDITIONING IN

ADVERTISING

Classical conditioning has long been, and continues to be, an effective tool in marketing and advertising (Hawkins, Best, & Coney, 1998). The general idea is to create an advertisement that has positive features such that the ad creates enjoyment in the person exposed to it. The enjoyable ad serves as the unconditioned stimulus (US), and the enjoyment is the unconditioned response (UR). Because the product being advertised is mentioned in the ad, it becomes associated with the US, and then becomes the conditioned stimulus (CS). In the end, if everything has gone well, seeing the product online or in the store will then create a positive response in the buyer, leading him or her to be more likely to purchase the product.

A similar strategy is used by corporations that sponsor teams or events. For instance, if people enjoy watching a college basketball team play basketball, and if that team is sponsored by a product, such as Pepsi, then people may end up experiencing positive feelings when they view a can of Pepsi. Of course, the sponsor wants to sponsor only good teams and good athletes because these create more pleasurable responses.

Advertisers use a variety of techniques to create positive advertisements, including enjoyable music, cute babies, attractive models, and funny spokespeople. In one study, Gorn (1982) showed research participants pictures of different writing pens of different colors, but paired one of the pens with pleasant music and the other with unpleasant music. When given a choice as a free gift, more people chose the pen color associated with the pleasant music. And Schemer, Matthes, Wirth, and Textor (2008) found that people were more interested in products that had been embedded in music videos of artists that they liked and less likely to be interested when the products were in videos featuring artists that they did not like.

Another type of ad that is based on principles of classical conditioning is one that associates fear with the use of a product or behavior, such as those that show pictures of deadly automobile accidents to encourage seatbelt use or images of lung cancer surgery to discourage smoking. These ads have also been found to be effective (Das, de Wit, & Stroebe, 2003; Perloff, 2003; Witte & Allen, 2000), due in large part to conditioning. When we see a cigarette and the fear of dying has been associated with it, we are hopefully less likely to light up.

Taken together then, there is ample evidence of the utility of classical conditioning, using both positive as well as negative stimuli, in advertising. This does not, however, mean that we are always influenced by these ads. The likelihood of conditioning being successful is greater for products that we do not know much about, where the differences between products are relatively minor, and when we do not think too carefully about the choices (Schemer et al., 2008).

PSYCHOLOGY IN EVERYDAY LIFE: OPERANT CONDITIONING IN THE CLASSROOM

John B. Watson and B. F. Skinner believed that all learning was the result of reinforcement, and thus that reinforcement could be used to educate children. For instance, Watson wrote in his book on behaviorism,

Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for many thousands of years (Watson, 1930, p. 82).

Skinner promoted the use of *programmed instruction*, an educational tool that consists of self-teaching with the aid of a specialized textbook or teaching machine that presents material in a logical sequence (Skinner, 1965). Programmed instruction allows students to progress through a unit of study at their own rate, checking their own answers and advancing only after answering correctly. Programmed instruction is used today in many classes, for instance to teach computer programming (Emurian, 2009).

Although reinforcement can be effective in education, and teachers make use of it by awarding gold stars, good grades, and praise, there are also substantial limitations to using rewards to improve learning. To be most effective, rewards must be contingent on appropriate behavior. In some cases teachers may distribute rewards indiscriminately, for instance by giving praise or good grades to children whose work does not warrant it, in the hope that they will “feel good about themselves” and that this self-esteem will lead to better performance. Studies indicate, however, that high self-esteem alone does not improve academic performance (Baumeister, Campbell, Krueger, & Vohs, 2003). When rewards are not earned, they become meaningless and no longer provide motivation for improvement.

Another potential limitation of rewards is that they may teach children that the activity should be performed for the reward, rather than for one's own interest in the task. If rewards are offered too often, the task itself becomes less appealing. Mark Lepper and his colleagues (Lepper, Greene, & Nisbett, 1973) studied this possibility by leading some children to think that they engaged in an activity for a reward, rather than because they simply enjoyed it. First, they placed some fun felt-tipped markers in the classroom of the children they were studying. The children loved the markers and played with them right away. Then, the markers were taken out of the classroom, and the children were given a chance to play with the markers individually at an experimental session with the researcher. At the research session, the children were randomly assigned to one of three experimental groups. One group of children (the *expected reward* condition) was told that if they

played with the markers they would receive a good drawing award. A second group (the *unexpected reward* condition) also played with the markers, and also got the award—but they were not told ahead of time that they would be receiving the award; it came as a surprise after the session. The third group (the *no reward* group) played with the markers too, but got no award.

Then, the researchers placed the markers back in the classroom and observed how much the children in each of the three groups played with them. As you can see in the figure “Undermining Intrinsic Interest,” the children who had been led to expect a reward for playing with the markers during the experimental session played with the markers less at the second session than they had at the first session. The idea is that, when the children had to choose whether or not to play with the markers when the markers reappeared in the classroom, they based their decision on their own prior behavior. The children in the no reward groups and the children in the unexpected reward groups realized that they played with the markers because they liked them. Children in the expected award condition, however, remembered that they were promised a reward for the activity the last time they played with the markers. These children, then, were more likely to draw the inference that they play with the markers only for the external reward, and because they did not expect to get an award for playing with the markers in the classroom, they determined that they didn’t like them. Expecting to receive the award at the session had undermined their initial interest in the markers.

Undermining Intrinsic Interest



Mark Lepper and his colleagues (1973) found that giving rewards for playing with markers, which the children naturally enjoyed, could reduce their interest in the activity.

Adapted from Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality & Social Psychology*, 28(1), 129–137.

This research suggests that, although giving rewards may in many cases lead us to perform an

activity more frequently or with more effort, reward may not always increase our liking for the activity. In some cases reward may actually make us like an activity less than we did before we were rewarded for it. This outcome is particularly likely when the reward is perceived as an obvious attempt on the part of others to get us to do something. When children are given money by their parents to get good grades in school, they may improve their school performance to gain the reward. But at the same time their liking for school may decrease. On the other hand, rewards that are seen as more internal to the activity, such as rewards that praise us, remind us of our achievements in the domain, and make us feel good about ourselves as a result of our accomplishments are more likely to be effective in increasing not only the performance of, but also the liking of, the activity (Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Ryan & Deci, 2002).

Other research findings also support the general principle that punishment is generally less effective than reinforcement in changing behavior. In a recent meta-analysis, Gershoff (2002) found that although children who were spanked by their parents were more likely to immediately comply with the parents' demands, they were also more aggressive, showed less ability to control aggression, and had poorer mental health in the long term than children who were not spanked. The problem seems to be that children who are punished for bad behavior are likely to change their behavior only to avoid the punishment, rather than by internalizing the norms of being good for its own sake. Punishment also tends to generate anger, defiance, and a desire for revenge. Moreover, punishment models the use of aggression and ruptures the important relationship between the teacher and the learner (Kohn, 1993).

REINFORCEMENT IN SOCIAL DILEMMAS

The basic principles of reinforcement, reward, and punishment have been used to help understand a variety of human behaviors (Rotter, 1945; Bandura, 1977; Miller & Dollard, 1941). The general idea is that, as predicted by principles of operant learning and the law of effect, people act in ways that maximize their *outcomes*, where outcomes are defined as the presence of reinforcers and the absence of punishers.

Consider, for example, a situation known as the *commons dilemma*, as proposed by the ecologist Garrett Hardin (1968). Hardin noted that in many European towns there was at one time a centrally located pasture, known as the commons, which was shared by the inhabitants of the village to graze their livestock. But the commons was not always used wisely. The problem was that each individual who owned livestock wanted

to be able to use the commons to graze his or her own animals. However, when each group member took advantage of the commons by grazing many animals, the commons became overgrazed, the pasture died, and the commons was destroyed.

Although Hardin focused on the particular example of the commons, the basic dilemma of individual desires versus the benefit of the group as a whole can also be found in many contemporary public goods issues, including the use of limited natural resources, air pollution, and public land. In large cities most people may prefer the convenience of driving their own car to work each day rather than taking public transportation. Yet this behavior uses up public goods (the space on limited roadways, crude oil reserves, and clean air). People are lured into the dilemma by short-term rewards, seemingly without considering the potential long-term costs of the behavior, such as air pollution and the necessity of building even more highways.

A social dilemma such as the commons dilemma is *a situation in which the behavior that creates the most positive outcomes for the individual may in the long term lead to negative consequences for the group as a whole*. The dilemmas are arranged in a way that it is easy to be selfish, because the personally beneficial choice (such as using water during a water shortage or driving to work alone in one's own car) produces reinforcements for the individual. Furthermore, social dilemmas tend to work on a type of "time delay." The problem is that, because the long-term negative outcome (the extinction of fish species or dramatic changes in the earth's climate) is far away in the future and the individual benefits are occurring right now, it is difficult for an individual to see how many costs there really are. The paradox, of course, is that if everyone makes the personally selfish choice in an attempt to maximize his or her own outcomes, the long-term result is poorer outcomes for every individual in the group. Each individual prefers to make use of the public goods for himself or herself, whereas the best outcome for the group as a whole is to use the resources more slowly and wisely.

One method of understanding how individuals and groups behave in social dilemmas is to create such situations in the laboratory and observe how people react to them. The best known of these laboratory simulations is called the prisoner's dilemma game (Poundstone, 1992). This game *represents a social dilemma in which the goals of the individual compete with the goals of another individual (or sometimes with a group of other individuals)*. Like all social dilemmas, the prisoner's dilemma assumes that individuals will generally try to maximize their own outcomes in their interactions with others.

In the prisoner's dilemma game, the participants are shown a *payoff matrix* in which numbers are used to express the potential outcomes for each of the players in the game, given the decisions each player makes. The payoffs are chosen beforehand by the experimenter to create a situation that models some real-world outcome. Furthermore, in the prisoner's dilemma game, the payoffs are normally arranged as they would be in a typical social dilemma, such that each individual is better off acting in his or her immediate self-interest, and yet if all individuals act according to their self-interests, then everyone will be worse off.

In its original form, the prisoner's dilemma game involves a situation in which two prisoners (we'll call them Frank and Malik) have been accused of committing a crime. The police believe that the two worked together on the crime, but they have only been able to gather enough evidence to convict each of them of a more minor offense. In an attempt to gain more evidence, and thus to be able to convict the prisoners of the larger crime,

each of the prisoners is interrogated individually, with the hope that he will confess to having been involved in the more major crime, in return for a promise of a reduced sentence if he confesses first. Each prisoner can make either the *cooperative choice* (which is to not confess) or the *competitive choice* (which is to confess).

The incentives for either confessing or not confessing are expressed in a payoff matrix such as the one shown in the figure “The Prisoner’s Dilemma.” The top of the matrix represents the two choices that Malik might make (to either confess that he did the crime or not confess), and the side of the matrix represents the two choices that Frank might make (also to either confess or not confess). The payoffs that each prisoner receives, given the choices of each of the two prisoners, are shown in each of the four squares.

The Prisoner’s Dilemma

		Malik	
		Don’t confess	Confess
Frank	Don’t confess	3 3	0 30
	Confess	30 0	10 10
		Sentence in years	

In the prisoner’s dilemma game, two suspected criminals are interrogated separately. The matrix indicates the outcomes for each prisoner, measured as the number of years each is sentenced to prison, as a result of each combination of cooperative (don’t confess) and competitive (confess) decisions. Outcomes for Malik are in black and outcomes for Frank are in gray.

If both prisoners make the cooperative choice by not confessing (the situation represented in the upper left square of the matrix), there will be a trial, the limited available information will be used to convict each

prisoner, and they each will be sentenced to a relatively short prison term of 3 years. However, if either of the prisoners confesses, turning “state’s evidence” against the other prisoner, then there will be enough information to convict the other prisoner of the larger crime, and that prisoner will receive a sentence of 30 years, whereas the prisoner who confesses will get off free. These outcomes are represented in the lower left and upper right squares of the matrix. Finally, it is possible that both players confess at the same time. In this case there is no need for a trial, and in return the prosecutors offer a somewhat reduced sentence (of 10 years) to each of the prisoners.

The prisoner’s dilemma has two interesting characteristics that make it a useful model of a social dilemma. For one, the prisoner’s dilemma is arranged such that a positive outcome for one player does not necessarily mean a negative outcome for the other player. If you consider again the matrix in the figure “The Prisoner’s Dilemma,” you can see that if one player makes the cooperative choice (to not confess) and the other takes the competitive choice (to confess), then the prisoner who cooperates loses, whereas the other prisoner wins. However, if both prisoners make the cooperative choice, each remaining quiet, then neither gains more than the other, and both prisoners receive a relatively light sentence. In this sense both players can win at the same time.

Second, the prisoner’s dilemma matrix is arranged such that each individual player is motivated to make the competitive choice, because this choice leads to a higher payoff regardless of what the other player does. Imagine for a moment that you are Malik, and you are trying to decide whether to cooperate (don’t confess) or to compete (confess). And imagine that you are not really sure what Frank is going to do. Remember the goal of the individual is to maximize outcomes. The values in the matrix make it clear that if you think that Frank is going to confess, you should confess yourself (to get 10 rather than 30 years in prison). And, it is also clear that if you think Frank is not going to confess, you should still confess (to get 0 rather than 3 years in prison). So the matrix is arranged such that the “best” alternative for each player, at least in the sense of pure reward and self-interest, is to make the competitive choice, even though in the end both players would prefer the combination in which both players cooperate to the one in which they both compete.

Although initially specified in terms of the two prisoners, similar payoff matrices can be used to predict behavior in many different types of dilemmas involving two or more parties and including choices of helping and not helping, working and loafing, and paying and not paying debts. For instance, we can use the prisoner’s dilemma to help us understand roommates living together in a house who might not want to contribute to the housework. Each of them would be better off if they relied on the other to clean the house. Yet if neither of them makes an effort to clean the house (the cooperative choice), the house becomes a mess and they will both be worse off.

Summary

Classical conditioning was first studied by physiologist Ivan Pavlov. In classical conditioning a person or animal learns to associate a neutral stimulus (the conditioned stimulus, or CS) with a stimulus (the unconditioned

stimulus, or US) that naturally produces a behavior (the unconditioned response, or UR). As a result of this association, the previously neutral stimulus comes to elicit the same or similar response (the conditioned response, or CR).

Classically conditioned responses show extinction if the CS is repeatedly presented without the US. The CR may reappear later in a process known as spontaneous recovery.

Organisms may show stimulus generalization, in which stimuli similar to the CS may produce similar behaviors, or stimulus discrimination, in which the organism learns to differentiate between the CS and other similar stimuli.

Second-order conditioning occurs when a second CS is conditioned to a previously established CS.

Psychologist Edward Thorndike developed the law of effect: the idea that responses that are reinforced are “stamped in” by experience and thus occur more frequently, whereas responses that are punishing are “stamped out” and subsequently occur less frequently.

B.F. Skinner (1904–1990) expanded on Thorndike’s ideas to develop a set of principles to explain operant conditioning.

Positive reinforcement strengthens a response by presenting something pleasant after the response, and negative reinforcement strengthens a response by reducing or removing something unpleasant. Positive punishment weakens a response by presenting something unpleasant after the response, whereas negative punishment weakens a response by reducing or removing something pleasant.

Shaping is the process of guiding an organism’s behavior to the desired outcome through the use of reinforcers.

Reinforcement may be either partial or continuous. Partial-reinforcement schedules are determined by whether the reward is presented on the basis of the time that elapses between rewards (interval) or on the basis of the number of responses that the organism engages in (ratio), and by whether the reinforcement occurs on a regular (fixed) or unpredictable (variable) schedule.

Not all learning can be explained through the principles of classical and operant conditioning. Insight is the sudden understanding of the components of a problem that makes the solution apparent, and latent learning refers to learning that is not reinforced and not demonstrated until there is motivation to do so.

Learning by observing the behavior of others and the consequences of those behaviors is known as observational learning. Aggression, altruism, and many other behaviors are learned through observation.

Learning theories can and have been applied to change behaviors in many areas of everyday life. Some advertising uses classical conditioning to associate a pleasant response with a product.

Rewards are frequently and effectively used in education but must be carefully designed to be contingent on performance and to avoid undermining interest in the activity.

Social dilemmas, such as the prisoner’s dilemma, can be understood in terms of a desire to maximize one’s outcomes in a competitive relationship.

37.

REFERENCES

- Anderson, C. A., & Gentile, D. A. (2008). Media violence, aggression, and public policy. In E. Borgida & S. Fiske (Eds.), *Beyond common sense: Psychological science in the courtroom* (p. 322). Malden, MA: Blackwell.
- Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology*, 63, 575–582.
- Cangi, K., & Daly, M. (2013). The effects of token economies on the occurrence of appropriate and inappropriate behaviors by children with autism in a social skills setting. *West Chester University: Journal of Undergraduate Research*. Retrieved from http://www.wcupa.edu/UndergraduateResearch/journal/documents/cangi_S2012.pdf
- Carlson, L., Holscher, C., Shipley, T., & Conroy Dalton, R. (2010). Getting lost in buildings. *Current Directions in Psychological Science*, 19(5), 284–289.
- Cialdini, R. B. (2008). *Influence: Science and practice* (5th ed.). Boston, MA: Pearson Education.
- Chance, P. (2009). *Learning and behavior* (6th ed.). Belmont, CA: Wadsworth, Cengage Learning.
- DeAngelis, T. (2010). “Little Albert” regains his identity. *Monitor on Psychology*, 41(1), 10.
- Franzen, H. (2001, May 24). Gambling, like food and drugs, produces feelings of reward in the brain. *Scientific American* [online]. Retrieved from <http://www.scientificamerican.com/article.cfm?id=gamblinglike-food-and-dru>
- Fryer, R. G., Jr. (2010, April). Financial incentives and student achievement: Evidence from randomized trials. *National Bureau of Economic Research [NBER] Working Paper, No. 15898*. Retrieved from <http://www.nber.org/papers/w15898>
- Garcia, J., & Koelling, R. A. (1966). Relation of cue to consequence in avoidance learning. *Psychonomic Science*, 4, 123–124.
- Garcia, J., & Rusiniak, K. W. (1980). What the nose learns from the mouth. In D. Müller-Schwarze & R. M. Silverstein (Eds.), *Chemical signals: Vertebrates and aquatic invertebrates* (pp. 141–156). New York, NY: Plenum Press.
- Gershoff, E. T. (2002). Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychological Bulletin*, 128(4), 539–579. doi:10.1037//0033-2909.128.4.539
- Gershoff, E.T., Grogan-Kaylor, A., Lansford, J. E., Chang, L., Zelli, A., Deater-Deckard, K., & Dodge, K. A. (2010). Parent discipline practices in an international sample: Associations with child behaviors and moderation by perceived normativeness. *Child Development*, 81(2), 487–502.

- Hickock, G. (2010). The role of mirror neurons in speech and language processing. *Brain and Language*, 112, 1–2.
- Holmes, S. (1993). Food avoidance in patients undergoing cancer chemotherapy. *Support Care Cancer*, 1(6), 326–330.
- Hunt, M. (2007). *The story of psychology*. New York, NY: Doubleday.
- Huston, A. C., Donnerstein, E., Fairchild, H., Feshbach, N. D., Katz, P. A., Murray, J. P., . . . Zuckerman, D. (1992). *Big world, small screen: The role of television in American society*. Lincoln, NE: University of Nebraska Press.
- Hutton, J. L., Baracos, V. E., & Wismer, W. V. (2007). Chemosensory dysfunction is a primary factor in the evolution of declining nutritional status and quality of life with patients with advanced cancer. *Journal of Pain Symptom Management*, 33(2), 156–165.
- Illinois Institute for Addiction Recovery. (n.d.). *WTVP on gambling*. Retrieved from <http://www.addictionrecov.org/InTheNews/Gambling/>
- Jacobsen, P. B., Bovbjerg, D. H., Schwartz, M. D., Andrykowski, M. A., Futterman, A. D., Gilewski, T., . . . Redd, W. H. (1993). Formation of food aversions in cancer patients receiving repeated infusions of chemotherapy. *Behaviour Research and Therapy*, 31(8), 739–748.
- Kirsch, S. J. (2010). *Media and youth: A developmental perspective*. Malden MA: Wiley Blackwell.
- Lefrançois, G. R. (2012). *Theories of human learning: What the professors said* (6th ed.). Belmont, CA: Wadsworth, Cengage Learning.
- Miller, L. E., Grabel, A., Thomas, A., Bermann, E., & Graham-Bermann, S. A. (2012). The associations between community violence, television violence, intimate partner violence, parent-child aggression, and aggression in sibling relationships of a sample of preschoolers. *Psychology of Violence*, 2(2), 165–78. doi:10.1037/a0027254
- Murrell, A., Christoff, K. & Henning, K. (2007). Characteristics of domestic violence offenders: associations with childhood exposure to violence. *Journal of Family Violence*, 22(7), 523–532.
- Pavlov, I. P. (1927). *Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex* (G. V. Anrep, Ed. & Trans.). London, UK: Oxford University Press.
- Rizzolatti, G., Fadiga, L., Fogassi, L., & Gallese, V. (2002). From mirror neurons to imitation: Facts and speculations. In A. N. Meltzoff & W. Prinz (Eds.), *The imitative mind: Development, evolution, and brain bases* (pp. 247–66). Cambridge, United Kingdom: Cambridge University Press.
- Rizzolatti, G., Fogassi, L., & Gallese, V. (2006, November). Mirrors in the mind. *Scientific American* [online], pp. 54–61.
- Roy, A., Adinoff, B., Roehrich, L., Lamparski, D., Custer, R., Lorenz, V., . . . Linnoila, M. (1988). Pathological gambling: A psychobiological study. *Archives of General Psychiatry*, 45(4), 369–373. doi:10.1001/archpsyc.1988.01800280085011
- Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. New York, NY: Appleton-Century-Crofts.

- Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Macmillan.
- Skinner, B. F. (1961). *Cumulative record: A selection of papers*. New York, NY: Appleton-Century-Crofts.
- Skinner's utopia: Panacea, or path to hell? (1971, September 20). *Time* [online]. Retrieved from http://www.wou.edu/~girodm/611/Skinner%27s_utopia.pdf
- Skolin, I., Wahlin, Y. B., Broman, D. A., Hursti, U-K. K., Larsson, M. V., & Hernell, O. (2006). Altered food intake and taste perception in children with cancer after start of chemotherapy: Perspectives of children, parents, and nurses. *Supportive Care in Cancer*, 14, 369–78.
- Thorndike, E. L. (1911). Animal intelligence: An experimental study of the associative processes in animals. *Psychological Monographs*, 8.
- Tolman, E. C., & Honzik, C. H. (1930). Degrees of hunger, reward, and non-reward, and maze performance in rats. *University of California Publications in Psychology*, 4, 241–256.
- Tolman, E. C., Ritchie, B. F., & Kalish, D. (1946). Studies in spatial learning: II. Place learning versus response learning. *Journal of Experimental Psychology*, 36, 221–229. doi:10.1037/h0060262
- Watson, J. B. & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology*, 3, 1–14.
- Watson, J. B. (1919). *Psychology from the standpoint of a behaviorist*. Philadelphia, PA: J. B. Lippincott.
- Yamamoto, S., Humle, T., & Tanaka, M. (2013). Basis for cumulative cultural evolution in chimpanzees: Social learning of a more efficient tool-use technique. *PLoS ONE*, 8(1): e55768. doi:10.1371/journal.pone.0055768

PART VIII

THINKING AND INTELLIGENCE



Thinking is an important part of our human experience and one that has captivated people for centuries. Today, it is one area of psychological study. The 19th-century *Girl with a Book* by José Ferraz de Almeida Júnior, the 20th-century sculpture *The Thinker* by Auguste Rodin, and Shi Ke's 10th-century painting *Huike Thinking* all reflect the fascination with the process of human thought. (credit "middle": modification of work by Jason Rogers; credit "right": modification of work by Tang Zu-Ming)

Why is it so difficult to break habits—like reaching for your ringing phone even when you shouldn't, such as when you're driving? How does a person who has never seen or touched snow in real life develop an understanding of the concept of snow? How do young children acquire the ability to learn a language with no formal instruction? Psychologists who study thinking explore questions like these.

Cognitive psychologists also study intelligence. What is intelligence, and how does it vary from person to person? Are "street smarts" a kind of intelligence, and if so, how do they relate to other types of intelligence? What does an IQ test really measure? These questions and more will be explored in this chapter as you study thinking and intelligence.

In other chapters, we discussed the cognitive processes of perception, learning, and memory. In this chapter, we will focus on high-level cognitive processes. As a part of this discussion, we will consider thinking and briefly explore the development and use of language. We will also discuss problem-solving and creativity before ending with a discussion of how intelligence is measured and how our biology and environments interact to affect intelligence. After finishing this chapter, you will have a greater appreciation of the higher-level cognitive processes that contribute to our distinctiveness as a species.

38.

DEFINING AND MEASURING INTELLIGENCE

Learning Objectives

By the end of this section, you will be able to:

- Define the term intelligence
- Explain how intelligence tests are developed
- Describe the history of the use of IQ tests
- Describe the purposes and benefits of intelligence testing

The word “intelligence” continues to escape a true definition, which is agreed upon by all. Two researchers reviewed the literature in an attempt to generate one definition that could receive the approval of the largest number of academicians and scientists. The summation of the work led to a discovery of over seventy separate definitions, which they conceptualized into one defining statement: “*Intelligence measures an agent’s ability to achieve goals in a wide range of environments*” (Legg & Hutter, 2007).

While you’re likely familiar with the term “IQ” and associate it with the idea of intelligence, what does IQ really mean? IQ stands for “intelligence quotient” and describes a score earned on a test designed to measure intelligence. There are many ways psychologists describe intelligence (or more aptly, intelligences). Similarly, IQ tests—the tools designed to measure intelligence—have been the subject of debate throughout their development and use.

When might an IQ test be used? What do we learn from the results, and how might people use this information? IQ tests are expensive to administer and must be given by a licensed psychologist. Intelligence testing has been considered both a bane and a boon for education and social policy. In this section, we will explore what intelligence tests measure, how they are scored, and how they were developed.

Looking at it one way, everyone knows what it [intelligence] means, looking at it another way, no one does.

Robert J. Sternberg, 2000

Measuring Intelligence

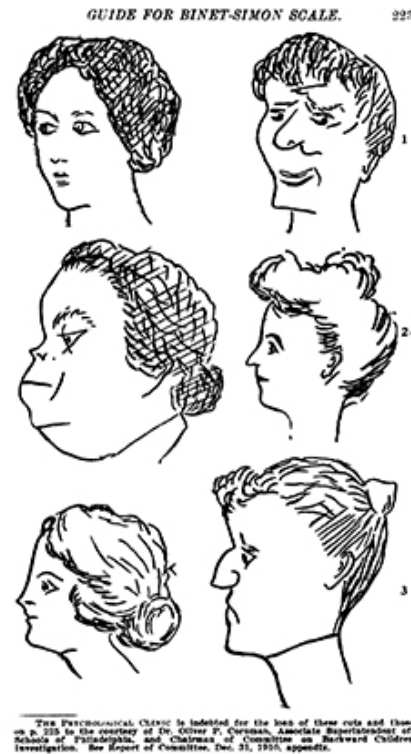
It seems that the human understanding of intelligence is somewhat limited when we focus on traditional or academic-type intelligence. How then, can intelligence be measured? And when we measure intelligence, how do we ensure that we capture what we're really trying to measure (in other words, that IQ tests function as valid measures of intelligence)? In the following paragraphs, we will explore how intelligence tests were developed and the history of their use.

The IQ test has been synonymous with intelligence for over a century. In the late 1800s, Sir Francis Galton developed the first broad test of intelligence (Flanagan & Kaufman, 2004). Although he was not a psychologist, his contributions to the concepts of intelligence testing are still felt today (Gordon, 1995). Reliable intelligence testing (reliability refers to a test's ability to produce consistent results) began in earnest during the early 1900s with a researcher named Alfred Binet. Binet was asked by the French government to develop an intelligence test to use on children to determine which ones might have difficulty in school; it included many verbally based tasks. American researchers soon realized the value of such testing. Louis Terman, a Stanford professor, modified Binet's work by standardizing the administration of the test and tested thousands of different-aged children to establish an average score for each age. As a result, the test was normed and standardized, which means that the test was administered consistently to a large enough representative sample of the population that the range of scores resulted in a bell curve (bell curves will be discussed later).

Standardization means that the manner of administration, scoring, and interpretation of results is consistent. Norming involves giving a test to a large population so data can be collected comparing groups, such as age groups. The resulting data provide norms, or referential scores, by which to interpret future scores. Norms are not expectations of what a given group *should* know but a demonstration of what that group *does* know. Norming and standardizing the test ensures that new scores are reliable. This new version of the test was called the Stanford-Binet Intelligence Scale (Terman, 1916). Remarkably, an updated version of this test is still widely used today.



(a)



(b)

French psychologist Alfred Binet helped to develop intelligence testing. (b) This page is from a 1908 version of the Binet-Simon Intelligence Scale. Children being tested were asked which face, of each pair, was prettier.

In 1939, David Wechsler, a psychologist who spent part of his career working with World War I veterans, developed a new IQ test in the United States. Wechsler combined several subtests from other intelligence tests used between 1880 and World War I. These subtests tapped into a variety of verbal and nonverbal skills because Wechsler believed that intelligence encompassed “the global capacity of a person to act purposefully, to think rationally, and to deal effectively with his environment” (Wechsler, 1958, p. 7). He named the test the Wechsler-Bellevue Intelligence Scale (Wechsler, 1981). This combination of subtests became one of the most extensively used intelligence tests in the history of psychology. Although its name was later changed to the Wechsler Adult Intelligence Scale (WAIS) and it has been revised several times, the aims of the test remain virtually unchanged since its inception (Boake, 2002). Today, there are three intelligence tests credited to Wechsler, the Wechsler Adult Intelligence Scale-fourth edition (WAIS-IV), the Wechsler Intelligence Scale for Children (WISC-V), and the Wechsler Preschool and Primary Scale of Intelligence—IV (WPPSI-IV) (Wechsler, 2012). These tests are used widely in schools and communities throughout the United States, and they are periodically normed and standardized as a means of recalibration. Interestingly, the periodic recalibrations have led to an interesting

observation known as the Flynn effect. Named after James Flynn, who was among the first to describe this trend, the Flynn effect refers to the observation that each generation has a significantly higher IQ than the last. Flynn himself argues, however, that increased IQ scores do not necessarily mean that younger generations are more intelligent per se (Flynn, Shaughnessy, & Fulgham, 2012). As a part of the recalibration process, the WISC-V was given to thousands of children across the country, and children taking the test today are compared with their same-age peers.

The WISC-V is composed of 14 subtests, which comprise five indices, which then render an IQ score. The five indices are Verbal Comprehension, Visual Spatial, Fluid Reasoning, Working Memory, and Processing Speed. When the test is complete, individuals receive a score for each of the five indices and a Full-Scale IQ score. The method of scoring reflects the understanding that intelligence is comprised of multiple abilities in several cognitive realms and focuses on the mental processes that the child used to arrive at his or her answers to each test item.

Ultimately, we are still left with the question of how valid intelligence tests are. Certainly, the most modern versions of these tests tap into more than verbal competencies, yet the specific skills that should be assessed in IQ testing, the degree to which any test can truly measure an individual's intelligence, and the use of the results of IQ tests are still issues of debate (Gresham & Witt, 1997; Flynn, Shaughnessy, & Fulgham, 2012; Richardson, 2002; Schlinger, 2003).

Intellectually Disabled Criminals and Capital Punishment

The case of *Atkins v. Virginia* was a landmark case in the United States Supreme Court. On August 16, 1996, two men, Daryl Atkins and William Jones, robbed, kidnapped, and then shot and killed Eric Nesbitt, a local airman from the U.S. Air Force. A clinical psychologist evaluated Atkins and testified at the trial that Atkins had an IQ of 59. Atkins' IQ score was over two standard deviations (SD) below the mean, which is 100. Each standard deviation in intelligence measurement is 15 points. The psychologist concluded that Atkins was mildly intellectually disabled.

The jury found Atkins guilty, and he was sentenced to death. Atkins and his attorneys appealed to the Supreme Court. In June 2002, the Supreme Court reversed a previous decision and ruled that executions of intellectually disabled criminals are "cruel and unusual punishments" prohibited by the Eighth Amendment. The court wrote in its decision:

Clinical definitions of mental retardation require not only subaverage intellectual functioning, but also significant limitations in adaptive skills. Mentally retarded persons frequently know the difference between right and wrong and are competent to stand trial. Because of their impairments, however, by definition they have diminished

capacities to understand and process information, to communicate, to abstract from mistakes and learn from experience, to engage in logical reasoning, to control impulses, and to understand others' reactions. Their deficiencies do not warrant an exemption from criminal sanctions, but diminish their personal culpability (*Atkins v. Virginia*, 2002, par. 5).

The court also decided that there was a state legislature consensus against the execution of the intellectually disabled and that this consensus should stand for all of the states. The Supreme Court ruling left it up to the states to determine their own definitions of mental retardation and intellectual disability. The definitions vary among states as to who can be executed. In the *Atkins* case, a jury decided that because he had many contacts with his lawyers and thus was provided with intellectual stimulation, his IQ had reportedly increased, and he was now smart enough to be executed. He was given an execution date and then received a stay of execution after it was revealed that lawyers for the co-defendant, William Jones, coached Jones to “produce a testimony against Mr. Atkins that did match the evidence” (Liptak, 2008). After the revelation of this misconduct, Atkins was re-sentenced to life imprisonment.

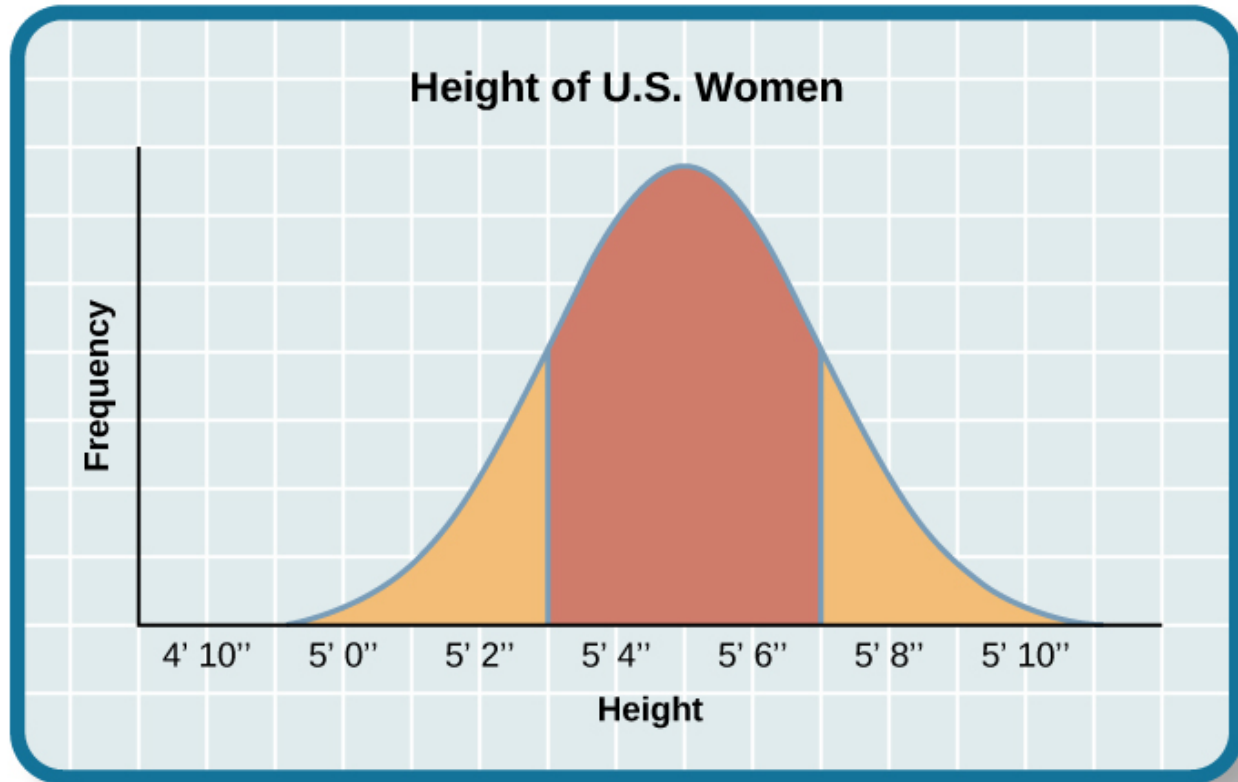
Atkins v. Virginia (2002) highlights several issues regarding society's beliefs around intelligence. In the *Atkins* case, the Supreme Court decided that intellectual disability *does* affect decision making and therefore should affect the nature of the punishment such criminals receive. Where, however, should the lines of intellectual disability be drawn? In May 2014, the Supreme Court ruled in a related case (*Hall v. Florida*) that IQ scores cannot be used as a final determination of a prisoner's eligibility for the death penalty (Roberts, 2014).

The Bell Curve

The results of intelligence tests follow the bell curve, a graph in the general shape of a bell. When the bell curve is used in psychological testing, the graph demonstrates a normal distribution of a trait, in this case, intelligence, in the human population. Many human traits naturally follow the bell curve. For example, if you lined up all your female schoolmates according to height, it is likely that a large cluster of them would be the average height for an American woman: 5'4"–5'6". This cluster would fall in the center of the bell curve, representing the average height for American women. There would be fewer women who stand closer to 4'11". The same would be true for women of above-average height: those who stand closer to 5'11". The trick to finding a bell curve in nature is to use a large sample size. Without a large sample size, it is less likely that the bell curve will represent the wider population.

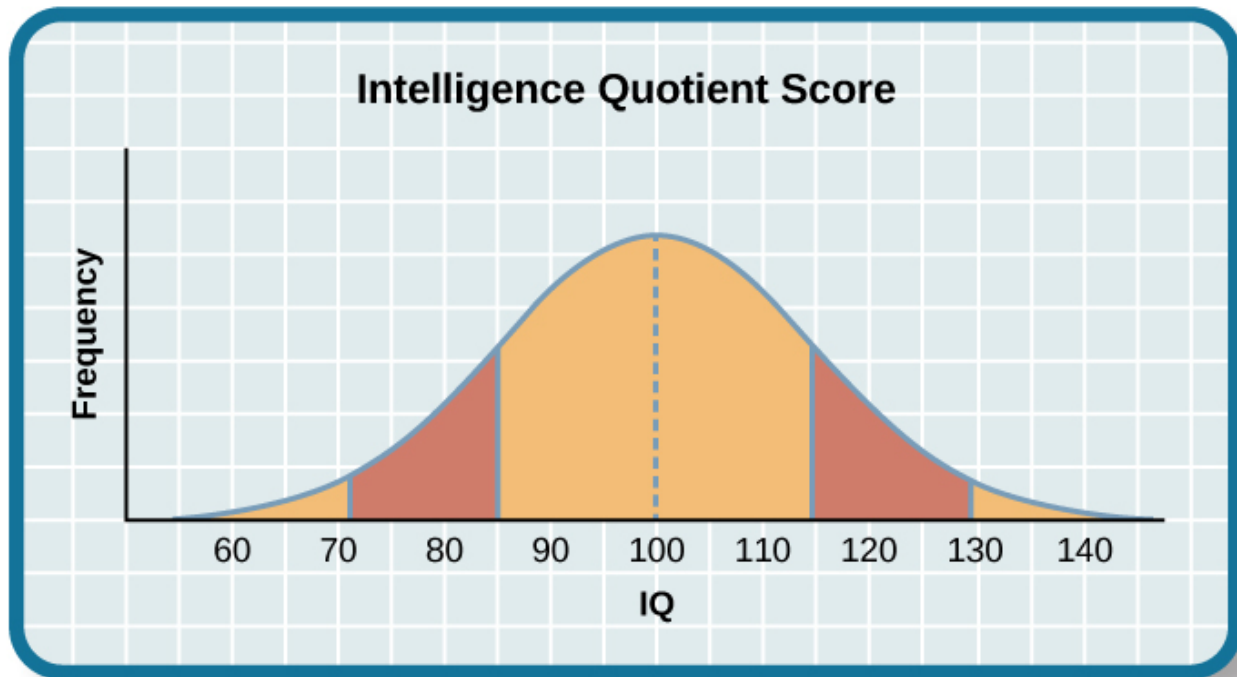
A representative sample is a subset of the population that accurately represents the general population. If, for example, you measured the height of the women in your classroom only, you might not actually have a

representative sample. Perhaps the women's basketball team wanted to take this course together, and they are all in your class. Because basketball players tend to be taller than average, the women in your class may not be a good representative sample of the population of American women. But if your sample included all the women at your school, it is likely that their heights would form a natural bell curve.



Are you of below-average, average, or above-average height?

The same principles apply to intelligence test scores. Individuals earn a score called an intelligence quotient (IQ). Over the years, different types of IQ tests have evolved, but the way scores are interpreted remains the same. The average IQ score on an IQ test is 100. Standard deviations describe how data are dispersed in a population and give context to large data sets. The bell curve uses the standard deviation to show how all scores are dispersed from the average score. In modern IQ testing, one standard deviation is 15 points. So a score of 85 would be described as “one standard deviation below the mean.” How would you describe a score of 115 and a score of 70? Any IQ score that falls within one standard deviation above and below the mean (between 85 and 115) is considered average, and 68% of the population has IQ scores in this range. An IQ score of 130 or above is considered a superior level.



The majority of people have an IQ score between 85 and 115.

Only 2.2% of the population has an IQ score below 70 (American Psychological Association [APA], 2013). A score of 70 or below indicates significant cognitive delays, major deficits in adaptive functioning, and difficulty meeting “community standards of personal independence and social responsibility” when compared to same-aged peers (APA, 2013, p. 37). An individual in this IQ range would be considered to have an intellectual disability and exhibit deficits in intellectual functioning and adaptive behavior (American Association on Intellectual and Developmental Disabilities, 2013). Formerly known as mental retardation, the accepted term now is intellectual disability, and it has four subtypes: mild, moderate, severe, and profound. Early to mid-twentieth-century medical terminology delineating the severity of intellectual disability included the terms idiotic, moronic, and imbecilic.

The Diagnostic and Statistical Manual of Psychological Disorders lists criteria for each subgroup (APA, 2013).

Characteristics of Cognitive Disorders

Intellectual Disability Subtype	Percentage of Intellectually Disabled Population	Description
Mild	85%	3rd- to 6th-grade skill level in reading, writing, and math; may be employed and live independently
Moderate	10%	Basic reading and writing skills; functional self-care skills; requires some oversight
Severe	5%	Functional self-care skills; requires oversight of daily environment and activities
Profound	<1%	May be able to communicate verbally or nonverbally; requires intensive oversight

On the other end of the intelligence spectrum are those individuals whose IQs fall into the highest ranges. Consistent with the bell curve, about 2% of the population falls into this category. People are considered gifted if they have an IQ score of 130 or higher, or superior intelligence in a particular area. Long ago, popular belief suggested that people of high intelligence were maladjusted. This idea was disproven through a groundbreaking study of gifted children. In 1921, Lewis Terman began a longitudinal study of over 1,500 children with IQs over 135 (Terman, 1925). His findings showed that these children became well-educated, successful adults who were, in fact, well-adjusted (Terman & Oden, 1947). Additionally, Terman’s study showed that the subjects were above average in physical build and attractiveness, dispelling an earlier popular notion that highly intelligent people were “weaklings.” Some people with very high IQs elect to join Mensa, an organization dedicated to identifying, researching, and fostering intelligence. Members must have an IQ score in the top 2% of the population, and they may be required to pass other exams in their application to join the group.

What's in a Name? Mental Retardation

In the past, individuals with IQ scores below 70 and significant adaptive and social functioning delays were diagnosed with mental retardation. When this diagnosis was first named, the title held no social stigma. In time, however, the degrading word “retard” sprang from this diagnostic term. “Retard” was frequently used as a taunt, especially among young people, until the words “mentally retarded” and “retard” became an insult. As such, the DSM-5 now labels this diagnosis as “intellectual disability.” Many states once had a Department of Mental Retardation to serve those diagnosed with such cognitive delays, but most have changed their name to the Department of Developmental Disabilities or something similar in language. The Social Security Administration still uses the term “mental retardation” but is considering eliminating it from its programming (Goad, 2013).

Do you think changing the title of this department has any impact on how people regard those with

developmental disabilities? Does a different name give people more dignity, and if so, how? Does it change the expectations for those with developmental or cognitive disabilities? Why or why not?

Why Measure Intelligence?

The value of IQ testing is most evident in educational or clinical settings. Children who seem to be experiencing learning difficulties or severe behavioral problems can be tested to ascertain whether the child's difficulties can be partly attributed to an IQ score that is significantly different from the mean for the child's age group. Without IQ testing—or another measure of intelligence—children and adults needing extra support might not be identified effectively. In addition, IQ testing is used in courts to determine whether a defendant has special or extenuating circumstances that preclude the accused from participating in some way in a trial. People also use IQ testing results to seek disability benefits from the Social Security Administration. While IQ tests have sometimes been used as arguments in support of insidious purposes, such as the eugenics movement (Severson, 2011), the following case study demonstrates the usefulness and benefits of IQ testing.

Candace, a 14-year-old girl experiencing problems at school, was referred for a court-ordered psychological evaluation. She was in regular education classes in ninth grade and was failing every subject. Candace had never been a stellar student but had always been passed to the next grade. Frequently, she would curse at any of her teachers who called on her in class. She also got into fights with other students and occasionally shoplifted. When she arrived for the evaluation, Candace immediately said that she hated everything about school, including the teachers, the rest of the staff, the building, and the homework. Her parents stated that they felt their daughter was picked on because she was of a different race than the teachers and most of the other students. When asked why she cursed at her teachers, Candace replied, “They only call on me when I don’t know the answer. I don’t want to say, ‘I don’t know all of the time and look like an idiot in front of my friends. The teachers embarrass me.’” She was given a battery of tests, including an IQ test. Her score on the IQ test was 68. What does Candace’s score say about her ability to excel or even succeed in regular education classes without assistance?

Summary

In this section, we learned about the definition of intelligence, the history of intelligence testing, and some of the challenges regarding intelligence testing. Intelligence tests began in earnest with Binet; Wechsler later developed intelligence tests that are still in use today: the WAIS-IV and WISC-V. The Bell curve shows the range of scores that encompass average intelligence as well as standard deviations.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=397#h5p-135>

Critical Thinking Questions

Why do you think different theorists have defined intelligence in different ways? Since cognitive processes are complex, ascertaining them in a measurable way is challenging. Researchers have taken different approaches to defining intelligence in an attempt to comprehensively describe and measure it.

Compare and contrast the benefits of the Stanford-Binet IQ test and Wechsler's IQ tests. The Wechsler-Bellevue IQ test combined a series of subtests that tested verbal and nonverbal skills into a single IQ test in order to get a reliable, descriptive score of intelligence. While the Stanford-Binet test was normed and standardized, it focused more on verbal skills than variations in other cognitive processes.

Personal Application Question

In thinking about the case of Candace described earlier, do you think that Candace benefited or suffered as a result of consistently being passed on to the next grade?

39.

LANGUAGE

Learning Objectives

By the end of this section, you will be able to:

- Define language and demonstrate familiarity with the components of language
- Understand how the use of language develops
- Explain the relationship between language and thinking

Language is a communication system that involves using words and systematic rules to organize those words to transmit information from one individual to another. While language is a form of communication, not all communication is language. Many species communicate with one another through their postures, movements, odors, or vocalizations. This communication is crucial for species that need to interact and develop social relationships with their conspecifics, members of the same species. However, many people have asserted that it is language that makes humans unique among all of the animal species (Corballis & Suddendorf, 2007; Tomasello & Rakoczy, 2003). This section will focus on what distinguishes language as a special form of communication, how the use of language develops, and how language affects the way we think.

Components of Language

Language, be it spoken, signed, or written, has specific components: a lexicon and grammar. Lexicon refers to the words of a given language. Thus, the lexicon is a language's vocabulary. Grammar refers to the set of rules that are used to convey meaning through the use of the lexicon (Fernández & Cairns, 2011). For instance, English grammar dictates that most verbs receive an “-ed” at the end to indicate past tense.

Words are formed by combining the various phonemes that make up the language. A phoneme (e.g., the sounds “ah” vs. “eh”) is a basic sound unit of a given language, and different languages have different sets of

phonemes. Phonemes are combined to form morphemes, which are the smallest units of language that convey some type of meaning (e.g., “I” is both a phoneme and a morpheme). We use semantics and syntax to construct language. Semantics and syntax are part of a language’s grammar. Semantics refers to the process by which we derive meaning from morphemes and words. Syntax refers to the way words are organized into sentences (Chomsky, 1965; Fernández & Cairns, 2011).

We apply the rules of grammar to organize the lexicon in novel and creative ways, which allow us to communicate information about both concrete and abstract concepts. We can talk about our immediate and observable surroundings as well as the surface of unseen planets. We can share our innermost thoughts, and our plans for the future, and debate the value of a college education. We can provide detailed instructions for cooking a meal, fixing a car, or building a fire. The flexibility that language provides to relay vastly different types of information is a property that makes language so distinct as a mode of communication among humans.

Language Development

Given the remarkable complexity of a language, one might expect that mastering a language would be an especially arduous task; indeed, for those of us trying to learn a second language as adults, this might seem to be true. However, young children master language very quickly and with relative ease. B. F. Skinner (1957) proposed that language is learned through reinforcement. Noam Chomsky (1965) criticized this behaviorist approach, asserting instead that the mechanisms underlying language acquisition are biologically determined. Chomsky argued that humans have an innate language acquisition device (LAD), genetic imprinting within children. The use of language develops in the absence of formal instruction and appears to follow a very similar pattern in children from vastly different cultures and backgrounds. It would seem, therefore, that we are born with a biological predisposition to acquire a language (Chomsky, 1965; Fernández & Cairns, 2011). Moreover, it appears that there is a critical period for language acquisition, such that this proficiency at acquiring language is maximal early in life; generally, as people age, the ease with which they acquire and master new languages diminishes (Johnson & Newport, 1989; Lenneberg, 1967; Singleton, 1995).

Children begin to learn about language from a very early age. In fact, it appears that this is occurring even before we are born. Newborns show a preference for their mother’s voice and appear to be able to discriminate between the language spoken by their mother and other languages. Babies are also attuned to the languages being used around them and show preferences for videos of faces that are moving in synchrony with the audio of spoken language versus videos that do not synchronize with the audio (Blossom & Morgan, 2006; Pickens, 1994; Spelke & Cortelou, 1981).

Stages of Language and Communication Development

Stage	Age	Developmental Language and Communication
1	0–3 months	Reflexive communication
2	3–8 months	Reflexive communication; interest in others
3	8–13 months	Intentional communication; sociability
4	12–18 months	First words
5	18–24 months	Simple sentences of two words
6	2–3 years	Sentences of three or more words
7	3–5 years	Complex sentences; has conversations

THE CASE OF GENIE

In the fall of 1970, a social worker in the Los Angeles area found a 13-year-old girl who was being raised in extremely neglectful and abusive conditions. The girl, who came to be known as Genie, had lived most of her life tied to a potty chair or confined to a crib in a small room that was kept closed with the curtains drawn. For a little over a decade, Genie had virtually no social interaction and no access to the outside world. As a result of these conditions, Genie was unable to stand up, chew solid food, or speak (Fromkin, Krashen, Curtiss, Rigler, & Rigler, 1974; Rymer, 1993). The police took Genie into protective custody.

Genie's abilities improved dramatically following her removal from her abusive environment, and early on, it appeared she was acquiring language—much later than would be predicted by critical period hypotheses that had been posited at the time (Fromkin et al., 1974). Genie managed to amass an impressive vocabulary in a relatively short amount of time. However, she never developed a mastery of the grammatical aspects of language (Curtiss, 1981). Perhaps being deprived of the opportunity to learn a language during a critical period impeded Genie's ability to fully acquire and use language.

You may recall that each language has its own set of phonemes that are used to generate morphemes, words, and so on. Babies can discriminate among the sounds that make up a language (for example, they can tell the difference between the “s” in vision and the “ss” in fission). Early on, children can differentiate between the sounds of all human languages, even those that do not occur in the languages that are used in their environments. However, by the time they are about 1 year old, they can only discriminate among those

phonemes that are used in the language or languages in their environments (Jensen, 2011; Werker & Lalonde, 1988; Werker & Tees, 1984).

View this video to learn more about how babies lose the ability to discriminate among all possible human phonemes as they age: [Infant Speech Discrimination](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=391#oembed-1>

After the first few months of life, babies enter what is known as the babbling stage, during which time they tend to produce single syllables that are repeated over and over. As time passes, more variations appear in the syllables that they produce. During this time, it is unlikely that the babies are trying to communicate; they are just as likely to babble when they are alone as when they are with their caregivers (Fernández & Cairns, 2011). Interestingly, babies who are raised in environments in which sign language is used will also begin to show babbling in the gestures of their hands during this stage (Petitto, Holowka, Sergio, Levy, & Ostry, 2004).

Generally, a child's first word is uttered sometime between the ages of 1 year to 18 months, and for the next few months, the child will remain in the "one word" stage of language development. During this time, children know a number of words, but they only produce one-word utterances. The child's early vocabulary is limited to familiar objects or events, often nouns. Although children in this stage only make one-word utterances, these words often carry a larger meaning, known as the holophrastic stage (Fernández & Cairns, 2011). So, for example, a child saying "cookie" could be identifying a cookie or asking for a cookie.

As a child's lexicon grows, she begins to utter simple sentences and acquire new vocabulary at a very rapid pace. In addition, children begin to demonstrate a clear understanding of the specific rules that apply to their language(s). Even the mistakes that children sometimes make provide evidence of just how much they understand those rules. This is sometimes seen in the form of overgeneralization. In this context, overgeneralization refers to an extension of a language rule to an exception to the rule. For example, in English, it is usually the case that an "s" is added to the end of a word to indicate plurality. For example, we speak of one dog versus two dogs. Young children will overgeneralize this rule to cases that are exceptions to the "add an s to the end of the word" rule and say things like "those two geese" or "three mouses." Clearly, the rules of the language are understood, even if the exceptions to the rules are still being learned (Moskowitz, 1978).

Language and Thought

When we speak one language, we agree that words are representations of ideas, people, places, and events. The given language that children learn is connected to their culture and surroundings. But can words themselves shape the way we think about things? Psychologists have long investigated the question of whether language shapes thoughts and actions, or whether our thoughts and beliefs shape our language. Two researchers, Edward Sapir and Benjamin Lee Whorf began this investigation in the 1940s. They wanted to understand how the language habits of a community encourage members of that community to interpret language in a particular manner (Sapir, 1941/1964). Sapir and Whorf proposed that language determines thought, suggesting, for example, that a person whose community language did not have past-tense verbs would be challenged to think about the past (Whorf, 1956). Researchers have since identified this view as too absolute, pointing out a lack of empiricism behind what Sapir and Whorf proposed (Abler, 2013; Boroditsky, 2011; van Troyer, 1994). Today, psychologists continue to study and debate the relationship between language and thought.

The Meaning of Language

Think about what you know of other languages; perhaps you even speak multiple languages. Imagine for a moment that your closest friend fluently speaks more than one language. Do you think that friend thinks differently, depending on which language is being spoken? You may know a few words that are not translatable from their original language into English. For example, the Portuguese word *saudade* originated during the 15th century, when Portuguese sailors left home to explore the seas and travel to Africa or Asia. Those left behind described the emptiness and fondness they felt as *saudade*. The word came to express many meanings, including loss, nostalgia, yearning, warm memories, and hope. There is no single word in English that includes all of those emotions in a single description. Do words such as *saudade* indicate that different languages produce different patterns of thought in people? What do you think?



(a)



(b)

These two works of art depict *saudade*. (a) *Saudade de Nápoles*, which is translated into “missing Naples,” was painted by Bertha Worms in 1895. (b) Almeida Júnior painted *Saudade* in 1899.

Language may indeed influence the way that we think, an idea known as linguistic determinism (Fontana et al., 2018). One recent demonstration of this phenomenon involved differences in the way that English and Mandarin Chinese speakers talk and think about time. English speakers tend to talk about time using terms that describe changes along a horizontal dimension, for example, saying something like “I’m running behind schedule” or “Don’t get ahead of yourself.” While Mandarin Chinese speakers also describe time in horizontal terms, it is not uncommon to also use terms associated with a vertical arrangement. For example, the past might be described as being “up” and the future as being “down.” It turns out that these differences in language translate into differences in performance on cognitive tests designed to measure how quickly an individual can recognize temporal relationships. Specifically, when given a series of tasks with vertical priming, Mandarin Chinese speakers were faster at recognizing temporal relationships between months. Indeed, Boroditsky (2001) sees these results as suggesting that “habits in language encourage habits in thought” (p. 12).

One group of researchers wanted to investigate how language influences thought compared to how English speakers and the Dani people of Papua New Guinea think and speak about color. The Dani have two words

for color: one word for *light* and one word for *dark*. In contrast, the English language has eleven color words. Researchers hypothesized that the number of color terms could limit the ways that the Dani people conceptualized color. However, Dani was able to distinguish colors with the same ability as English speakers, despite having fewer words at their disposal (Berlin & Kay, 1969). A recent review of research aimed at determining how language might affect something like color perception suggests that language can influence perceptual phenomena, especially in the left hemisphere of the brain. You may recall from earlier chapters that the left hemisphere is associated with language for most people. However, the right (less linguistic hemisphere) of the brain is less affected by linguistic influences on perception (Regier & Kay, 2009)

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=391#h5p-126>

Summary

Language is a communication system that has both a lexicon and a system of grammar. Language acquisition occurs naturally and effortlessly during the early stages of life, and this acquisition occurs in a predictable sequence for individuals around the world. Language has a strong influence on thought, and the concept of how language may influence cognition remains an area of study and debate in psychology.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=391#h5p-127>

Critical Thinking Questions

How do words not only represent our thoughts but also represent our values?
People tend to talk about the things that are important to them or the things they think about the most. What we talk about, therefore, is a reflection of our values.

How could grammatical errors actually be indicative of language acquisition in children?
People tend to talk about the things that are important to them or the things they think about the most. What we talk about, therefore, is a reflection of our values.

Personal Application Question

Can you think of examples of how language affects cognition?

40.

COGNITION AND EMOTION

Learning Objectives

By the end of this section, you will be able to:

- Describe cognition
- Distinguish concepts and prototypes
- Explain the difference between natural and artificial concepts

Imagine all of your thoughts as if they were physical entities, swirling rapidly inside your mind. How is it possible that the brain is able to move from one thought to the next in an organized, orderly fashion? The brain is endlessly perceiving, processing, planning, organizing, and remembering—it is always active. Yet, you don't notice most of your brain's activity as you move throughout your daily routine. This is only one facet of the complex processes involved in cognition. Simply put, **cognition** is *thinking, and it encompasses the processes associated with perception, knowledge, problem-solving, judgment, language, and memory*. Scientists who study cognition are searching for ways to understand how we integrate, organize, and utilize our conscious cognitive experiences without being aware of all of the unconscious work that our brains are doing (Kahneman, 2011).

Cognition

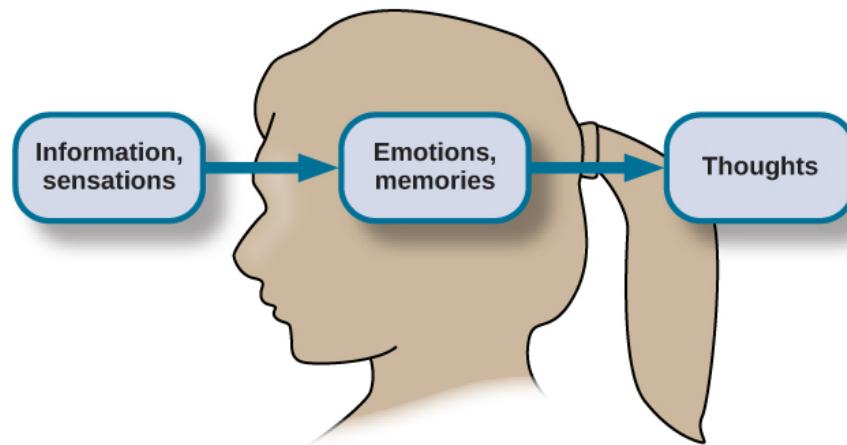
Upon waking each morning, you begin thinking—contemplating the tasks that you must complete that day. In what order should you run your errands? Should you go to the bank, the cleaners, or the grocery store first? Can you get these things done before you head to class or will they need to wait until school is done? These thoughts are one example of cognition at work. Exceptionally complex, cognition is an essential feature of human consciousness, yet not all aspects of cognition are consciously experienced.

Cognitive psychology is the field of psychology dedicated to examining how people think. It attempts to

explain how and why we think the way we do by studying the interactions among human thinking, emotion, creativity, language, and problem-solving, in addition to other cognitive processes. Cognitive psychologists strive to determine and measure different types of intelligence, why some people are better at problem-solving than others, and how emotional intelligence affects success in the workplace, among countless other topics. They also sometimes focus on how we organize thoughts and information gathered from our environments into meaningful categories of thought, which will be discussed later.

Concepts and Prototypes

The human nervous system is capable of handling endless streams of information. The senses serve as the interface between the mind and the external environment, receiving stimuli and translating them into nerve impulses that are transmitted to the brain. The brain then processes this information and uses the relevant pieces to create thoughts, which can then be expressed through language or stored in memory for future use. To make this process more complex, the brain does not gather information from external environments only. When thoughts are formed, the brain also pulls information from emotions and memories. Emotion and memory are powerful influences on both our thoughts and behaviors.



Sensations and information are received by our brains, filtered through emotions and memories, and processed to become thoughts.

In order to organize this staggering amount of information, the brain has developed a file cabinet of sorts in the mind. The different files stored in the file cabinet are called concepts. Concepts are categories or groupings of linguistic information, images, ideas, or memories, such as life experiences. Concepts are, in many ways, big ideas that are generated by observing details and categorizing and combining these details into cognitive structures. You use concepts to see the relationships among the different elements of your experiences and to keep the information in your mind organized and accessible.

Concepts are informed by our semantic memory, a process for giving meaning to experiences and stimuli,

and are present in every aspect of our lives; however, one of the easiest places to notice concepts is inside a classroom, where they are discussed explicitly. When you study United States history, for example, you learn about more than just individual events that have happened in America's past. You absorb a large quantity of information by listening to and participating in discussions, examining maps, and reading first-hand accounts of people's lives. Your brain analyzes these details and develops an overall understanding of American history. In the process, your brain gathers details that inform and refine your understanding of related concepts like democracy, power, and freedom.

Concepts can be complex and abstract, like justice, or more concrete, like types of birds. In psychology, for example, Piaget's stages of development are abstract concepts. Some concepts, like tolerance, are agreed upon by many people because they have been used in various ways over many years. Other concepts, like the characteristics of your ideal friend or your family's birthday traditions, are personal and individualized. In this way, concepts touch every aspect of our lives, from our many daily routines to the guiding principles behind the way governments function.

Another technique used by your brain to organize information is the identification of prototypes for the concepts you have developed. A prototype is the best example or representation of a concept. For example, for the category of civil disobedience, your prototype could be Rosa Parks. Her peaceful resistance to segregation on a city bus in Montgomery, Alabama, is a recognizable example of civil disobedience. Or your prototype could be Mohandas Gandhi, sometimes called Mahatma Gandhi ("Mahatma" is an honorific title).



In 1930, Mohandas Gandhi led a group in peaceful protest against a British tax on salt in India.

Mohandas Gandhi served as a nonviolent force for independence for India while simultaneously demanding

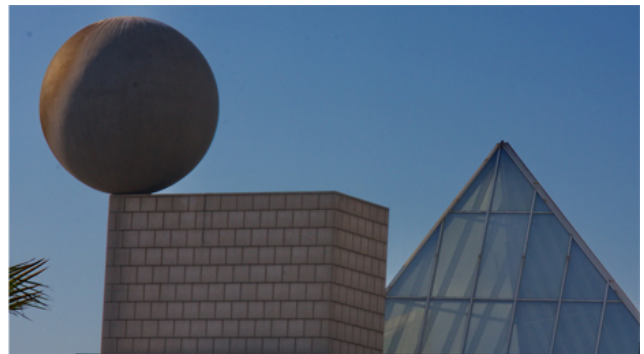
that Buddhist, Hindu, Muslim, and Christian leaders—both Indian and British—collaborate peacefully. Although he was not always successful in preventing violence around him, his life provides a steadfast example of the civil disobedience prototype (Constitutional Rights Foundation, 2013). Just as concepts can be abstract or concrete, we can make a distinction between concepts that are functions of our direct experience with the world and those that are more artificial in nature.

Natural and Artificial Concepts

In psychology, concepts can be divided into two categories, natural and artificial. Natural concepts are created “naturally” through your experiences and can be developed from either direct or indirect experiences. For example, if you live in Essex Junction, Vermont, you have probably had a lot of direct experience with snow. You’ve watched it fall from the sky, you’ve seen lightly falling snow that barely covers the windshield of your car, and you’ve shoveled out 18 inches of fluffy white snow as you’ve thought, “This is perfect for skiing.” You’ve thrown snowballs at your best friend and gone sledding down the steepest hill in town. In short, you know snow. You know what it looks like, smells like, tastes like, and feels like. If, however, you’ve lived your whole life on the island of Saint Vincent in the Caribbean, you may never have actually seen snow, much less tasted, smelled, or touched it. You know snow from the indirect experience of seeing pictures of falling snow—or from watching films that feature snow as part of the setting. Either way, snow is a natural concept because you can construct an understanding of it through direct observations or experiences of snow.



(a)



(b)

(a) Our concept of snow is an example of a natural concept—one that we understand through direct observation and experience. (b) In contrast, artificial concepts are ones that we know by a specific set of characteristics that they always exhibit, such as what defines different basic shapes. (credit a: modification of work by Maarten Takens; credit b: modification of work by “Shayan [USA]”/Flickr)

An artificial concept, on the other hand, is a concept that is defined by a specific set of characteristics. Various properties of geometric shapes, like squares and triangles, serve as useful examples of artificial concepts. A triangle always has three angles and three sides. A square always has four equal sides and four right angles. Mathematical formulas, like the equation for the area ($\text{length} \times \text{width}$), are artificial concepts defined by

specific sets of characteristics that are always the same. Artificial concepts can enhance the understanding of a topic by building on one another. For example, before learning the concept of “area of a square” (and the formula to find it), you must understand what a square is. Once the concept of “area of a square” is understood, an understanding of area for other geometric shapes can be built upon the original understanding of the area. The use of artificial concepts to define an idea is crucial to communicating with others and engaging in complex thought. According to Goldstone and Kersten (2003), concepts act as building blocks and can be connected in countless combinations to create complex thoughts.

Schemata

A **schema** is a *mental construct consisting of a cluster or collection of related concepts* (Bartlett, 1932). There are many different types of schemata, and they all have one thing in common: schemata are a method of organizing information that allows the brain to work more efficiently. When a schema is activated, the brain makes immediate assumptions about the person or object being observed.

There are several types of schemata. A role schema makes assumptions about how individuals in certain roles will behave (Callero, 1994). For example, imagine you meet someone who introduces themselves as a firefighter. When this happens, your brain automatically activates the “firefighter schema” and begins making assumptions that this person is brave, selfless, and community-oriented. Despite not knowing this person, already you have unknowingly made judgments about the individual. Schemata also help you fill in gaps in the information you receive from the world around you. While schemata allow for more efficient information processing, there can be problems with schemata, regardless of whether they are accurate: Perhaps this particular firefighter is not brave, but simply works as a firefighter to pay the bills while studying to become a children’s librarian.

An event schema, also known as a cognitive script, is a set of behaviors that can feel like a routine. Think about what you do when you walk into an elevator. First, the doors open and you wait to let exiting passengers leave the elevator car. Then, you step into the elevator and turn around to face the doors, looking for the correct button to push. You never face the back of the elevator, do you? And when you’re riding in a crowded elevator and you can’t face the front, it feels uncomfortable, doesn’t it? Interestingly, event schemata can vary widely among different cultures and countries. For example, while it is quite common for people to greet one another with a handshake in the United States, in Tibet, you greet someone by sticking your tongue out at them, and in Belize, you bump fists (Cairns Regional Council, n.d.)



What event schema do you perform when riding in an elevator? (credit: "Gideon"/Flickr)

Because event schemata are automatic, they can be difficult to change. Imagine that you are driving home from work or school. This event schema involves getting in the car, shutting the door, and buckling your seatbelt before putting the key in the ignition. You might perform this script two or three times each day. As you drive home, you hear your phone's ring tone. Typically, the event schema that occurs when you hear your phone ringing involves locating the phone and answering it or responding to your latest text message. So without thinking, you reach for your phone, which could be in your pocket, in your bag, or in the passenger seat of the car. This powerful event schema is informed by your pattern of behavior and the pleasurable stimulation that a phone call or text message gives your brain. Because it is a schema, it is extremely challenging for us to stop reaching for the phone, even though we know that we endanger our own lives and the lives of others while we do it (Neyfakh, 2013).



Texting while driving is dangerous, but it is a difficult event schema for some people to resist.

Remember the elevator? It feels almost impossible to walk in and *not* face the door. Our powerful event schema dictates our behavior in the elevator, and it is no different with our phones. Current research suggests that it is the habit, or event schema, of checking our phones in many different situations that makes refraining from checking them while driving especially difficult (Bayer & Campbell, 2012). Because texting while driving has become a dangerous epidemic in recent years, psychologists are looking at ways to help people interrupt the “phone schema” while driving. Event schemata like these are the reason why many habits are difficult to break once they have been acquired. As we continue to examine thinking, keep in mind how powerful the forces of concepts and schemata are to our understanding of the world.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=389#h5p-123>

Summary

In this section, you were introduced to cognitive psychology, which is the study of cognition, or the brain’s ability to think, perceive, plan, analyze, and remember. Concepts and their corresponding prototypes help us quickly organize our thinking by creating categories into which we can sort new information. We also develop schemata, which are clusters of related concepts. Some schemata involve routines of thought and behavior, and these help us function properly in various situations without having to “think twice” about them. Schemata show up in social situations and routines of daily behavior.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=389#h5p-124>

Critical Thinking Questions

Describe an event schema that you would notice at a sporting event.

Answers will vary. When attending a basketball game, it is typical to support your team by wearing the team colors and sitting behind their bench.

Explain why event schemata have so much power over human behavior.

Event schemata are rooted in the social fabric of our communities. We expect people to behave in certain ways in certain types of situations, and we hold ourselves to the same social standards. It is uncomfortable to go against an event schema—it feels almost like we are breaking the rules.

Personal Application Question

Describe a natural concept that you know fully but that would be difficult for someone else to understand, and explain why it would be difficult.

41.

THE SOURCE OF INTELLIGENCE

Learning Objectives

By the end of this section, you will be able to:

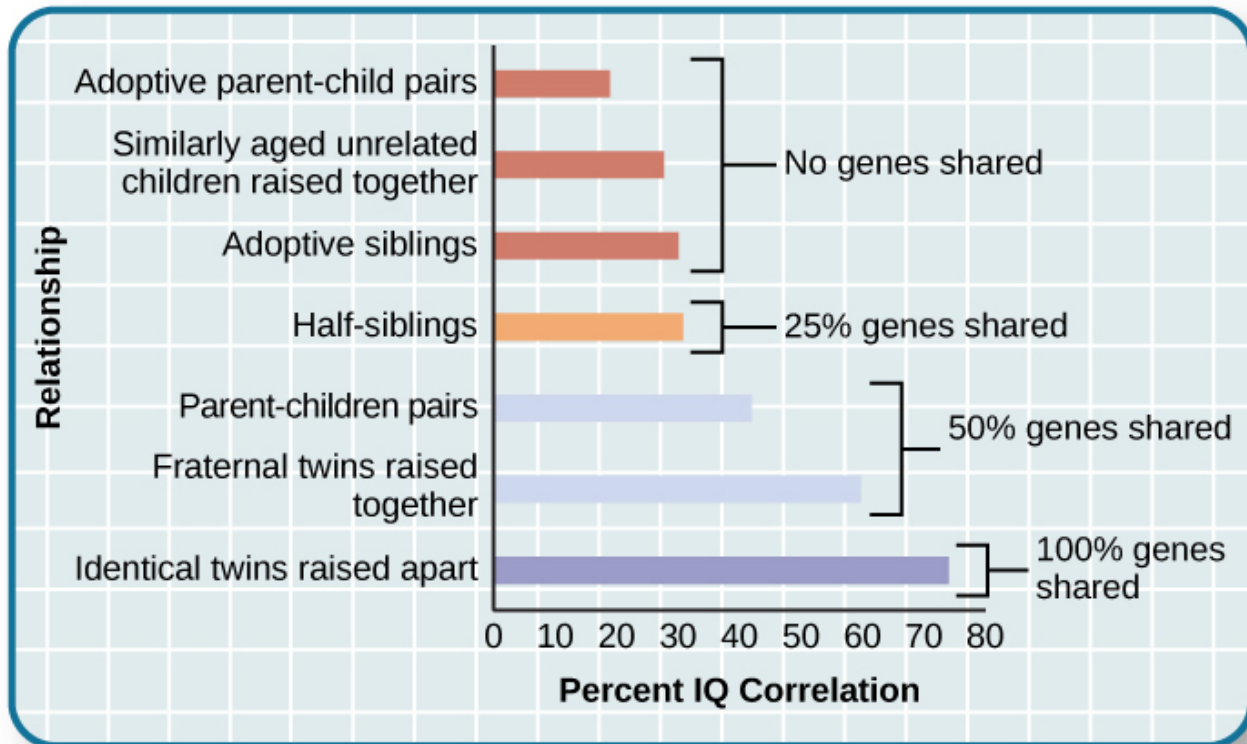
- Describe how genetics and environment affect intelligence
- Explain the relationship between IQ scores and socioeconomic status
- Describe the difference between a learning disability and a developmental disorder

A young girl, born to teenage parents, lives with her grandmother in rural Mississippi. They are poor—in serious poverty—but they do their best to get by with what they have. She learns to read when she is just 3 years old. As she grows older, she longs to live with her mother, who now resides in Wisconsin. She moves there at the age of 6. At 9 years of age, she is raped. During the next several years, several different male relatives repeatedly molest her. Her life unravels. She turns to drugs and sex to fill the deep, lonely void inside her. Her mother then sends her to Nashville to live with her father, who imposes strict behavioral expectations upon her, and over time, her wild life settles once again. She begins to experience success in school, and at 19 years old, becomes the youngest and first African American female news anchor (“Dates and Events,” n.d.). The woman—Oprah Winfrey—goes on to become a media giant known for both her intelligence and her empathy.

High Intelligence: Nature or Nurture?

Where does high intelligence come from? Some researchers believe that intelligence is a trait inherited from a person’s parents. Scientists who research this topic typically use twin studies to determine the heritability of intelligence. The Minnesota Study of Twins Reared Apart is one of the most well-known twin studies. In this investigation, researchers found that identical twins raised together and identical twins raised apart exhibit a higher correlation between their IQ scores than siblings or fraternal twins raised together (Bouchard, Lykken,

McGue, Segal, & Tellegen, 1990). The findings from this study reveal a genetic component to intelligence. At the same time, other psychologists believe that intelligence is shaped by a child's developmental environment. If parents were to provide their children with intellectual stimulation before they are born, it is likely that they would absorb the benefits of that stimulation, and it would be reflected in intelligence levels.



The correlations of IQs of unrelated versus related persons reared apart or together suggest a genetic component to intelligence.

The reality is that aspects of each idea are probably correct. In fact, one study suggests that although genetics seem to be in control of the level of intelligence, the environmental influences provide both stability and change to trigger the manifestation of cognitive abilities (Bartels, Rietveld, Van Baal, & Boomsma, 2002). Certainly, there are behaviors that support the development of intelligence, but the genetic component of high intelligence should not be ignored. As with all heritable traits, however, it is not always possible to isolate how and when high intelligence is passed on to the next generation.

Range of Reaction is the theory that each person responds to the environment in a unique way based on his or her genetic makeup (Hunt, 1981). According to this idea, your genetic potential is a fixed quantity, but whether you reach your full intellectual potential is dependent upon the environmental stimulation you experience, especially in childhood. Think about this scenario: A couple adopts a child who has average genetic intellectual potential. They raise her in an extremely stimulating environment. What will happen to the couple's new daughter? It is likely that the stimulating environment will improve her intellectual

outcomes over the course of her life. But what happens if this experiment is reversed? If a child with an extremely strong genetic background is placed in an environment that does not stimulate him: What happens? Interestingly, according to a longitudinal study of highly gifted individuals, it was found that “the two extremes of optimal and pathological experience are both represented disproportionately in the backgrounds of creative individuals”; however, those who experienced supportive family environments were more likely to report being happy (Csikszentmihalyi & Csikszentmihalyi, 1993, p. 187).

Another challenge to determining the origins of high intelligence is the confounding nature of our human social structures. It is troubling to note that some ethnic groups perform better on IQ tests than others—and it is likely that the results do not have much to do with the quality of each ethnic group’s intellect. The same is true for socioeconomic status. Children who live in poverty experience more pervasive, daily stress than children who do not worry about the basic needs of safety, shelter, and food. These worries can negatively affect how the brain functions and develops, causing a dip in IQ scores. Mark Kishiyama and his colleagues determined that children living in poverty demonstrated reduced prefrontal brain functioning comparable to children with damage to the lateral prefrontal cortex (Kishiyama, Boyce, Jimenez, Perry, & Knight, 2009).

The debate around the foundations and influences on intelligence exploded in 1969 when an educational psychologist named Arthur Jensen published the article “How Much Can We Boost I.Q. and Achievement” in the *Harvard Educational Review*. Jensen had administered IQ tests to diverse groups of students, and his results led him to the conclusion that IQ is determined by genetics. He also posited that intelligence was made up of two types of abilities: Level I and Level II. In his theory, Level I is responsible for rote memorization, whereas Level II is responsible for conceptual and analytical abilities. According to his findings, Level I remained consistent among the human race. Level II, however, exhibited differences among ethnic groups (Modgil & Routledge, 1987). Jensen’s most controversial conclusion was that Level II intelligence is prevalent among Asians, then Caucasians, then African Americans. Robert Williams was among those who called out racial bias in Jensen’s results (Williams, 1970).

Obviously, Jensen’s interpretation of his own data caused an intense response in a nation that continued to grapple with the effects of racism (Fox, 2012). However, Jensen’s ideas were not solitary or unique; rather, they represented one of many examples of psychologists asserting racial differences in IQ and cognitive ability. In fact, Rushton and Jensen (2005) reviewed three decades’ worth of research on the relationship between race and cognitive ability. Jensen’s belief in the inherited nature of intelligence and the validity of the IQ test to be the truest measure of intelligence is at the core of his conclusions. If, however, you believe that intelligence is more than Levels I and II, or that IQ tests do not control for socioeconomic and cultural differences among people, then perhaps you can dismiss Jensen’s conclusions as a single window that looks out on the complicated and varied landscape of human intelligence.

In a related story, parents of African American students filed a case against the State of California in 1979, because they believed that the testing method used to identify students with learning disabilities was culturally unfair as the tests were normed and standardized using white children (*Larry P. v. Riles*). The testing method used by the state disproportionately identified African American children as intellectually disabled.

This resulted in many students being incorrectly classified as “mentally retarded.” According to a summary of the case, *Larry P. v. Riles*:

In violation of Title VI of the Civil Rights Act of 1964, the Rehabilitation Act of 1973, and the Education for All Handicapped Children Act of 1975, defendants have utilized standardized intelligence tests that are racially and culturally biased, have a discriminatory impact against black children, and have not been validated for the purpose of essentially permanent placements of black children into educationally dead-end, isolated, and stigmatizing classes for the so-called educable mentally retarded. Further, these federal laws have been violated by defendants’ general use of placement mechanisms that, taken together, have not been validated and result in a large over-representation of black children in the special E.M.R. classes. (*Larry P. v. Riles*, par. 6)

Once again, the limitations of intelligence testing were revealed.

What are Learning Disabilities?

Learning disabilities are *cognitive disorders that affect different areas of cognition, particularly language or reading*. It should be pointed out that learning disabilities are not the same thing as intellectual disabilities. Learning disabilities are considered specific neurological impairments rather than global intellectual or developmental disabilities. A person with a language disability has difficulty understanding or using spoken language, whereas someone with a reading disability, such as dyslexia, has difficulty processing what he or she is reading.

Often, learning disabilities are not recognized until a child reaches school age. One confounding aspect of learning disabilities is that they often affect children with average to above-average intelligence. At the same time, learning disabilities tend to exhibit comorbidity with other disorders, like attention-deficit hyperactivity disorder (ADHD). Anywhere between 30–70% of individuals with diagnosed cases of ADHD also have some sort of learning disability (Riccio, Gonzales, & Hynd, 1994). Let’s take a look at two examples of common learning disabilities: dysgraphia and dyslexia.

Dysgraphia

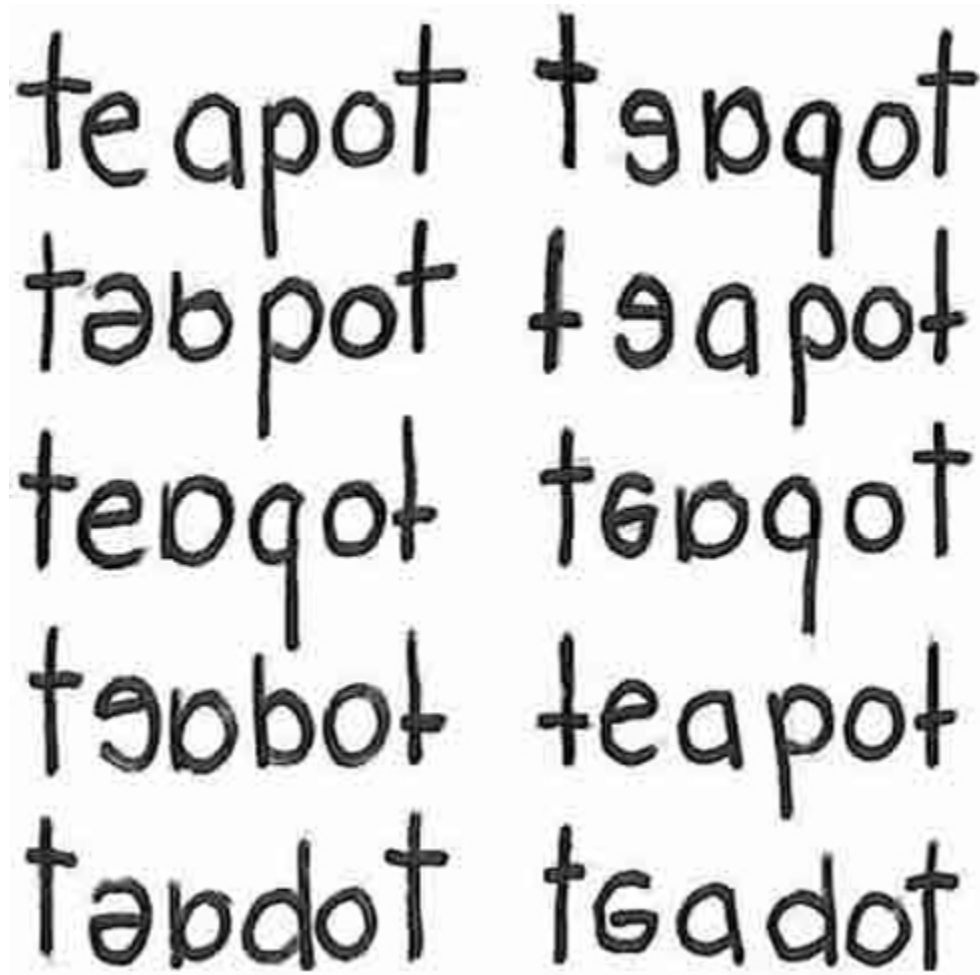
Children with dysgraphia have a learning disability that results in a struggle to write legibly. The physical task of writing with a pen and paper is extremely challenging for the person. These children often have extreme difficulty putting their thoughts down on paper (Smits-Engelsman & Van Galen, 1997). This difficulty is inconsistent with a person’s IQ. That is, based on the child’s IQ and/or abilities in other areas, a child with dysgraphia should be able to write, but can’t. Children with dysgraphia may also have problems with spatial abilities.

Students with dysgraphia need academic accommodations to help them succeed in school. These accommodations can provide students with alternative assessment opportunities to demonstrate what they

know (Barton, 2003). For example, a student with dysgraphia might be permitted to take an oral exam rather than a traditional paper-and-pencil test. Treatment is usually provided by an occupational therapist, although there is some question as to how effective such treatment is (Zwicker, 2005).

Dyslexia

Dyslexia is the most common learning disability in children. An individual with dyslexia exhibits an inability to correctly process letters. The neurological mechanism for sound processing does not work properly in someone with dyslexia. As a result, dyslexic children may not understand sound-letter correspondence. A child with dyslexia may mix up letters within words and sentences—letter reversals are a hallmark of this learning disability—or skip whole words while reading. A child experiencing dyslexia may have difficulty spelling words correctly while writing. Because of the disordered way that the brain processes letters and sounds, learning to read is a frustrating experience. Some individuals experiencing dyslexia cope by memorizing the shapes of most words, but they never actually learn to read (Berninger, 2008).



These written words show variations of the word “teapot” as written by individuals with dyslexia.

Summary

Genetics and environment affect intelligence and the challenges of certain learning disabilities. The intelligence levels of all individuals seem to benefit from rich stimulation in their early environments. Highly intelligent individuals, however, may have a built-in resiliency that allows them to overcome difficult obstacles in their upbringing. Learning disabilities can cause major challenges for children who are learning to read and write. Unlike developmental disabilities, learning disabilities are strictly neurological in nature and are not related to intelligence levels. Students with dyslexia, for example, may have extreme difficulty learning to read, but their intelligence levels are typically average or above average.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=399#h5p-137>

Critical Thinking Questions

What evidence exists for a genetic component to an individual's IQ?

Twin studies are one strong indication that IQ has a genetic component. Another indication is anecdotal evidence in the form of stories about highly intelligent individuals who come from difficult backgrounds yet still become highly successful adults.

Describe the relationship between learning disabilities and intellectual disabilities to intelligence.

Learning disabilities are specific neurological problems within the brain and are separate from intelligence. Intellectual disabilities are pervasive and related to intelligence.

Personal Application Question

Do you believe your level of intelligence was improved because of the stimuli in your childhood environment? Why or why not?

42.

REFERENCES

Abler, W. (2013). Sapir, Harris, and Chomsky in the twentieth century. *Cognitive Critique*, 7, 29–48.

American Association on Intellectual and Developmental Disabilities. (2013). Definition of intellectual disability. Retrieved from <http://aaidd.org/intellectual-disability/definition#.UmkR2xD2Bh4>

American Psychological Association. (2013). In *Diagnostic and statistical manual of psychological disorders* (5th ed., pp. 34–36). Washington, D. C.: American Psychological Association.

Atkins v. Virginia, 00-8452 (2002).

Bartels, M., Rietveld, M., Van Baal, G., & Boomsma, D. I. (2002). Genetic and environmental influences on the development of intelligence. *Behavior Genetics*, 32(4), 237–238.

Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge, England: Cambridge University Press.

Bayer, J. B., & Campbell, S. W. (2012). Texting while driving on automatic: Considering the frequency-independent side of habit. *Computers in Human Behavior*, 28, 2083–2090.

Barton, S. M. (2003). Classroom accommodations for students with dyslexia. *Learning Disabilities Journal*, 13, 10–14.

Berlin, B., & Kay, P. (1969). *Basic color terms: Their universality and evolution*. Berkeley: University of California Press.

Berninger, V. W. (2008). Defining and differentiating dysgraphia, dyslexia, and language learning disability within a working memory model. In M. Mody & E. R. Silliman (Eds.), *Brain, behavior, and learning in language and reading disorders* (pp. 103–134). New York: Guilford Press.

Blossom, M., & Morgan, J. L. (2006). Does the face say what the mouth says? A study of infants' sensitivity to visual prosody. In the 30th annual Boston University Conference on Language Development, Somerville, MA.

Boake, C. (2002, May 24). From the Binet-Simon to the Wechsler-Bellevue: Tracing the history of intelligence testing. *Journal of Clinical and Experimental Neuropsychology*, 24(3), 383–405.

Boroditsky, L. (2001). Does language shape thought? Mandarin and English speakers' conceptions of time. *Cognitive Psychology*, 43, 1–22.

Boroditsky, L. (2011, February). How language shapes thought. *Scientific American*, 63–65.

Bouchard, T. J., Lykken, D. T., McGue, M., Segal, N. L., & Tellegen, A. (1990). Sources of human psychological differences: The Minnesota Study of Twins Reared Apart. *Science*, 250, 223–228.

- Cairns Regional Council. (n.d.). Cultural greetings. Retrieved from http://www.cairns.qld.gov.au/__data/assets/pdf_file/0007/8953/CulturalGreetingExercise.pdf
- Callero, P. L. (1994). From role-playing to role-using: Understanding role as resource. *Social Psychology Quarterly*, 57, 228–243.
- Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge, MA: MIT Press
- Corballis, M. C., & Suddendorf, T. (2007). Memory, time, and language. In C. Pasternak (Ed.), *What makes us human* (pp. 17–36). Oxford, UK: Oneworld Publications.
- Constitutional Rights Foundation. (2013). Gandhi and civil disobedience. Retrieved from <http://www.crf-usa.org/black-history-month/gandhi-and-civil-disobedience>
- Csikszentmihalyi, M., & Csikszentmihalyi, I. (1993). Family influences on the development of giftedness. *Ciba Foundation Symposium*, 178, 187–206.
- Curtiss, S. (1981). Dissociations between language and cognition: Cases and implications. *Journal of Autism and Developmental Disorders*, 11(1), 15–30.
- Cyclopedia of Puzzles. (n.d.) Retrieved from <http://www.mathpuzzle.com/loyd/>
- Dates and Events. (n.d.). Oprah Winfrey timeline. Retrieved from <http://www.datesandevents.org/people-timelines/05-oprah-winfrey-timeline.htm>
- Fernández, E. M., & Cairns, H. S. (2011). *Fundamentals of psycholinguistics*. West Sussex, UK: Wiley-Blackwell.
- Flanagan, D., & Kaufman, A. (2004). *Essentials of WISC-IV assessment*. Hoboken: John Wiley and Sons, Inc.
- Flynn, J., Shaughnessy, M. F., & Fulgham, S. W. (2012). Interview with Jim Flynn about the Flynn effect. *North American Journal of Psychology*, 14(1), 25–38.
- Fox, M. (2012, November 1). Arthur R. Jensen dies at 89; Set off debate about I.Q. *New York Times*, p. B15.
- Fromkin, V., Krashen, S., Curtiss, S., Rigler, D., & Rigler, M. (1974). The development of language in Genie: A case of language acquisition beyond the critical period. *Brain and Language*, 1, 81–107.
- Goad, B. (2013, January 25). SSA wants to stop calling people ‘mentally retarded.’ Retrieved from <http://thehill.com/blogs/regwatch/pending-regs/279399-ssa-wants-to-stop-calling-people-mentally-retarded>
- Goldstone, R. L., & Kersten, A. (2003). Concepts and categorization. In A. F. Healy, R. W. Proctor, & I.B. Weiner (Eds.), *Handbook of psychology* (Volume IV, pp. 599–622). Hoboken, New Jersey: John Wiley & Sons, Inc.
- Gordon, O. E. (1995). Francis Galton (1822–1911). Retrieved from <http://www.psych.utah.edu/gordon/Classes/Psy4905Docs/PsychHistory/Cards/Galton.html>
- Gresham, F. M., & Witt, J. C. (1997). Utility of intelligence tests for treatment planning, classification, and placement decisions: Recent empirical findings and future directions. *School Psychology Quarterly*, 12(3), 249–267.

- Hunt, J. M. (1981). Comments on “the modification of intelligence through early experience” by Ramey and Haskins. *Intelligence*, 5(1), 21-27.
- Jensen, J. (2011). Phoneme acquisition: Infants and second language learners. *The Language Teacher*, 35(6), 24–28.
- Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21, 60–99.
- Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Straus, and Giroux.
- Kishiyama, M. M., Boyce, W. T., Jimenez, A. M., Perry, L. M., & Knight, R. T. (2009). Socioeconomic disparities affect prefrontal function in children. *Journal of Cognitive Neuroscience*, 21(6), 1106–1115.
- Larry P v. Riles, C-71-2270 RFP. (1979).
- Legg, S. & Hutter, M. (2007). Universal intelligence: A definition of machine intelligence. *Minds and Machines*, 17(4), 391-444.
- Lenneberg, E. (1967). *Biological foundations of language*. New York: Wiley.
- Liptak, A. (2008, January 19). Lawyer reveals secret, toppling death sentence. *New York Times*. Retrieved from http://www.nytimes.com/2008/01/19/us/19death.html?_r=0
- Modgil, S., & Routledge, C. M. (Eds.). (1987). *Arthur Jensen: Consensus and controversy*. New York: Falmer Press.
- Moskowitz, B. A. (1978). The acquisition of language. *Scientific American*, 239, 92–108.
- Petitto, L. A., Holowka, S., Sergio, L. E., Levy, B., & Ostry, D. J. (2004). Baby hands that move to the rhythm of language: Hearing babies acquiring sign languages babble silently on the hands. *Cognition*, 93, 43–73.
- Neyfakh, L. (2013, October 7). “Why you can’t stop checking your phone.” Retrieved from <http://www.bostonglobe.com/ideas/2013/10/06/why-you-can-stop-checking-your-phone/rrBJzyBGDAr1YIEH5JQDcM/story.html>
- Petitto, L. A., Holowka, S., Sergio, L. E., Levy, B., & Ostry, D. J. (2004). Baby hands that move to the rhythm of language: Hearing babies acquiring sign languages babble silently on the hands. *Cognition*, 93, 43–73.
- Pickens, J. (1994). Full-term and preterm infants’ perception of face-voice synchrony. *Infant Behavior and Development*, 17, 447–455.
- Regier, T., & Kay, P. (2009). Language, thought, and color: Whorf was half right. *Trends in Cognitive Sciences*, 13(10), 439–446.
- Riccio, C. A., Gonzales, J. J., & Hynd, G. W. (1994). Attention-deficit Hyperactivity Disorder (ADHD) and learning disabilities. *Learning Disability Quarterly*, 17, 311–322.
- Richardson, K. (2002). What IQ tests test. *Theory & Psychology*, 12(3), 283–314.
- Roberts, D. (2014, May 27). U.S. Supreme Court bars Florida from using IQ score cutoff for executions. *The Guardian*. Retrieved from <http://www.theguardian.com/world/2014/may/27/us-supreme-court-iq-score-cutoff-florida-execution>
- Rushton, J. P., & Jensen, A. R. (2005). Thirty years of research on race differences in cognitive ability. *Psychology, public policy, and law*, 11(2), 235–294.

- Rymer, R. (1993). *Genie: A Scientific Tragedy*. New York: Harper Collins.
- Sapir, E. (1964). *Culture, language, and personality*. Berkeley: University of California Press. (Original work published 1941)
- Schlinger, H. D. (2003). The myth of intelligence. *The Psychological Record*, 53(1), 15–32.
- Severson, K. (2011, December 9). Thousands sterilized, a state weighs restitution. *The New York Times*. Retrieved from http://www.nytimes.com/2011/12/10/us/redress-weighed-for-forced-sterilizations-in-north-carolina.html?pagewanted=all&_r=0
- Singleton, D. M. (1995). Introduction: A critical look at the critical period hypothesis in second language acquisition research. In D.M. Singleton & Z. Lengyel (Eds.), *The age factor in second language acquisition: A critical look at the critical period hypothesis in second language acquisition research* (pp. 1–29). Avon, UK: Multilingual Matters Ltd.
- Skinner, B. F. (1957). *Verbal behavior*. Acton, MA: Copley Publishing Group.
- Smits-Engelsman, B. C. M., & Van Galen, G. P. (1997). Dysgraphia in children: Lasting psychomotor deficiency or transient developmental delay? *Journal of Experimental Child Psychology*, 67, 164–184.
- Spelke, E. S., & Cortelou, A. (1981). Perceptual aspects of social knowing: Looking and listening in infancy. In M.E. Lamb & L.R. Sherrod (Eds.), *Infant social cognition: Empirical and theoretical considerations* (pp. 61–83). Hillsdale, NJ: Erlbaum.
- Steitz, T. (2010). Thomas A. Steitz – Biographical. (K. Grandin, Ed.) Retrieved from http://www.nobelprize.org/nobel_prizes/chemistry/laureates/2009/steitz-bio.html
- Sternberg, R. J. (1988). *The triarchic mind: A new theory of intelligence*. New York: Viking-Penguin.
- Terman, L. M. (1925). *Mental and physical traits of a thousand gifted children (I)*. Stanford, CA: Stanford University Press.
- Terman, L. M., & Oden, M. H. (1947). *The gifted child grows up: 25 years' follow-up of a superior group: Genetic studies of genius (Vol. 4)*. Stanford, CA: Stanford University Press.
- Terman, L. M. (1916). *The measurement of intelligence*. Boston: Houghton-Mifflin.
- Tomasello, M., & Rakoczy, H. (2003). What makes human cognition unique? From individual to shared to collective intentionality. *Mind & Language*, 18(2), 121–147.
- van Troyer, G. (1994). Linguistic determinism and mutability: The Sapir-Whorf “hypothesis” and intercultural communication. *JALT Journal*, 2, 163–178.
- Wechsler, D. (1958). *The measurement of adult intelligence*. Baltimore: Williams & Wilkins.
- Wechsler, D. (1981). *Manual for the Wechsler Adult Intelligence Scale—revised*. New York: Psychological Corporation.
- Wechsler, D. (2002). *WPPSI-R manual*. New York: Psychological Corporation.
- Werker, J. F., & Lalonde, C. E. (1988). Cross-language speech perception: Initial capabilities and developmental change. *Developmental Psychology*, 24, 672–683.
- Werker, J. F., & Tees, R. C. (1984). Cross-language speech perception: Evidence for perceptual reorganization during the first year of life. *Infant Behavior and Development*, 7, 49–63.

Whorf, B. L. (1956). *Language, thought and relativity*. Cambridge, MA: MIT Press.

Williams, R. L., (1970). Danger: Testing and dehumanizing black children. *Clinical Child Psychology Newsletter*, 9(1), 5–6.

Zwicker, J. G. (2005). Effectiveness of occupational therapy in remediating handwriting difficulties in primary students: Cognitive versus multisensory interventions. Unpublished master's thesis, University of Victoria, Victoria, British Columbia, Canada. Retrieved from <http://dspace.library.uvic.ca:8080/bitstream/handle/1828/49/Zwicker%20thesis.pdf?sequence=1>

PART IX

MEMORY



Photographs can trigger our memories and bring past experiences back to life. (credit: modification of work by Cory Zanker)

We may be top-notch learners, but if we don't have a way to store what we've learned, what good is the knowledge we've gained?

Take a few minutes to imagine what your day might be like if you could not remember anything you had learned. You would have to figure out how to get dressed. What clothing should you wear, and how do buttons and zippers work? You would need someone to teach you how to brush your teeth and tie your shoes. Who would you ask for help with these tasks, since you wouldn't recognize the faces of these people in your house? Wait . . . is this even your house? Uh oh, your stomach begins to rumble and you feel hungry. You'd like something to eat, but you don't know where the food is kept or even how to prepare it. Oh dear, this is getting confusing. Maybe it would be best to just go back to bed. A bed . . . what is a bed?

We have an amazing capacity for memory, but how, exactly, do we process and store information? Are there different kinds of memory, and if so, what characterizes the different types? How, exactly, do we retrieve our memories? And why do we forget? This chapter will explore these questions as we learn about memory.

43.

HOW MEMORY FUNCTIONS

Learning Objectives

By the end of this section, you will be able to:

- Discuss the three basic functions of memory
- Describe the three stages of memory storage
- Describe and distinguish between procedural and declarative memory and semantic and episodic memory

Memory is an information processing system; therefore, we often compare it to a computer. **Memory** *is the set of processes used to encode, store, and retrieve information over different periods of time.*



Encoding involves the input of information into the memory system. Storage is the retention of the encoded information. Retrieval, or getting the information out of memory and back into awareness, is the third function.

Encoding

We get information into our brains through a process called **encoding**, *which is the input of information into the memory system.* Once we receive sensory information from the environment, our brains label or code it.

We organize the information with other similar information and connect new concepts to existing concepts. Encoding information occurs through automatic processing and effortful processing.

If someone asks you what you ate for lunch today, more than likely you could recall this information quite easily. This is known as **automatic processing**, *or the encoding of details like time, space, frequency, and the meaning of words*. Automatic processing is usually done without any conscious awareness. Recalling the last time you studied for a test is another example of automatic processing. But what about the actual test material you studied? It probably *required a lot of work and attention on your part in order to encode that information*. This is known as **effortful processing**.



When you first learn new skills such as driving a car, you have to put forth effort and attention to encode information about how to start a car, how to brake, how to handle a turn, and so on. Once you know how to drive, you can encode additional information about this skill automatically. (credit: Robert Couse-Baker)

What are the most effective ways to ensure that important memories are well encoded? Even a simple sentence is easier to recall when it is meaningful (Anderson, 1984). Read the following sentences (Bransford & McCarrell, 1974), then look away and count backward from 30 by threes to zero, and then try to write down the sentences (no peeking back at this page!).

1. The notes were sour because the seams split.
2. The voyage wasn't delayed because the bottle shattered.
3. The haystack was important because the cloth ripped.

How well did you do? By themselves, the statements that you wrote down were most likely confusing and difficult for you to recall. Now, try writing them again, using the following prompts: bagpipe, ship christening,

and parachutist. Next, count backward from 40 by fours, then check yourself to see how well you recalled the sentences this time. You can see that the sentences are now much more memorable because each of the sentences was placed in context. Material is far better encoded when you make it meaningful.

There are three types of encoding. *The encoding of words and their meanings is known as* **semantic encoding**. It was first demonstrated by William Bousfield (1935) in an experiment in which he asked people to memorize words. The 60 words were actually divided into 4 categories of meaning, although the participants did not know this because the words were randomly presented. When they were asked to remember the words, they tended to recall them in categories, showing that they paid attention to the meanings of the words as they learned them.

Visual encoding *is the encoding of images*, and **acoustic encoding** *is the encoding of sounds, words in particular*. To see how visual encoding works, read over this list of words: *car, level, dog, truth, book, value*. If you were asked later to recall the words from this list, which ones do you think you'd most likely remember? You would probably have an easier time recalling the words *car, dog*, and *book*, and a more difficult time recalling the words *level, truth*, and *value*. Why is this? Because you can recall images (mental pictures) more easily than words alone. When you read the words *car, dog*, and *book*, you created images of these things in your mind. These are concrete, high-imagery words. On the other hand, abstract words like *level, truth*, and *value* are low-imagery words. High-imagery words are encoded both visually and semantically (Paivio, 1986), thus building a stronger memory.

Now let's turn our attention to acoustic encoding. You are driving in your car and a song comes on the radio that you haven't heard in at least 10 years, but you sing along, recalling every word. In the United States, children often learn the alphabet through song, and they learn the number of days in each month through rhyme: "Thirty days hath September, / April, June, and November; / All the rest have thirty-one, / Save February, with twenty-eight days clear, / And twenty-nine each leap year." These lessons are easy to remember because of acoustic encoding. We encode the sounds the words make. This is one of the reasons why much of what we teach young children is done through song, rhyme, and rhythm.

Which of the three types of encoding do you think would give you the best memory of verbal information? Some years ago, psychologists Fergus Craik and Endel Tulving (1975) conducted a series of experiments to find out. Participants were given words along with questions about them. The questions required the participants to process the words at one of the three levels. The visual processing questions included such things as asking the participants about the font of the letters. The acoustic processing questions asked the participants about the sound or rhyming of the words, and the semantic processing questions asked the participants about the meaning of the words. After participants were presented with the words and questions, they were given an unexpected recall or recognition task.

Words that had been encoded semantically were better remembered than those encoded visually or acoustically. Semantic encoding involves a deeper level of processing than the shallower visual or acoustic encoding. Craik and Tulving concluded that we process verbal information best through semantic encoding, especially if we apply what is called the self-reference effect. The **self-reference effect** *is the tendency for an*

individual to have better memory for information that relates to oneself in comparison to material that has less personal relevance (Rogers, Kuiper & Kirker, 1977). Could semantic encoding be beneficial to you as you attempt to memorize the concepts in this chapter?

Test Your Understanding



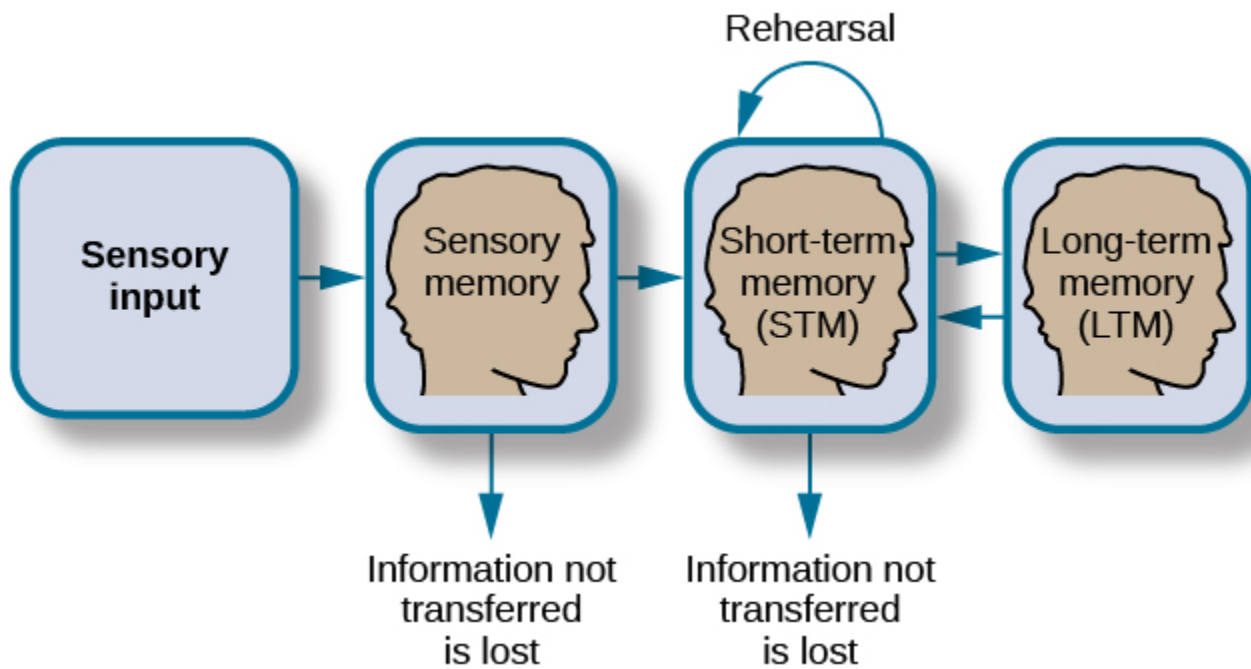
An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=501#h5p-142>

Storage

Once the information has been encoded, we have to somehow have to retain it. Our brains take the encoded information and place it in storage. **Storage** *is the creation of a permanent record of information.*

In order for a memory to go into storage (i.e., long-term memory), it has to pass through three distinct stages: Sensory Memory, Short-Term Memory, and finally Long-Term Memory. These stages were first proposed by Richard Atkinson and Richard Shiffrin (1968). Their model of human memory, called **Atkinson-Shiffrin (A-S)**, *is based on the belief that we process memories in the same way that a computer processes information.*



According to the Atkinson-Shiffrin model of memory, information passes through three distinct stages in order for it to be stored in long-term memory.

But A-S is just one model of memory. Others, such as Baddeley and Hitch (1974), have proposed a model where short-term memory itself has different forms. In this model, storing memories in short-term memory is like opening different files on a computer and adding information. The type of short-term memory (or computer file) depends on the type of information received. There are memories in visual-spatial form, as well as memories of spoken or written material, and they are stored in three short-term systems: a visuospatial sketchpad, an episodic buffer, and a phonological loop. According to Baddeley and Hitch, a central executive part of memory supervises or controls the flow of information to and from the three short-term systems.

Sensory Memory

In the Atkinson-Shiffrin model, stimuli from the environment are processed first in **sensory memory**: *storage of brief sensory events, such as sights, sounds, and tastes*. It is very brief storage—up to a couple of seconds. We are constantly bombarded with sensory information. We cannot absorb all of it, or even most of it. And most of it has no impact on our lives. For example, what was your professor wearing during the last class period? As long as the professor was dressed appropriately, it did not really matter what she was wearing. Sensory information about sights, sounds, smells, and even textures, which we do not view as valuable information, we discard. If we view something as valuable, the information will move into our short-term memory system.

One study of sensory memory researched the significance of valuable information on short-term memory storage. J. R. Stroop discovered a memory phenomenon in the 1930s: you will name a color more easily if it

appears printed in that color, which is called the Stroop effect. In other words, the word “red” will be named more quickly, regardless of the color the word appears in, than any word that is colored red. Do not read the words, but say the color the word is printed in. For example, upon seeing the word “yellow” in green print, you should say “green,” not “yellow.” This experiment is fun, but it’s not as easy as it seems.



The Stroop effect describes why it is difficult for us to name a color when the word and the color of the word are different.

Short-Term Memory

Short-term memory (STM) is a temporary storage system that processes incoming sensory memory; sometimes it is called *working memory*. Short-term memory takes information from sensory memory and sometimes connects that memory to something already in long-term memory. Short-term memory storage lasts about 20 seconds. George Miller (1956), in his research on the capacity of memory, found that most people can retain about 7 items in STM. Some remember 5, some 9, so he called the capacity of STM 7 plus or minus 2.

Think of short-term memory as the information you have displayed on your computer screen—a document, a spreadsheet, or a web page. Then, information in short-term memory goes to long-term memory (you save it to your hard drive), or it is discarded (you delete a document or close a web browser). *This step of rehearsal, the conscious repetition of information to be remembered, to move STM into long-term memory is called **memory consolidation**.*

You may find yourself asking, “How much information can our memory handle at once?” To explore the capacity and duration of your short-term memory, have a partner read the strings of random numbers out loud

to you, beginning each string by saying, “Ready?” and ending each by saying, “Recall,” at which point you should try to write down the string of numbers from memory.

9754 68259 913825 5316842 86951372 719384273
6419 67148 648327 5963827 51739826 163875942

Work through this series of numbers using the recall exercise explained above to determine the longest string of digits that you can store.

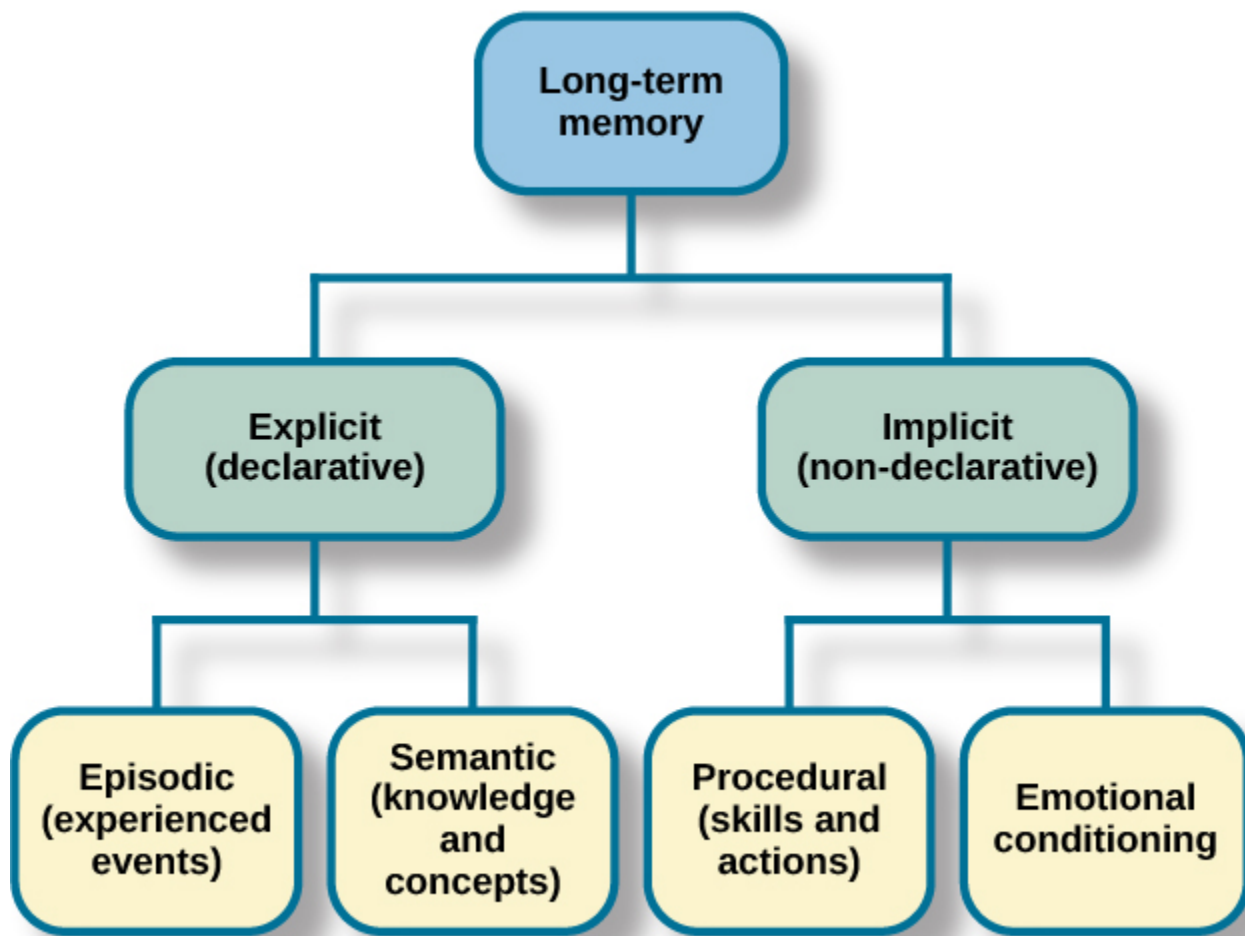
Note the longest string at which you got the series correct. For most people, this will be close to 7, Miller’s famous 7 plus or minus 2. Recall is somewhat better for random numbers than for random letters (Jacobs, 1887), and also often slightly better for information we hear (acoustic encoding) rather than see (visual encoding) (Anderson, 1969).

Long-term Memory

Long-term memory (LTM) *is the continuous storage of information.* Unlike short-term memory, the storage capacity of LTM has no limits. It encompasses all the things you can remember that happened more than just a few minutes ago to all of the things that you can remember that happened days, weeks, and years ago. In keeping with the computer analogy, the information in your LTM would be like the information you have saved on the hard drive. It isn’t there on your desktop (your short-term memory), but you can pull up this information when you want it, at least most of the time. Not all long-term memories are strong memories. Some memories can only be recalled through prompts. For example, you might easily recall a fact— “What is the capital of the United States?”—or a procedure—“How do you ride a bike?”—but you might struggle to recall the name of the restaurant you had dinner at when you were on vacation in France last summer. A prompt, such as that the restaurant was named after its owner, who spoke to you about your shared interest in soccer, may help you recall the name of the restaurant.

Long-term memory is divided into two types: explicit and implicit. Understanding the different types is important because a person’s age or particular types of brain trauma or disorders can leave certain types of LTM intact while having disastrous consequences for other types. **Explicit memories** *are those we consciously try to remember and recall.* For example, if you are studying for your chemistry exam, the material you are learning will be part of your explicit memory. (Note: Sometimes, but not always, the terms explicit memory and declarative memory are used interchangeably.)

Implicit memories *are memories that are not part of our consciousness.* They are memories formed from behaviors. Implicit memory is also called non-declarative memory.



There are two components of long-term memory: explicit and implicit. Explicit memory includes episodic and semantic memory. Implicit memory includes procedural memory and things learned through conditioning.

Procedural memory is a type of implicit memory: it stores information about how to do things. It is the memory for skilled actions, such as how to brush your teeth, how to drive a car, and how to swim the crawl (freestyle) stroke. If you are learning how to swim freestyle, you practice the stroke: how to move your arms, how to turn your head to alternate breathing from side to side, and how to kick your legs. You would practice this many times until you become good at it. Once you learn how to swim freestyle and your body knows how to move through the water, you will never forget how to swim freestyle, even if you do not swim for a couple of decades. Similarly, if you present an accomplished guitarist with a guitar, even if he has not played in a long time, he will still be able to play quite well.

Declarative memory has to do with the storage of facts and events we personally experienced. Explicit (declarative) memory has two parts: semantic memory and episodic memory. Semantic means having to do with language and knowledge about language. An example would be the question “What does *argumentative*

mean?” Stored in our semantic memory *is knowledge about words, concepts, and language-based knowledge and facts*. For example, answers to the following questions are stored in your semantic memory:

- Who was the first president of the United States?
- What is democracy?
- What is the longest river in the world?

Episodic memory *is information about events we have personally experienced*. The concept of episodic memory was first proposed about 40 years ago (Tulving, 1972). Since then, Tulving and others have looked at scientific evidence and reformulated the theory. Currently, scientists believe that episodic memory is memory about happenings in particular places at particular times, the what, where, and when of an event (Tulving, 2002). It involves the recollection of visual imagery as well as the feeling of familiarity (Hassabis & Maguire, 2007).

Can You Remember Everything You Ever Did or Said?

Episodic memories are also called autobiographical memories. Let’s quickly test your autobiographical memory. What were you wearing exactly five years ago today? What did you eat for lunch on April 10, 2009? You probably find it difficult, if not impossible, to answer these questions. Can you remember every event you have experienced over the course of your life—meals, conversations, clothing choices, weather conditions, and so on? Most likely none of us could even come close to answering these questions; however, American actress Marilu Henner, best known for the television show *Taxi*, can remember. She has an amazing and highly superior autobiographical memory.



Marilu Henner’s super autobiographical memory is known as hyperthymesia. (credit: Mark Richardson)

Very few people can recall events in this way; right now, only 12 known individuals have this ability, and only

a few have been studied (Parker, Cahill & McGaugh 2006). And although hyperthymesia normally appears in adolescence, two children in the United States appear to have memories from well before their tenth birthdays.

Watch the video clip on superior autobiographical memory from the television news show *60 Minutes*: [Endless Memory, Part 1](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=501#oembed-1>

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=501#h5p-143>

The Structure of LTM: Categories, Prototypes, and Schemas

Memories that are stored in LTM are not isolated but rather are linked together into **categories**—*networks of associated memories that have features in common with each other*. Forming categories, and using categories to guide behavior, is a fundamental part of human nature. Associated concepts within a category are connected through *spreading activation*, which occurs when activating one element of a category activates other associated elements. For instance, because tools are associated in a category, reminding people of the word

“screwdriver” will help them remember the word “wrench.” If they have just remembered the word “wrench,” they are more likely to remember the word “screwdriver” next than they are to remember the word “dahlia,” because the words are organized in memory by category and because “dahlia” is activated by spreading activation from “wrench” (Srull & Wyer, 1989).

Some categories have *defining features* that must be true of all members of the category. For instance, all members of the category “triangles” have three sides, and all members of the category “birds” lay eggs. But most categories are not so well-defined; the members of the category share some common features, but it is impossible to define which are or are not members of the category. For instance, there is no clear definition of the category “tool.” Some examples of the category, such as a hammer and a wrench, are clearly and easily identified as category members, whereas other members are not so obvious. Is an ironing board a tool? What about a car?

Members of categories (even those with defining features) can be compared to the category **prototype**, which is *the member of the category that is most average or typical of the category*. Some category members are more prototypical of, or similar to, the category than others. For instance, some category members (robins and sparrows) are highly prototypical of the category “birds,” whereas other category members (penguins and ostriches) are less prototypical. We retrieve information that is prototypical of a category faster than we retrieve information that is less prototypical (Rosch, 1975).



Category members vary in terms of their prototypicality. Some cats are “better” members of the category than others.

Mental categories are sometimes referred to as **schemas**—*patterns of knowledge in long-term memory that help us organize information*. We have schemas about objects (that a triangle has three sides and may take on different angles), about people (that Sam is friendly, likes to golf, and always wears sandals), about events (the particular steps involved in ordering a meal at a restaurant), and about social groups (we call these group schemas *stereotypes*).



Our schemas about people, couples, and events help us organize and remember information

Schemas are important in part because they help us remember new information by providing an organizational structure for it. Read the following paragraph (Bransford & Johnson, 1972) and then try to write down everything you can remember.

“The procedure is actually quite simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to a lack of facilities, that is the next step; otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run, this may not seem important, but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed, one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life.”

It turns out that people’s memory for this information is quite poor, unless they have been told ahead of time that the information describes “doing the laundry,” in which case their memory for the material is much better.

This demonstration of the role of schemas in memory shows how our existing knowledge can help us organize new information, and how this organization can improve encoding, storage, and retrieval.

Retrieval

So you have worked hard to encode (via effortful processing) and store some important information for your upcoming final exam. How do you get that information back out of storage when you need it? The act of getting information out of memory storage and back into conscious awareness is known as retrieval. This would be similar to finding and opening a paper you had previously saved on your computer's hard drive. Now it's back on your desktop, and you can work with it again. Our ability to retrieve information from long-term memory is vital to our everyday functioning. You must be able to retrieve information from memory in order to do everything, from knowing how to brush your hair and teeth, to driving to work, to knowing how to perform your job once you get there.

There are three ways you can retrieve information from your long-term memory storage system: recall, recognition, and relearning. **Recall** is what we most often think about when we talk about memory retrieval: it means you can access information without cues. For example, you would use recall for an essay test. Recognition happens when you identify information that you have previously learned after encountering it again. It involves a process of comparison. When you take a multiple-choice test, you are relying on recognition to help you choose the correct answer. Here is another example. Let's say you graduated from high school 10 years ago, and you have returned to your hometown for your 10-year reunion. You may not be able to recall all of your classmates, but you may recognize many of them based on their yearbook photos.

The third form of retrieval is **relearning**, and it's just what it sounds like. *It involves learning information that you previously learned.* Whitney took Spanish in high school, but after high school she did not have the opportunity to speak Spanish. Whitney is now 31, and her company has offered her an opportunity to work in their Mexico City office. In order to prepare herself, she enrolls in a Spanish course at the local community center. She's surprised at how quickly she's able to pick up the language after not speaking it for 13 years; this is an example of relearning.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it



online here:

<https://louis.pressbooks.pub/intropsychology/?p=501#h5p-144>

Critical Thinking Questions

Compare and contrast implicit and explicit memory.

Both are types of long-term memory. Explicit memories are memories we consciously try to remember and recall. Explicit memory is also called declarative memory and is subdivided into episodic memory (life events) and semantic memory (words, ideas, and concepts). Implicit memories are memories that are not part of our consciousness; they are memories formed from behaviors. Implicit memory is also called non-declarative memory and includes procedural memory as well as things learned through classical conditioning.

According to the Atkinson-Shiffrin model, name and describe the three stages of memory.

According to the Atkinson-Shiffrin model, memory is processed in three stages. The first is sensory memory; this is very brief: 1–2 seconds. Anything not attended to is ignored. The stimuli we pay attention to then move into our short-term memory. Short-term memory can hold approximately 7 bits of information for around 20 seconds. Information here is either forgotten, or it is encoded into long-term memory through the process of rehearsal. Long-term memory is the permanent storage of information—its capacity is basically unlimited.

Compare and contrast the two ways in which we encode information.

Information is encoded through automatic or effortful processing. Automatic processing refers to all information that enters long-term memory without conscious effort. This includes things such as time, space, and frequency—for example, your ability to remember what you ate for breakfast today or the fact that you remember that you ran into your best friend in the

supermarket twice this week. Effortful processing refers to encoding information through conscious attention and effort. Material that you study for a test requires effortful processing.

Personal Application Questions

Describe something you have learned that is now in your procedural memory. Discuss how you learned this information.

Describe something you learned in high school that is now in your semantic memory.

Summary

Memory is a system or process that stores what we learn for future use.

Our memory has three basic functions: encoding, storing, and retrieving information. Encoding is the act of getting information into our memory system through automatic or effortful processing. Storage is the retention of information, and **retrieval** *is the act of getting information out of storage and into conscious awareness through recall, recognition, and relearning*. The idea that information is processed through three memory systems is called the Atkinson-Shiffrin (A-S) model of memory. First, environmental stimuli enter our sensory memory for a period of less than a second to a few seconds. Those stimuli that we notice and pay attention to then move into short-term memory (also called working memory). According to the A-S model, if we rehearse this information, then it moves into long-term memory for permanent storage. Other models like that of Baddeley and Hitch suggest there is more of a feedback loop between short-term memory and long-term memory. Long-term memory has a practically limitless storage capacity and is divided into implicit and explicit memory. Finally, retrieval is the act of getting memories out of storage and back into conscious awareness. This is done through recall, recognition, and relearning.

44.

PARTS OF THE BRAIN INVOLVED WITH MEMORY

Learning Objectives

By the end of this section, you will be able to:

- Explain the brain functions involved in memory
- Recognize the roles of the hippocampus, amygdala, and cerebellum

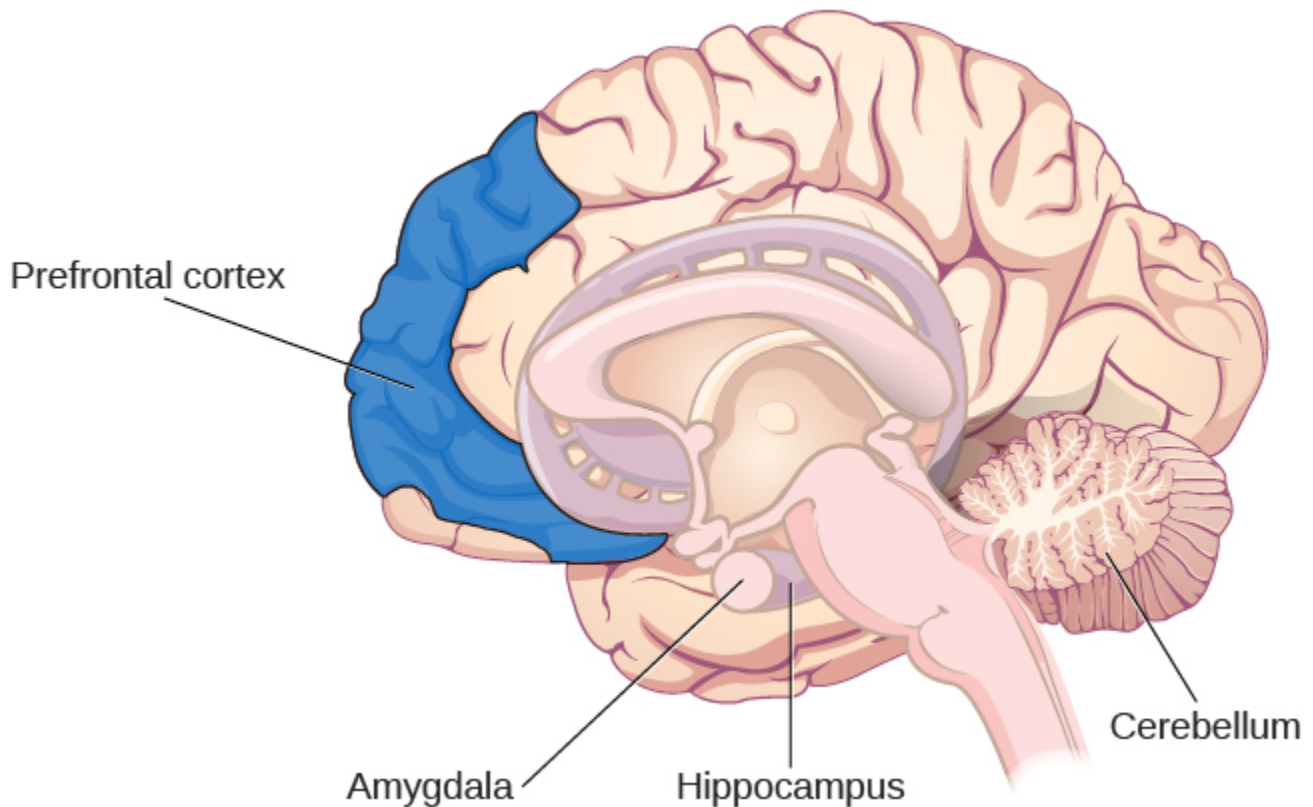
Are memories stored in just one part of the brain, or are they stored in many different parts of the brain? Karl Lashley began exploring this problem, about 100 years ago, by making lesions in the brains of animals such as rats and monkeys. He was searching for evidence of the **engram**: *the group of neurons that serve as the “physical representation of memory”* (Josselyn, 2010). First, Lashley (1950) trained rats to find their way through a maze. Then, he used the tools available at the time—in this case a soldering iron—to create lesions in the rats’ brains, specifically in the cerebral cortex. He did this because he was trying to erase the engram, or the original memory trace that the rats had of the maze.

Lashley did not find evidence of the engram, and the rats were still able to find their way through the maze, regardless of the size or location of the lesion. Based on his creation of lesions and the animals’ reaction, he formulated the **equipotentiality hypothesis**: *if part of one area of the brain involved in memory is damaged, another part of the same area can take over that memory function* (Lashley, 1950). Although Lashley’s early work did not confirm the existence of the engram, modern psychologists are making progress locating it. Eric Kandel, for example, spent decades working on the synapse, the basic structure of the brain, and its role in controlling the flow of information through neural circuits needed to store memories (Mayford, Siegelbaum, & Kandel, 2012).

Many scientists believe that the entire brain is involved with memory. However, since Lashley’s research, other scientists have been able to look more closely at the brain and memory. They have argued that memory

is located in specific parts of the brain, and specific neurons can be recognized for their involvement in forming memories. The main parts of the brain involved with memory are the amygdala, the hippocampus, the cerebellum, and the prefrontal cortex.

The amygdala is involved in fear and fear memories. The hippocampus is associated with declarative and episodic memory as well as recognition memory. The cerebellum plays a role in processing procedural memories, such as how to play the piano. The prefrontal cortex appears to be involved in remembering semantic tasks.



The main parts of the brain involved with memory are the amygdala, the hippocampus, the cerebellum, and the prefrontal cortex.

The Amygdala

First, let's look at the role of the amygdala in memory formation. The main job of the amygdala is to regulate emotions, such as fear and aggression. The amygdala plays a part in how memories are stored because storage is influenced by stress hormones. For example, one researcher experimented with rats and the fear response (Josselyn, 2010). Using Pavlovian conditioning, a neutral tone was paired with a foot shock to the rats. This produced a fear memory in the rats. After being conditioned, each time they heard the tone, they would freeze (a defense response in rats), indicating a memory of the impending shock. Then the researchers induced cell

death in neurons in the lateral amygdala, which is the specific area of the brain responsible for fear memories. They found the fear memory faded (became extinct). Because of its role in processing emotional information, the amygdala is also involved in memory consolidation: the process of transferring new learning into long-term memory. The amygdala seems to facilitate encoding memories at a deeper level when the event is emotionally arousing.

In this TED Talk called “A Mouse. A Laser Beam. A Manipulated Memory,” Steve Ramirez and Xu Liu from MIT talk about using laser beams to manipulate fear memory in rats. Find out why their work caused a media frenzy once it was published in *Science*: [A Mouse. A Laser Beam. A Manipulated Memory](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=503#oembed-1>

The Hippocampus

Another group of researchers also experimented with rats to learn how the hippocampus functions in memory processing. They created lesions in the hippocampi of the rats, and found that the rats demonstrated memory impairment on various tasks, such as object recognition and maze running. They concluded that the hippocampus is involved in memory, specifically normal recognition memory as well as spatial memory (when the memory tasks are like recall tests) (Clark, Zola, & Squire, 2000). Another job of the hippocampus is to project information to cortical regions that give memories meaning and connect them with other connected

memories. It also plays a part in memory consolidation: the process of transferring new learning into long-term memory.

Injury to this area leaves us unable to process new declarative memories. One famous patient, known for years only as H. M., had both his left and right temporal lobes (hippocampi) removed in an attempt to help control the seizures he had been suffering from for years (Corkin, Amaral, González, Johnson, & Hyman, 1997). As a result, his declarative memory was significantly affected, and he could not form new semantic knowledge. He lost the ability to form new memories, yet he could still remember information and events that had occurred prior to the surgery.

For a closer look at how memory works, view this video on quirks of memory: [How does your memory work? | Head Squeeze](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=503#oembed-2>

The Cerebellum and Prefrontal Cortex

Although the hippocampus seems to be more of a processing area for explicit memories, you could still lose it and be able to create implicit memories (procedural memory, motor learning, and classical conditioning) thanks to your cerebellum. For example, one classical conditioning experiment is to accustom subjects to blink when they are given a puff of air. When researchers damaged the cerebellums of rabbits, they discovered that the rabbits were not able to learn the conditioned eye-blink response (Steinmetz, 1999; Green & Woodruff-Pak, 2000).

Other researchers have used brain scans, including positron emission tomography (PET) scans, to learn how people process and retain information. From these studies, it seems the prefrontal cortex is involved. In one study, participants had to complete two different tasks: either looking for the letter *a* in words (considered a perceptual task) or categorizing a noun as either living or non-living (considered a semantic task) (Kapur et al., 1994). Participants were then asked which words they had previously seen. Recall was much better for the semantic task than for the perceptual task. According to PET scans, there was much more activation in the left inferior prefrontal cortex in the semantic task. In another study, encoding was associated with left frontal activity, while retrieval of information was associated with the right frontal region (Craik et al., 1999).

Neurotransmitters

There also appear to be specific neurotransmitters involved with the process of memory, such as epinephrine, dopamine, serotonin, glutamate, and acetylcholine (Myhrer, 2003). There continues to be discussion and debate among researchers as to which neurotransmitter plays which specific role (Blockland, 1996). Although we don't yet know which role each neurotransmitter plays in memory, we do know that communication among neurons via neurotransmitters is critical for developing new memories. Repeated activity by neurons leads to increased neurotransmitters in the synapses and more efficient and more synaptic connections. This is how memory consolidation occurs.

*It is also believed that strong emotions trigger the formation of strong memories, and weaker emotional experiences form weaker memories; this is called **arousal theory** (Christianson, 1992).* For example, strong emotional experiences can trigger the release of neurotransmitters, as well as hormones, which strengthen memory; therefore, our memory of an emotional event is usually better than our memory of a non-emotional event. When humans and animals are stressed, the brain secretes more of the neurotransmitter glutamate, which helps them remember the stressful event (McGaugh, 2003). This is clearly evidenced by what is known as the flashbulb memory phenomenon.

A **flashbulb memory** *is an exceptionally clear recollection of an important event.* Where were you when you first heard about the 9/11 terrorist attacks? Most likely you can remember where you were and what you were doing. In fact, a Pew Research Center (2011) survey found that for those Americans who were age 8 or older at the time of the event, 97% can recall the moment they learned of this event, even a decade after it happened.



Most people can remember where they were when they first heard about the 9/11 terrorist attacks. This is an example of a flashbulb memory: a record of an atypical and unusual event that has very strong emotional associations. (credit: Michael Foran)

Inaccurate and False Memories

Even flashbulb memories can have decreased accuracy with the passage of time, even with very important events. For example, on at least three occasions, when asked how he heard about the terrorist attacks of 9/11, President George W. Bush responded inaccurately. In January 2002, less than 4 months after the attacks, the then-sitting President Bush was asked how he heard about the attacks. He responded:

I was sitting there, and my Chief of Staff—well, first of all, when we walked into the classroom, I had seen this plane fly into the first building. There was a TV set on. And you know, I thought it was pilot error and I was amazed that anybody could make such a terrible mistake. (Greenberg, 2004, p. 2)

Contrary to what President Bush recalled, no one saw the first plane hit, except people on the ground near the twin towers. The first plane was not videotaped because it was a normal Tuesday morning in New York City, until the first plane hit.

Some people attributed Bush's wrong recall of the event to conspiracy theories. However, there is a much more benign explanation: human memory, even flashbulb memories, can be frail. In fact, memory can be so frail that we can convince a person an event happened to them, even when it did not. In studies, research participants will recall hearing a word, even though they never heard the word. For example, participants were

given a list of 15 sleep-related words, but the word “sleep” was not on the list. Participants recalled hearing the word “sleep” even though they did not actually hear it (Roediger & McDermott, 2000). The researchers who discovered this named the theory after themselves and a fellow researcher, calling it the Deese-Roediger-McDermott paradigm.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=503#h5p-146>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=503#h5p-147>

Critical Thinking Questions

What might happen to your memory system if you sustained damage to your hippocampus? Because your hippocampus seems to be more of a processing area for your explicit memories, injury to this area could leave you unable to process new declarative (explicit) memories; however, even with this loss, you would be able to create implicit memories (procedural memory, motor learning and classical conditioning).

Personal Application Questions

Describe a flashback memory of a significant event in your life.

Summary

Beginning with Karl Lashley, researchers and psychologists have been searching for the engram, which is the physical trace of memory. Lashley did not find the engram, but he did suggest that memories are distributed throughout the entire brain rather than stored in one specific area. Now we know that three brain areas do play significant roles in the processing and storage of different types of memories: cerebellum, hippocampus, and amygdala. The cerebellum's job is to process procedural memories; the hippocampus is where new memories are encoded; the amygdala helps determine what memories to store, and it plays a part in determining where the memories are stored based on whether we have a strong or weak emotional response to the event. Strong emotional experiences can trigger the release of neurotransmitters, as well as hormones, which strengthen memory, so that memory for an emotional event is usually stronger than memory for a non-emotional event. This is shown by what is known as the flashback memory phenomenon: our ability to remember significant life events. However, our memory for life events (autobiographical memory) is not always accurate.

45.

PROBLEMS WITH MEMORY

Learning Objectives

By the end of this section, you will be able to:

- Compare and contrast the two types of amnesia
- Discuss the unreliability of eyewitness testimony
- Discuss encoding failure
- Discuss the various memory errors
- Compare and contrast the two types of interference

You may pride yourself on your amazing ability to remember the birthdates and ages of all of your friends and family members, or you may be able to recall vivid details of your fifth birthday party at Chuck E. Cheese's. However, all of us have at times felt frustrated, and even embarrassed, when our memories have failed us. There are several reasons why this happens.

Amnesia

Amnesia is the loss of long-term memory that occurs as the result of disease, physical trauma, or psychological trauma. Psychologist Tulving (2002) and his colleagues at the University of Toronto studied K. C. for years. K. C. suffered a traumatic head injury in a motorcycle accident and then had severe amnesia. Tulving writes,

the outstanding fact about K.C.'s mental make-up is his utter inability to remember any events, circumstances, or situations from his own life. His episodic amnesia covers his whole life, from birth to the present. The only exception is the experiences that, at any time, he has had in the last minute or two. (Tulving, 2002, p. 14)

Anterograde Amnesia

There are two common types of amnesia: anterograde amnesia and retrograde amnesia. Anterograde amnesia is commonly caused by brain trauma, such as a blow to the head. With **anterograde amnesia**, *you cannot remember new information, although you can remember information and events that happened prior to your injury*. The hippocampus is usually affected (McLeod, 2011). This suggests that damage to the brain has resulted in the inability to transfer information from short-term to long-term memory; that is, the inability to consolidate memories.

Many people with this form of amnesia are unable to form new episodic or semantic memories, but are still able to form new procedural memories (Bayley & Squire, 2002). This was true of H. M., who was discussed earlier. The brain damage caused by his surgery resulted in anterograde amnesia. H. M. would read the same magazine over and over, having no memory of ever reading it—it was always new to him. He also could not remember people he had met after his surgery. If you were introduced to H. M. and then you left the room for a few minutes, he would not know you upon your return and would introduce himself to you again. However, when presented with the same puzzle several days in a row, although he did not remember having seen the puzzle before, his speed at solving it became faster each day (because of relearning) (Corkin, 1965, 1968). This diagram illustrates the timeline of retrograde and anterograde amnesia. *Memory problems that extend back in time before the injury and prevent retrieval of information previously stored in long-term memory are known as **retrograde amnesia***. Conversely, memory problems that extend forward in time from the point of injury and prevent the formation of new memories are called anterograde amnesia.



Timeline of retrograde and anterograde amnesia

Retrograde Amnesia

Retrograde amnesia is a loss of memory for events that occurred prior to the trauma. People with retrograde amnesia cannot remember some or even all of their past. They have difficulty remembering episodic memories. What if you woke up in the hospital one day and there were people surrounding your bed claiming to be your spouse, your children, and your parents? The trouble is you don't recognize any of them. You were in a car accident, suffered a head injury, and now have retrograde amnesia. You don't remember anything about your

life prior to waking up in the hospital. This may sound like the stuff of Hollywood movies, and Hollywood has been fascinated with the amnesia plot for nearly a century, going all the way back to the film *Garden of Lies* from 1915 to more recent movies such as the Jason Bourne spy thrillers. However, for real-life sufferers of retrograde amnesia, like former NFL football player Scott Bolzan, the story is not a Hollywood movie. Bolzan fell, hit his head, and deleted 46 years of his life in an instant. He is now living with one of the most extreme cases of retrograde amnesia on record.

View the video story profiling Scott Bolzan's amnesia and his attempts to get his life back: [Scott Bolzan – My Life Was Deleted](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=505#oembed-1>

Memory Construction and Reconstruction

*The formulation of new memories is sometimes called **construction**, and the process of bringing up old memories is called **reconstruction**.* Yet as we retrieve our memories, we also tend to alter and modify them. A memory pulled from long-term storage into short-term memory is flexible. New events can be added and we can change what we think we remember about past events, resulting in inaccuracies and distortions. People may not intend to distort facts, but it can happen in the process of retrieving old memories and combining them with new memories (Roediger and DeSoto, in press).

Suggestibility

When someone witnesses a crime, that person's memory of the details of the crime is very important in catching the suspect. Because memory is so fragile, witnesses can be easily (and often accidentally) misled due to the problem of suggestibility. **Suggestibility** *describes the effects of misinformation from external sources that leads to the creation of false memories.* In the fall of 2002, a sniper in the DC area shot people at a gas station, leaving Home Depot, and walking down the street. These attacks went on in a variety of places for over three weeks and resulted in the deaths of ten people. During this time, as you can imagine, people were terrified to

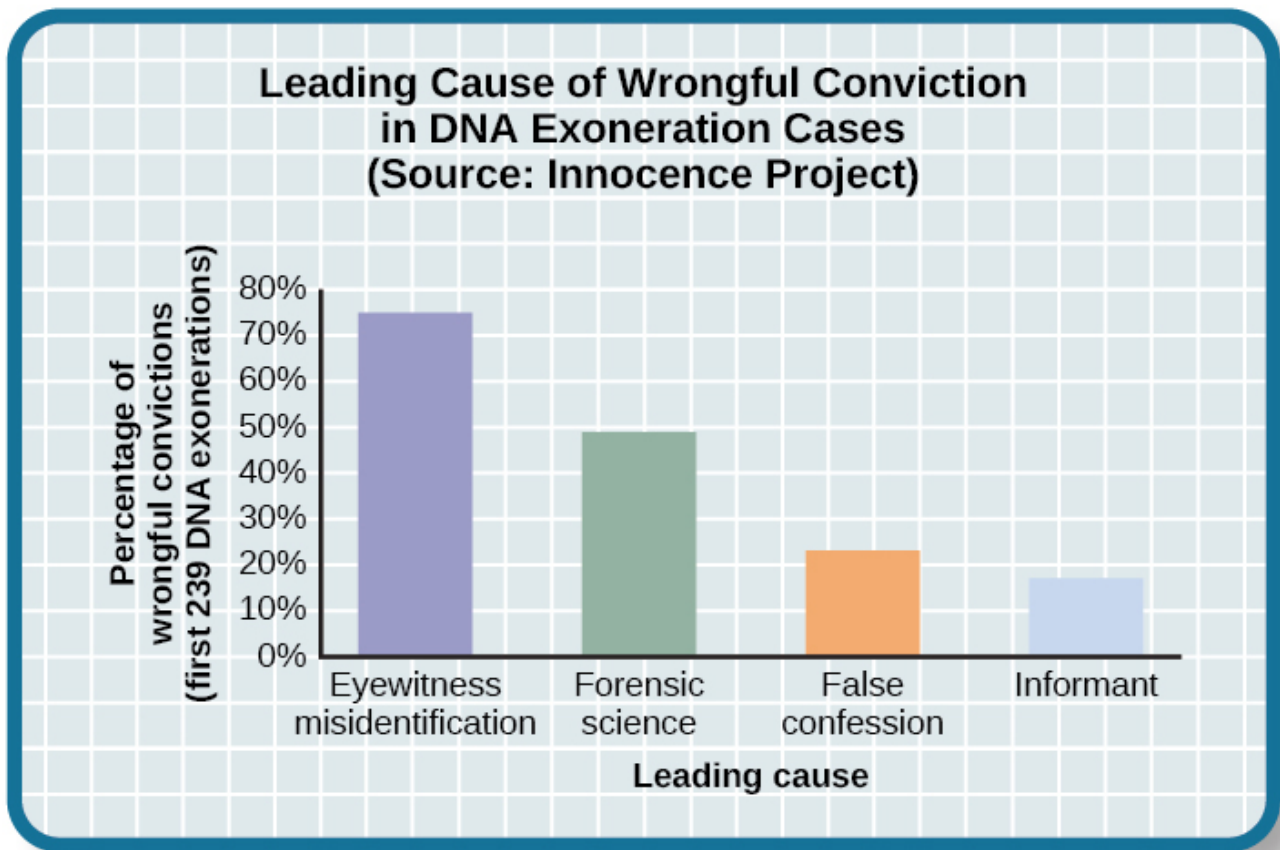
leave their homes, go shopping, or even walk through their neighborhoods. Police officers and the FBI worked frantically to solve the crimes, and a tip hotline was set up. Law enforcement received over 140,000 tips, which resulted in approximately 35,000 possible suspects (Newseum, n.d.).

Most of the tips were dead ends, until a white van was spotted at the site of one of the shootings. The police chief went on national television with a picture of the white van. After the news conference, several other eyewitnesses called to say that they too had seen a white van fleeing from the scene of the shooting. At the time, there were more than 70,000 white vans in the area. Police officers, as well as the general public, focused almost exclusively on white vans because they believed the eyewitnesses. Other tips were ignored. When the suspects were finally caught, they were driving a blue sedan.

As illustrated by this example, we are vulnerable to the power of suggestion, simply based on something we see on the news. Or we can claim to remember something that in fact is only a suggestion someone made. It is the suggestion that is the cause of the false memory.

Eyewitness Misidentification

Even though memory and the process of reconstruction can be fragile, police officers, prosecutors, and the courts often rely on eyewitness identification and testimony in the prosecution of criminals. However, faulty eyewitness identification and testimony can lead to wrongful convictions.



In studying cases where DNA evidence has exonerated people from crimes, the Innocence Project discovered that eyewitness misidentification is the leading cause of wrongful convictions (Benjamin N. Cardozo School of Law, Yeshiva University, 2009).

How does this happen? In 1984, Jennifer Thompson, then a 22-year-old college student in North Carolina, was brutally raped at knifepoint. As she was being raped, she tried to memorize every detail of her rapist's face and physical characteristics, vowing that if she survived, she would help get him convicted. After the police were contacted, a composite sketch was made of the suspect, and Jennifer was shown six photos. She chose two, one of which was of Ronald Cotton. After looking at the photos for 4–5 minutes, she said, "Yeah. This is the one," and then she added, "I think this is the guy." When questioned about this by the detective who asked, "You're sure? Positive?" She said that it was him. Then she asked the detective if she did OK, and he reinforced her choice by telling her she did great. These kinds of unintended cues and suggestions by police officers can lead witnesses to identify the wrong suspect. The district attorney was concerned about her lack of certainty the first time, so she viewed a lineup of seven men. She said she was trying to decide between numbers 4 and 5, finally deciding that Cotton, number 5, "Looks most like him." He was 22 years old.

By the time the trial began, Jennifer Thompson had absolutely no doubt that she was raped by Ronald Cotton. She testified at the court hearing, and her testimony was compelling enough that it helped convict him. How did she go from "I think it's the guy" and it "Looks most like him" to such certainty? Gary Wells

and Deah Quinlivan (2009) assert its suggestive police identification procedures, such as stacking lineups to make the defendant stand out, telling the witness which person to identify, and confirming witnesses' choices by telling them "Good choice," or "You picked the guy."

After Cotton was convicted of the rape, he was sent to prison for life plus 50 years. After 4 years in prison, he was able to get a new trial. Jennifer Thompson once again testified against him. This time Ronald Cotton was given two life sentences. After serving 11 years in prison, DNA evidence finally demonstrated that Ronald Cotton did not commit the rape, was innocent, and had served over a decade in prison for a crime he did not commit.

Ronald Cotton's story, unfortunately, is not unique. There are also people who were convicted and placed on death row who were later exonerated. The Innocence Project is a non-profit group that works to exonerate falsely convicted people, including those convicted by eyewitness testimony. To learn more, you can visit <http://www.innocenceproject.org>.

Preserving Eyewitness Memory: The Elizabeth Smart Case

Contrast the Cotton case with what happened in the Elizabeth Smart case. When Elizabeth was 14 years old and fast asleep in her bed at home, she was abducted at knifepoint. Her 9-year-old sister, Mary Katherine, was sleeping in the same bed and watched, terrified, as her beloved older sister was abducted. Mary Katherine was the sole eyewitness to this crime and was very fearful. In the coming weeks, the Salt Lake City police and the FBI proceeded with caution with Mary Katherine. They did not want to implant any false memories or mislead her in any way. They did not show her police line-ups or push her to do a composite sketch of the abductor. They knew if they corrupted her memory, Elizabeth might never be found. For several months, there was little or no progress on the case. Then, about 4 months after the kidnapping, Mary Katherine first recalled that she had heard the abductor's voice prior to that night (he had worked one time as a handyman at the family's home) and then she was able to name the person whose voice it was. The family contacted the press and others recognized him—after a total of 9 months, the suspect was caught and Elizabeth Smart was returned to her family.

The Misinformation Effect

Cognitive psychologist Elizabeth Loftus has conducted extensive research on memory. She has studied false memories as well as recovered memories of childhood sexual abuse. Loftus also developed the **misinformation effect paradigm**, *which holds that after exposure to incorrect information, a person may misremember the original event.*

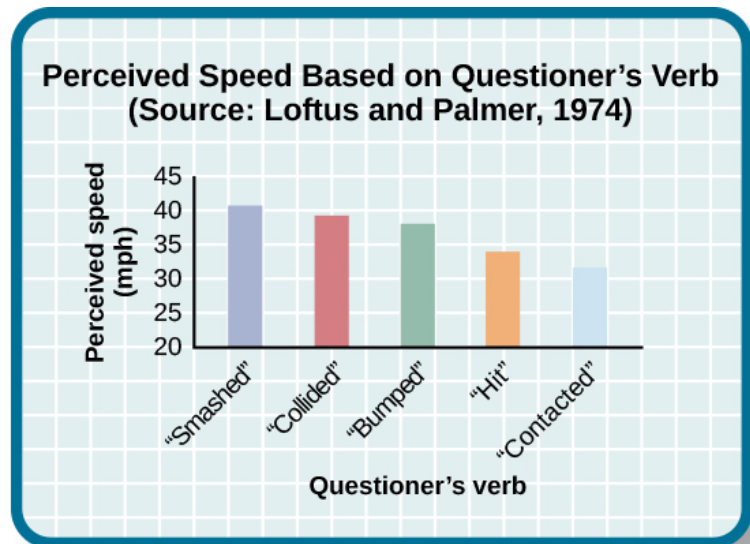
According to Loftus, an eyewitness's memory of an event is very flexible due to the misinformation effect.

To test this theory, Loftus and John Palmer (1974) asked 45 U.S. college students to estimate the speed of cars using different forms of questions. The participants were shown films of car accidents and were asked to play the role of the eyewitness and describe what happened. They were asked, “About how fast were the cars going when they (smashed, collided, bumped, hit, contacted) each other?” The participants estimated the speed of the cars based on the verb used.

Participants who heard the word “smashed” estimated that the cars were traveling at a much higher speed than participants who heard the word “contacted.” The implied information about speed, based on the verb they heard, had an effect on the participants’ memory of the accident. In a follow-up one week later, participants were asked if they saw any broken glass (none was shown in the accident pictures). Participants who had been in the “smashed” group were more than twice as likely to indicate that they did remember seeing glass. Loftus and Palmer demonstrated that a leading question encouraged them to not only remember the cars were going faster, but to also falsely remember that they saw broken glass.



(a)



(b)

When people are asked leading questions about an event, their memory of the event may be altered.
(credit a: modification of work by Rob Young)

Controversies over Repressed and Recovered Memories

Other researchers have described how whole events, not just words, can be falsely recalled, even when they did not happen. The idea that memories of traumatic events could be repressed has been a theme in the field of psychology, beginning with Sigmund Freud, and the controversy surrounding the idea continues today.

*Recall of false autobiographical memories is called **false memory syndrome**.* This syndrome has received a lot of publicity, particularly as it relates to memories of events that do not have independent witnesses—often the only witnesses to the abuse are the perpetrator and the victim (e.g., sexual abuse).

On one side of the debate are those who have recovered memories of childhood abuse years after it occurred.

These researchers argue that some children's experiences have been so traumatizing and distressing that they must lock those memories away in order to lead some semblance of a normal life. They believe that repressed memories can be locked away for decades and later recalled intact through hypnosis and guided imagery techniques (Deville, 2007).

Research suggests that having no memory of childhood sexual abuse is quite common in adults. For instance, one large-scale study conducted by John Briere and Jon Conte (1993) revealed that 59% of 450 men and women who were receiving treatment for sexual abuse that had occurred before age 18 had forgotten their experiences. Ross Cheit (2007) suggested that repressing these memories created psychological distress in adulthood. The Recovered Memory Project was created so that victims of childhood sexual abuse can recall these memories and allow the healing process to begin (Cheit, 2007; Devilly, 2007).

On the other side, Loftus has challenged the idea that individuals can repress memories of traumatic events from childhood, including sexual abuse, and then recover those memories years later through therapeutic techniques such as hypnosis, guided visualization, and age regression.

Loftus is not saying that childhood sexual abuse doesn't happen, but she does question whether or not those memories are accurate, and she is skeptical of the questioning process used to access these memories, given that even the slightest suggestion from the therapist can lead to misinformation effects. For example, researchers Stephen Ceci and Maggie Brucks (1993, 1995) asked three-year-old children to use an anatomically correct doll to show where their pediatricians had touched them during an exam. Fifty-five percent of the children pointed to the genital/anal area on the dolls, even when they had not received any form of genital exam.

Ever since Loftus published her first studies on the suggestibility of eyewitness testimony in the 1970s, social scientists, police officers, therapists, and legal practitioners have been aware of the flaws in interview practices. Consequently, steps have been taken to decrease the suggestibility of witnesses. One way is to modify how witnesses are questioned. When interviewers use neutral and less leading language, children more accurately recall what happened and who was involved (Goodman, 2006; Pipe, 1996; Pipe, Lamb, Orbach, & Esplin, 2004). Another change is in how police lineups are conducted. It's recommended that a blind photo lineup be used. This way the person administering the lineup doesn't know which photo belongs to the suspect, minimizing the possibility of giving leading cues. Additionally, judges in some states now inform jurors about the possibility of misidentification. Judges can also suppress eyewitness testimony if they deem it unreliable.

Forgetting

"I've a grand memory for forgetting," quipped Robert Louis Stevenson. **Forgetting** *refers to the loss of information from long-term memory*. We all forget things, like a loved one's birthday, someone's name, or where we put our car keys. As you've come to see, memory is fragile, and forgetting can be frustrating and even embarrassing. But why do we forget? To answer this question, we will look at several perspectives on forgetting.

Encoding Failure

Sometimes memory loss happens before the actual memory process begins, which is encoding failure. We can't remember something if we never stored it in our memory in the first place. This would be like trying to find a book on your e-reader that you never actually purchased and downloaded. Often, in order to remember something, we must pay attention to the details and actively work to process the information (effortful encoding). Lots of times we don't do this. For instance, think of how many times in your life you've seen a penny. Can you accurately recall what the front of a U.S. penny looks like? When researchers Raymond Nickerson and Marilyn Adams (1979) asked this question, they found that most Americans don't know which one it is. The reason is most likely encoding failure. Most of us never encode the details of the penny. We only encode enough information to be able to distinguish it from other coins. If we don't encode the information, then it's not in our long-term memory, so we will not be able to remember it.



(a)



(b)



(c)



(d)

Can you tell which coin, (a), (b), (c), or (d), is the accurate depiction of a US nickel? The correct answer is (c).

Memory Errors

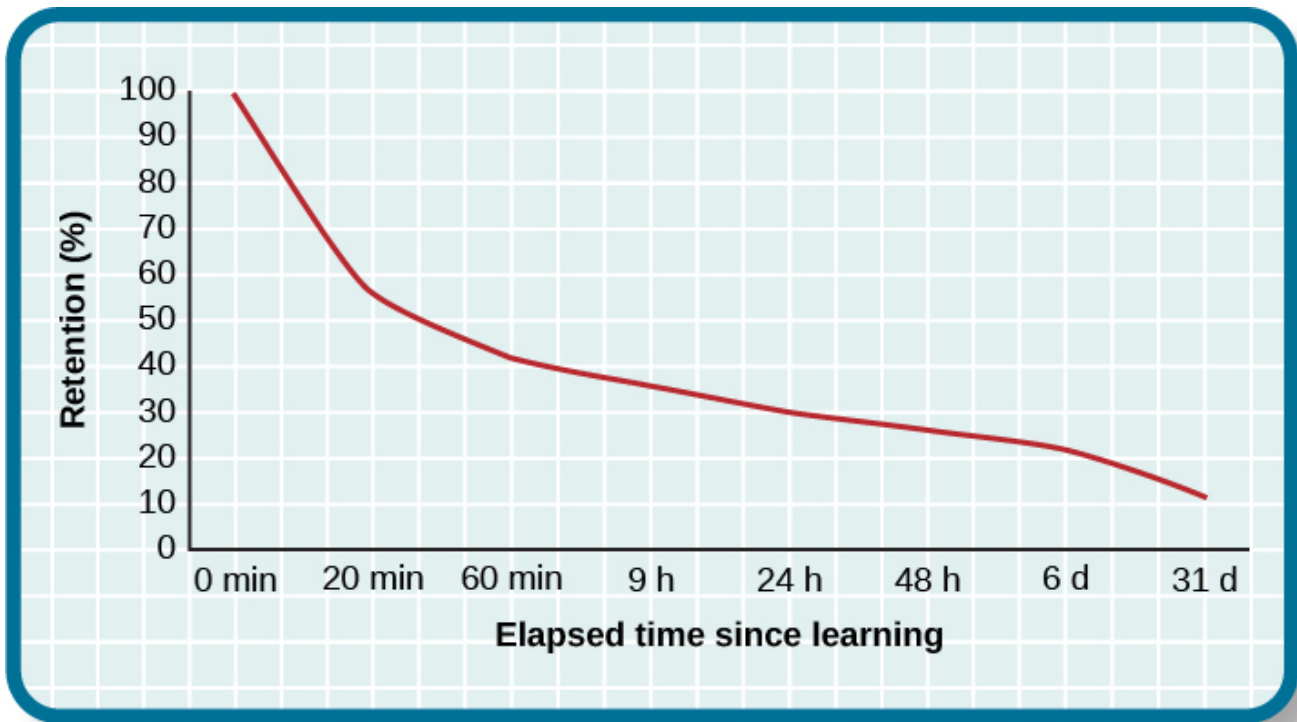
Psychologist Daniel Schacter (2001), a well-known memory researcher, offers seven ways our memories fail us. He calls them the seven sins of memory and categorizes them into three groups: forgetting, distortion, and intrusion.

Schacter's Seven Sins of Memory

Sin	Type	Description	Example
Transience	Forgetting	Accessibility of memory decreases over time	Forget events that occurred long ago
Absentmindedness	Forgetting	Forgetting caused by lapses in attention	Forget where your phone is
Blocking	Forgetting	Accessibility of information is temporarily blocked	Tip of the tongue
Misattribution	Distortion	Source of memory is confused	Recalling a dream memory as a waking memory
Suggestibility	Distortion	False memories	Result from leading questions
Bias	Distortion	Memories distorted by current belief system	Align memories to current beliefs
Persistence	Intrusion	Inability to forget undesirable memories	Traumatic events

Let's look at the first sin of the forgetting errors: **transience**, which means that memories can fade over time. Here's an example of how this happens. Nathan's English teacher has assigned his students to read the novel *To Kill a Mockingbird*. Nathan comes home from school and tells his mom he has to read this book for class. "Oh, I loved that book!" she says. Nathan asks her what the book is about, and after some hesitation, she says, "Well . . . I know I read the book in high school, and I remember that one of the main characters is named Scout, and her father is an attorney, but I honestly don't remember anything else." Nathan wonders if his mother actually read the book, and his mother is surprised she can't recall the plot. What is going on here is storage decay: unused information tends to fade with the passage of time.

In 1885, German psychologist Hermann Ebbinghaus analyzed the process of memorization. First, he memorized lists of nonsense syllables. Then he measured how much he learned (retained) when he attempted to relearn each list. He tested himself over different periods of time from 20 minutes later to 30 days later. The result is his famous forgetting curve. Due to storage decay, an average person will lose 50% of the memorized information after 20 minutes and 70% of the information after 24 hours (Ebbinghaus, 1885/1964). Your memory for new information decays quickly and then eventually levels out.



The Ebbinghaus forgetting curve shows how quickly memory for new information decays.

Are you constantly losing your cell phone? Have you ever driven back home to make sure you turned off the stove? Have you ever walked into a room for something, but forgotten what it was? You probably answered yes to at least one, if not all, of these examples—but don't worry, you are not alone. We are all prone to committing the memory error known as **absentmindedness**. These *lapses in memory are caused by breaks in attention or our focus being somewhere else*.

Cynthia, a psychologist, recalls a time when she recently committed the memory error of absentmindedness.

When I was completing court-ordered psychological evaluations, each time I went to the court, I was issued a temporary identification card with a magnetic strip which would open otherwise locked doors. As you can imagine, in a courtroom, this identification is valuable and important and no one wanted it to be lost or be picked up by a criminal. At the end of the day, I would hand in my temporary identification. One day, when I was almost done with an evaluation, my daughter's day care called and said she was sick and needed to be picked up. It was flu season, I didn't know how sick she was, and I was concerned. I finished up the evaluation in the next ten minutes, packed up my tools, and rushed to drive to my daughter's day care. After I picked up my daughter, I could not remember if I had handed back my identification or if I had left it sitting out on a table. I immediately called the court to check. It turned out that I had handed back my identification. Why could I not remember that? (personal communication, September 5, 2013)

When have you experienced absentmindedness?

"I just went and saw this movie called *Oblivion*, and it had that famous actor in it. Oh, what's his name? He's been in all of those movies, like *The Shawshank Redemption* and *The Dark Knight* trilogy. I think he's

even won an Oscar. Oh gosh, I can picture his face in my mind, and hear his distinctive voice, but I just can't think of his name! This is going to bug me until I can remember it!" This particular error can be so frustrating because you have the information right on the tip of your tongue. Have you ever experienced this? If so, you've committed the error known as blocking: you can't access stored information.



Blocking is also known as *tip-of-the-tongue (TOT) phenomenon*. The memory is right there, but you can't seem to recall it, just like not being able to remember the name of that very famous actor, Morgan Freeman. (credit: modification of work by D. Miller)

Now let's take a look at the three errors of distortion: misattribution, suggestibility, and bias. **Misattribution** happens when you confuse the source of your information. Let's say Alejandro was dating Lucia and they saw the first Hobbit movie together. Then they broke up and Alejandro saw the second Hobbit movie with someone else. Later that year, Alejandro and Lucia get back together. One day, they are discussing how the Hobbit books

and movies are different and Alejandro says to Lucia, “I loved watching the second movie with you and seeing you jump out of your seat during that super scary part.” When Lucia responded with a puzzled and then angry look, Alejandro realized he’d committed the error of misattribution.

What if someone is a victim of rape shortly after watching a television program? Is it possible that the victim could actually blame the rape on the person she saw on television because of misattribution? This is exactly what happened to Donald Thomson.

Australian eyewitness expert Donald Thomson appeared on a live TV discussion about the unreliability of eyewitness memory. He was later arrested, placed in a lineup and identified by a victim as the man who had raped her. The police charged Thomson although the rape had occurred at the time he was on TV. They dismissed his alibi that he was in plain view of a TV audience and in the company of the other discussants, including an assistant commissioner of police. . . . Eventually, the investigators discovered that the rapist had attacked the woman as she was watching TV—the very program on which Thomson had appeared. Authorities eventually cleared Thomson. The woman had confused the rapist’s face with the face that she had seen on TV. (Baddeley, 2004, p. 133)

The second distortion error is suggestibility. Suggestibility is similar to misattribution, since it also involves false memories, but it’s different. With misattribution you create the false memory entirely on your own, which is what the victim did in the Donald Thomson case above. With suggestibility, it comes from someone else, such as a therapist or police interviewer asking leading questions of a witness during an interview.

Memories can also be affected by **bias**, which is the final distortion error. Schacter (2001) says that *your feelings and view of the world can actually distort your memory of past events*. There are several types of bias.

Stereotypical bias involves racial and gender biases. For example, when Asian American and European American research participants were presented with a list of names, they more frequently incorrectly remembered typical African American names such as Jamal and Tyrone to be associated with the occupation basketball player, and they more frequently incorrectly remembered typical White names such as Greg and Howard to be associated with the occupation of politician (Payne, Jacoby, & Lambert, 2004).

Egocentric bias involves enhancing our memories of the past (Payne et al., 2004). Did you really score the winning goal in that big soccer match, or did you just assist?

Hindsight bias happens when we think an outcome was inevitable after the fact. This is the “I knew it all along” phenomenon. The reconstructive nature of memory contributes to hindsight bias (Carli, 1999). We remember untrue events that seem to confirm that we knew the outcome all along.

Have you ever had a song play over and over in your head? How about a memory of a traumatic event, something you really do not want to think about? *When you keep remembering something, to the point where you can’t “get it out of your head” and it interferes with your ability to concentrate on other things, it is called persistence*. It’s Schacter’s seventh and last memory error. It’s actually a failure of our memory system because we involuntarily recall unwanted memories, particularly unpleasant ones. For instance, you witness a

horrific car accident on the way to work one morning, and you can't concentrate on work because you keep remembering the scene.

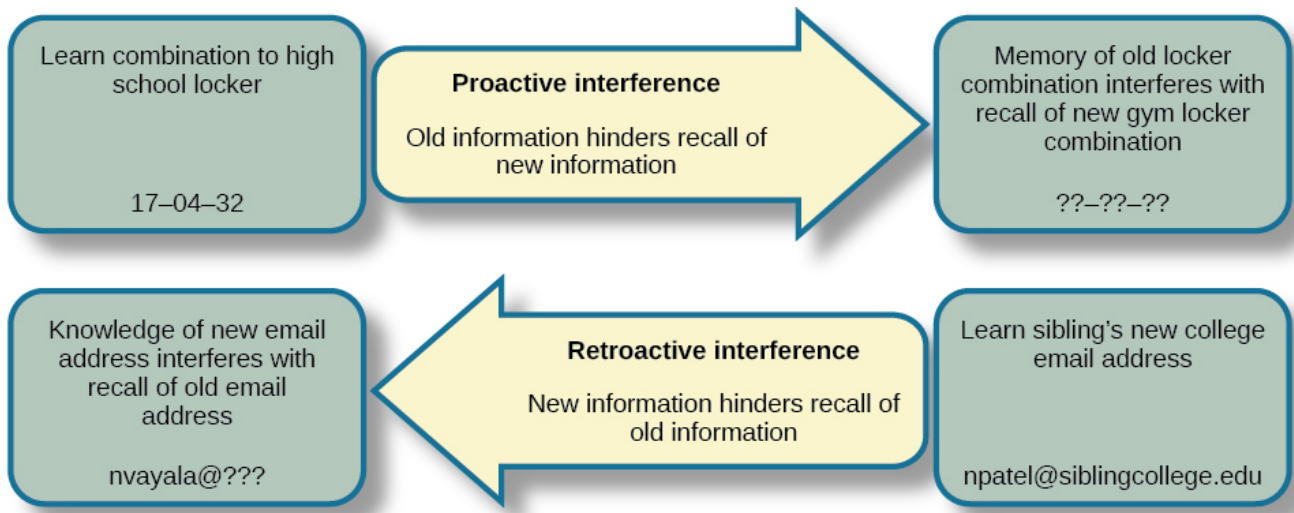


Many veterans of military conflicts involuntarily recall unwanted, unpleasant memories. (credit: Department of Defense photo by U.S. Air Force Tech. Sgt. Michael R. Holzworth)

Interference

Sometimes information is stored in our memory, but for some reason it is inaccessible. This is known as interference, and there are two types: proactive interference and retroactive interference. Have you ever gotten a new phone number or moved to a new address, but right after, you tell people the old (and wrong) phone number or address? When the new year starts, do you find you accidentally write the previous year? These are examples of **proactive interference**: *when old information hinders the recall of newly learned information*. **Retroactive interference** *happens when information learned more recently hinders the recall of older information*. For example, this week you are studying Freud's Psychoanalytic Theory. Next week you study the humanistic perspective of Maslow and Rogers. Thereafter, you have trouble remembering Freud's Psychosexual Stages of Development because you can only remember Maslow's Hierarchy of Needs.

Sometimes forgetting is caused by a failure to retrieve information. This can be due to interference, either retroactive or proactive.



Sometimes forgetting is caused by a failure to retrieve information. This can be due to interference, either retroactive or proactive.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=505#h5p-149>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=505#h5p-150>

Critical Thinking Questions

Compare and contrast the two types of interference.

There are two types of interference: retroactive and proactive. Both are types of forgetting caused by a failure to retrieve information. With retroactive interference, new information hinders the ability to recall older information. With proactive interference, it's the opposite: old information hinders the recall of newly learned information.

Compare and contrast the two types of amnesia.

There are two types of amnesia: retrograde and anterograde. Both involve the loss of long-term memory that occurs as the result of disease, physical trauma, or psychological trauma. With anterograde amnesia, you cannot remember new information; however, you can remember information and events that happened prior to your injury. Retrograde amnesia is the exact opposite: you experience loss of memory for events that occurred before the trauma.

Personal Application Questions

1. Which of the seven memory errors presented by Schacter have you committed? Provide an example of each one.

2. Jurors place a lot of weight on eyewitness testimony. Imagine you are an attorney representing a defendant who is accused of robbing a convenience store. Several eyewitnesses have been called to testify against your client. What would you tell the jurors about the reliability of eyewitness testimony?

Summary

All of us at times have felt dismayed, frustrated, and even embarrassed when our memories have failed us. Our memory is flexible and prone to many errors, which is why eyewitness testimony has been found to be largely unreliable. There are several reasons why forgetting occurs. In cases of brain trauma or disease, forgetting may be due to amnesia. Another reason we forget is due to encoding failure. We can't remember something if we never stored it in our memory in the first place. Schacter presents seven memory errors that also contribute to forgetting. Sometimes, information is actually stored in our memory, but we cannot access it due to interference. Proactive interference happens when old information hinders the recall of newly learned information. Retroactive interference happens when information learned more recently hinders the recall of older information.

46.

WAYS TO ENHANCE MEMORY

Learning Objectives

By the end of this section, you will be able to:

- Recognize and apply memory-enhancing strategies
- Recognize and apply effective study techniques

Most of us suffer from memory failures of one kind or another, and most of us would like to improve our memories so that we don't forget where we put the car keys or, more importantly, the material we need to know for an exam. In this section, we'll look at some ways to help you remember better, and at some strategies for more effective studying.

Memory-Enhancing Strategies

What are some everyday ways we can improve our memory, including recall? *To help make sure information goes from short-term memory to long-term memory, you can use **memory-enhancing strategies**.* One strategy is rehearsal, or the conscious repetition of information to be remembered (Craig & Watkins, 1973). Think about how you learned your multiplication tables as a child. You may recall that $6 \times 6 = 36$, $6 \times 7 = 42$, and $6 \times 8 = 48$. Memorizing these facts is rehearsal.

Another strategy is **chunking**: *you organize information into manageable bits or chunks* (Bodie, Powers, & Fitch-Hauser, 2006). Chunking is useful when trying to remember information like dates and phone numbers. Instead of trying to remember 5205550467, you remember the number as 520-555-0467. So, if you met an interesting person at a party and you wanted to remember his phone number, you would naturally chunk it, and you could repeat the number over and over, which is the rehearsal strategy.

Try this fun activity that employs a memory-enhancing strategy: [Letter Memorization Test](#)

You could also enhance memory by using elaborative rehearsal. **Elaborative rehearsal** is a technique in which you think about the meaning of the new information and its relation to knowledge already stored in your memory (Tigner, 1999). For example, in this case, you could remember that 520 is an area code for Arizona and the person you met is from Arizona. This would help you better remember the 520 prefix. If the information is retained, it goes into long-term memory.

Mnemonic devices are memory aids that help us organize information for encoding. They are especially useful when we want to recall larger bits of information such as steps, stages, phases, and parts of a system (Bellezza, 1981). Brian needs to learn the order of the planets in the solar system, but he's having a hard time remembering the correct order. His friend Kelly suggests a mnemonic device that can help him remember. Kelly tells Brian to simply remember the name Mr. VEM J. SUN, and he can easily recall the correct order of the planets: **M**ercury, **V**enus, **E**arth, **M**ars, **J**upiter, **S**aturn, **U**ranus, and **N**eptune. You might use a mnemonic device to help you remember someone's name, a mathematical formula, or the seven levels of Bloom's taxonomy.



This is a knuckle mnemonic to help you remember the number of days in each month. Months with 31 days are represented by the protruding knuckles and shorter months fall in the spots between knuckles. (credit: modification of work by Cory Zanker)

If you have ever watched the television show *Modern Family*, you might have seen Phil Dunphy explain how he remembers names:

The other day I met this guy named Carl. Now, I might forget that name, but he was wearing a Grateful Dead t-shirt. What's a band like the Grateful Dead? Phish. Where do fish live? The ocean. What else lives in the ocean? Coral. Hello, Co-arl. (Wrubel & Spiller, 2010)

It seems the more vivid or unusual the mnemonic, the easier it is to remember. The key to using any mnemonic successfully is to find a strategy that works for you.

Watch this fascinating TED Talks lecture titled “Feats of Memory Anyone Can Do.” The lecture is given by Joshua Foer, a science writer who “accidentally” won the U. S. Memory Championships. He explains a mnemonic device called the memory palace: [Feats of Memory Anyone Can Do](#).

Some other strategies that are used to improve memory include expressive writing and saying words aloud. Expressive writing helps boost your short-term memory, particularly if you write about a traumatic experience in your life. Masao Yogo and Shuji Fujihara (2008) had participants write for 20-minute intervals several times per month. The participants were instructed to write about a traumatic experience, their best possible future selves, or a trivial topic. The researchers found that this simple writing task increased short-term memory capacity after five weeks, but only for the participants who wrote about traumatic experiences. Psychologists can't explain why this writing task works, but it does.

What if you want to remember items you need to pick up at the store? Simply say them out loud to yourself. A series of studies (MacLeod, Gopie, Hourihan, Neary, & Ozubko, 2010) found that saying a word out loud improves your memory of the word because it increases the word's distinctiveness. Feel silly saying random grocery items aloud? This technique works equally well if you just mouth the words. Using these techniques increased participants' memory of the words by more than 10%. These techniques can also be used to help you study.

How to Study Effectively

Based on the information presented in this chapter, here are some strategies and suggestions to help you hone your study techniques. The key with any of these strategies is to figure out what works best for you.



Memory techniques can be useful when studying for class. (credit: Barry Pousman)

- **Use elaborative rehearsal:** In a famous article, Craik and Lockhart (1972) discussed their belief that information we process more deeply goes into long-term memory. Their theory is called **levels of processing**. *If we want to remember a piece of information, we should think about it more deeply and link it to other information and memories to make it more meaningful.* For example, if we are trying to remember that the hippocampus is involved with memory processing, we might envision a hippopotamus with excellent memory and then we could better remember the hippocampus.
- **Apply the self-reference effect:** As you go through the process of elaborative rehearsal, it would be even more beneficial to make the material you are trying to memorize personally meaningful to you. In other words, make use of the self-reference effect. Write notes in your own words. Write definitions from the text, and then rewrite them in your own words. Relate the material to something you have already learned for another class, or think how you can apply the concepts to your own life. When you do this, you are building a web of retrieval cues that will help you access the material when you want to remember it.
- **Don't forget the forgetting curve:** As you know, the information you learn drops off rapidly with time. Even if you think you know the material, study it again right before test time to increase the likelihood the information will remain in your memory. Overlearning can help prevent storage decay.
- **Rehearse, rehearse, rehearse:** Review the material over time, in spaced and organized study sessions. Organize and study your notes, and take practice quizzes/exams. Link the new information to other information you already know well.
- **Be aware of interference:** To reduce the likelihood of interference, study during a quiet time without interruptions or distractions (like television or music).
- **Keep moving:** Of course you already know that exercise is good for your body, but did you also know it's also good for your mind? Research suggests that regular aerobic exercise (anything that gets your heart rate elevated) is beneficial for memory (van Praag, 2008). Aerobic exercise promotes neurogenesis: the growth of new brain cells in the hippocampus, an area of the brain known to play a role in memory and learning.
- **Get enough sleep:** While you are sleeping, your brain is still at work. During sleep the brain organizes and consolidates information to be stored in long-term memory (Abel & Bäuml, 2013).
- **Make use of mnemonic devices:** As you learned earlier in this chapter, mnemonic devices often help us to remember and recall information. There are different types of mnemonic devices, such as the acronym. An acronym is a word formed by the first letter of each of the words you want to remember. For example, even if you live near one, you might have difficulty recalling the names of all five Great Lakes. What if I told you to think of the word HOMES? HOMES is an acronym that represents Huron, Ontario, Michigan, Erie, and Superior: the five Great Lakes. Another type of mnemonic device is an acrostic: you make a phrase of all the first letters of the words. For example, if you are taking a math test and you are having difficulty remembering *the order of operations*, recalling the following sentence will help you: "Please Excuse My Dear Aunt Sally," because the order of mathematical operations is

Parentheses, Exponents, Multiplication, Division, Addition, Subtraction. There also are jingles, which are rhyming tunes that contain key words related to the concept, such as *i before e, except after c*.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=507#h5p-152>

Critical Thinking Questions

What is the self-reference effect, and how can it help you study more effectively?

The self-reference effect is the tendency of an individual to have better memory for information that relates to oneself than information that is not personally relevant. You can use the self-reference effect to relate the material to something you have already learned for another class, or think how you can apply the concepts to your life. When you do this, you are building a web of retrieval cues that will help you access the material when you want to remember it.

You and your roommate spent all of last night studying for your psychology test. You think you know the material; however, you suggest that you study again the next morning an hour prior to the test. Your roommate asks you to explain why you think this is a good idea. What do you tell her?

You remind her about Ebbinghaus's forgetting curve: the information you learn drops off rapidly with time. Even if you think you know the material, you should study it again right before test time to increase the likelihood the information will remain in your memory. Overlearning can help prevent storage decay.

Personal Application Questions

Create a mnemonic device to help you remember a term or concept from this chapter.

What is an effective study technique that you have used? How is it similar to/different from the strategies suggested in this chapter.

Summary

There are many ways to combat the inevitable failures of our memory system. Some common strategies that can be used in everyday situations include mnemonic devices, rehearsal, self-referencing, and adequate sleep. These same strategies also can help you to study more effectively.

47.

REFERENCES

- Abel, M., & Bäuml, K.-H. T. (2013). Sleep can reduce proactive interference. *Memory*, 22(4), 332–339. doi:10.1080/09658211.2013.785570. Retrieved from http://www.psychologie.uni-regensburg.de/Baeuml/papers_in_press/sleepPI.pdf
- Anderson, N. S. (1969). The influence of acoustic similarity on serial recall of letter sequences. *Quarterly Journal of Experimental Psychology*, 21(3), 248–255.
- Anderson, R. C. (1984). Role of the reader's schema in comprehension, learning, and memory. In R. C. Anderson, J. Osborn, & R. J. Tierney (Eds.), *Learning to read in American schools: Basal Readers and Content Texts* (pp. 243–257). Hillsdale, NJ: Erlbaum.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation: Volume 2* (pp. 89–195). New York, NY: Academic Press.
- Baddeley, A. (2004). *Your memory: A user's guide*. Richmond Hill, Canada: Firefly Books.
- Baddeley, A. D., & Hitch, G. (1974). Working memory. In G. H. Bower (Ed.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 8, pp. 47–89). New York, NY: Academic Press.
- Bayley, P. J., & Squire, L. R. (2002). Medial temporal lobe amnesia: Gradual acquisition of factual information by nondeclarative memory. *Journal of Neuroscience*, 22, 5741–5748.
- Bellezza, F. S. (1981). Mnemonic devices: Classification, characteristics and criteria. *Review of Educational Research*, 51, 247–275.
- Benjamin N. Cardozo School of Law, Yeshiva University. (2009). Reevaluating lineups: Why witnesses make mistakes and how to reduce the chance of a misidentification. Retrieved from The Innocence Project website: http://www.innocenceproject.org/docs/Eyewitness_ID_Report.pdf
- Blockland, A. (1996). Acetylcholine: A neurotransmitter for learning and memory? *Brain Research Reviews*, 21, 285–300.
- Bodie, G. D., Powers, W. G., & Fitch-Hauser, M. (2006). Chunking, priming, and active learning: Toward an innovative approach to teaching communication-related skills. *Interactive Learning Environment*, 14(2), 119–135.
- Bousfield, W. (1935). The occurrence of clustering in the recall of randomly arranged associates. *Journal of General Psychology*, 49, 229–240.
- Bransford, J. D., & McCarrell, N. S. (1974). A sketch of a cognitive approach to comprehension. In W. B.

Weimer & D. J. Palermo (Eds.), *Cognition and the symbolic processes* (pp. 189–229). Hillsdale, NJ: Lawrence Erlbaum Associates.

Briere, J., & Conte, J. (1993). Self-reported amnesia for abuse in adults molested as children. *Journal of Traumatic Stress, 6*, 21–31.

Carli, L. (1999). Cognitive reconstruction, hindsight, and reactions to victims and perpetrators. *Personality and Social Psychology Bulletin, 25*(8), 966–979. doi:10.1177/01461672992511005

Ceci, S. J., & Bruck, M. (1993). Child witness: Translating research into policy. *Social Policy Report, 7*(3), 1–30.

Ceci, S. J., & Bruck, M. (1995). *Jeopardy in the courtroom: A scientific analysis of children's testimony*. Washington, DC: American Psychological Association.

Cheit, R. E. (2007). *The recovered memory project*. Retrieved from <http://blogs.brown.edu/recoveredmemory/>

Christianson, S. A. (1992). *The handbook of emotion and memory: Research and theory*. Hillsdale, NJ: Erlbaum.

Clark, R. E., Zola, S. M., & Squire, L. R. (2000). Impaired recognition memory in rats after damage to the hippocampus. *The Journal of Neuroscience, 20*(23), 8853–8860.

Corkin, S. (1965). Tactually-guided maze learning in man: Effects of unilateral cortical excisions and bilateral hippocampal lesions. *Neuropsychologia, 3*, 339–351.

Corkin, S. (1968). Acquisition of motor skill after bilateral medial temporal-lobe excision. *Neuropsychologia, 6*, 255–264.

Corkin, S., Amaral D. G., González, R. G., Johnson, K. A., & Hyman, B. T. (1997). H. M.'s medial temporal lobe lesion: Findings from magnetic resonance imaging. *Journal of Neuroscience, 17*(10), 3964–3979.

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior, 11*, 671–684.

Craik, F. I. M., Moroz, T. M., Moscovitch, M., Stuss, D. T., Winocur, G., Tulving, E., & Kapur, S. (1999). In search of the self: A positron emission tomography study. *Psychological Science, 10*(1), 26–34.

Craik, F. I. M., & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology, 104*(3), 268–294.

Craik, F. I. M., & Watkins, M. J. (1973). The role of rehearsal in short-term memory. *Journal of Verbal Learning and Verbal Behavior, 12*, 599–607.

Green, J. T., & Woodruff-Pak, D. S. (2000). Eyeblick classical conditioning in aging animals. In D. S. Woodruff-Pak & J. E. Steinmetz (Eds.), *Eyeblick classical conditioning: Animal models* (Vol. 2, pp.155–178). Boston, MA: Kluwer Academic.

Greenberg, D. L. (2004). President Bush's false [flashbulb] memory of 9/11/01. *Applied. Cognitive Psychology, 18*(3), 363–370. doi:10.1002/acp.1016

Deville, G. J. (2007). If nothing happened why do I still hurt? An update on the memory wars. *InPsych, 29*(2), 16–18.

- Ebbinghaus, H. (1964). *Memory: A contribution to experimental psychology* (H. A. Ruger & C. E. Bussenius, Trans.). New York, NY: Dover. (Original work published 1885)
- Goodman, G. S. (2006). Children's eyewitness memory: A modern history and contemporary commentary. *Journal of Social Issues*, 62, 811–832.
- Hassabis D., & Maguire E. A. (2007). Deconstructing episodic memory with construction. *Trends in Cognitive Sciences*, 11(7), 299–306.
- Jacobs, J. (1887). Experiments on “prehension.” *Mind*, 12, 75–79.
- Josselyn, J. A. (2010). Continuing the search for the engram: Examining the mechanism of fear memories. *Journal of Psychiatry Neuroscience*, 35(4), 221–228.
- Kapur, S., Craik, F. I. M., Tulving, E., Wilson, A. A., Houle, S., & Brown, G. M. (1994). Neuroanatomical correlates of encoding in episodic memory: Levels of processing effect. *Proceedings of the National Academy of Sciences of the United States of America*, 91(6), 208–211.
- Lashley K. S. (1950). In search of the engram. *Society of Experimental Biology Symposium*, 4: *Psychological Mechanisms in Animal Behavior*. Cambridge, UK: Cambridge University Press.
- Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of auto-mobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behavior*, 13, 585–589.
- MacLeod, C. M., Gopie, N., Hourihan, K. L., Neary, K. R., & Ozubko, J. D. (2010). The production effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 36(3), 671–685.
- Mayford, M., Siegelbaum, S. A., & Kandel, E. R. (2012). *Synapses and memory storage*. New York, NY: Cold Spring Harbor Perspectives in Biology, Cold Spring Harbor Laboratory Press.
- McGaugh, J. L. (2003). *Memory and emotion: The making of lasting memories*. New York, NY: Columbia University Press.
- McLeod, S. A. (2011). Anterograde amnesia [Web log post]. Retrieved from <http://www.simplypsychology.org/anterograde-amnesia.html>
- Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 68, 81–87.
- Myhrer, T. (2003). Neurotransmitter systems involved in learning and memory in the rat: A meta-analysis based on studies of four behavioral tasks. *Brain Research Reviews*, 41(2–3), 268–287.
- Newseum. (n.d.). G-men and journalists: D. C. sniper [Web log post]. Retrieved from <http://www.newseum.org/exhibits-and-theaters/temporary-exhibits/g-men-and-journalists/sniper/>
- Nickerson, R. S., & Adams, M. J. (1979). Long-term memory for a common object. *Cognitive Psychology*, 11(3), 287–307.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. New York, NY: Oxford University Press.
- Parker, E. S., Cahill, L., & McGaugh, J. L. (2006). A case of unusual autobiographical remembering. *Neurocase*, 12, 35–49.

- Payne, B. K., Jacoby, L. L., & Lambert, A. J. (2004). Memory monitoring and the control of stereotype distortion. *Journal of Experimental Social Psychology*, 40, 52–64.
- Pew Research Center. (2011, September 1). *Ten years after 9/11: United in remembrance, divided over policies*. Washington, DC: People Press.
- Pipe, M.-E. (1996). Children's eyewitness memory. *New Zealand Journal of Psychology*, 25(2), 36–43.
- Pipe, M.-E., Lamb, M., Orbach, Y., & Esplin, P. W. (2004). Recent research on children's testimony about experienced and witnessed events. *Developmental Review*, 24, 440–468.
- Roediger, H. L., & DeSoto, K. A. (in press). The psychology of reconstructive memory. In J. Wright (Ed.), *International Encyclopedia of the Social and Behavioral sciences*, 2e. Oxford, UK: Elsevier.
- Roediger, H. L., III, & McDermott, K. B. (2000). Tricks of memory. *Current Directions in Psychological Science*, 9, 123–127.
- Rogers, T. B., Kuiper, N. A., & Kirker, W. S. (1977). Self-reference and the encoding of personal information. *Journal of Personal Social Psychology*, 35(9), 677–688.
- Schacter, D. (2001). *The seven sins of memory: How the mind forgets and remembers*. New York, NY: Houghton Mifflin.
- Steinmetz, J. E. (1999). A renewed interest in human classical eyeblink conditioning. *Psychological Science*, 10, 24–25.
- Tigner, R. B. (1999). Putting memory research to good use. *College Teaching*, 47(4), 149–152.
- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Dolandson (Eds.), *Organization of memory* (pp. 381–403). New York, NY: Academic Press.
- Tulving, E. (2002, February). Episodic memory: From mind to brain. *Annual Review of Psychology*, 53, 1–25. doi:10.1146/annurev.psych.53.100901.135114
- van Praag, H. (2008). Neurogenesis and exercise: Past and future directions. *NeuroMolecular Medicine*, 10(2), 128–140.
- Wells, G. L., & Quinlivan, D. S. (2009). Suggestive eyewitness identification procedures and the Supreme Court's reliability test in light of eyewitness science: 30 years later. *Law and Human Behavior*, 33, 1–24. doi:10.1007/s10979-008-9130-3
- Wrubel, B. (Writer), & Spiller, M. (Director). (2010). The Old Wagon [Television series episode]. In S. Levitan & C. Lloyd (Executive producers), *Modern Family*. 20th Century Fox Television.
- Yogo, M., & Fujihara, S. (2008). Working memory capacity can be improved by expressive writing: A randomized experiment in a Japanese sample. *British Journal of Health Psychology*, 13(1), 77–80. doi:10.1348/135910707X252440

PART X

EMOTION AND MOTIVATION



Emotions can change in an instant, especially in response to an unexpected event. Surprise, fear, anger, and sadness are some immediate emotions that people experienced in the aftermath of the April 15, 2013, Boston Marathon bombing. What are emotions? What causes them? What motivated some bystanders to immediately help others, while other people ran for safety? (credit: modification of work by Aaron “tango” Tang)

What makes us behave as we do? What drives us to eat? What drives us toward sex? Is there a biological basis to explain the feelings we experience? How universal are emotions?

In this chapter, we will explore issues relating to both motivation and emotion. We will begin with a discussion of several theories that have been proposed to explain motivation and why we engage in a given behavior. You will learn about the physiological needs that drive some human behaviors, as well as the importance of our social experiences in influencing our actions.

Next, we will consider both eating and having sex as examples of motivated behaviors. What are the physiological mechanisms of hunger and satiety? What understanding do scientists have of why obesity occurs, and what treatments exist for obesity and eating disorders? How has research into human sex and sexuality evolved over the past century? How do psychologists understand and study the human experience of sexual orientation and gender identity? These questions—and more—will be explored.

This chapter will close with a discussion of emotion. You will learn about several theories that have been proposed to explain how emotion occurs, the biological underpinnings of emotion, and the universality of emotions.

48.

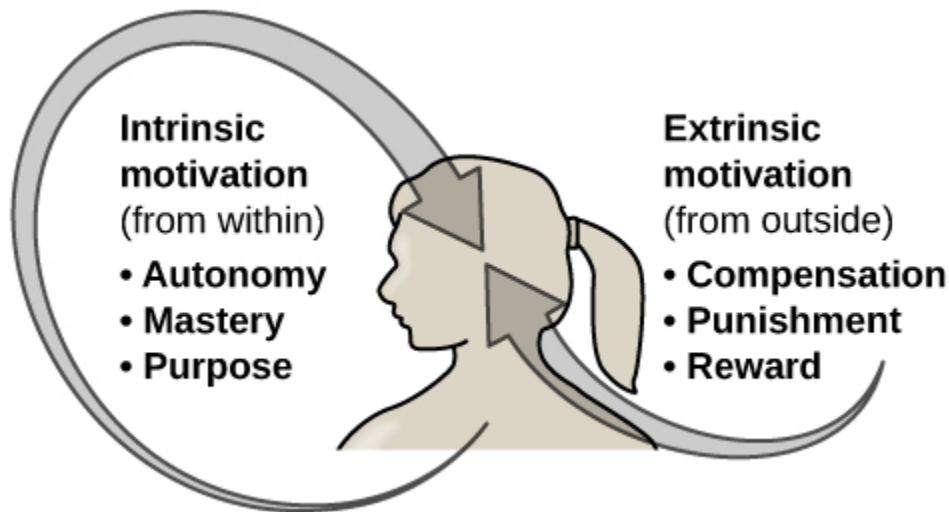
MOTIVATION

Learning Objectives

By the end of this section, you will be able to:

- Define intrinsic and extrinsic motivation
- Understand that instincts, drive reduction, self-efficacy, and social motives have all been proposed as theories of motivation
- Explain the basic concepts associated with Maslow's hierarchy of needs

Why do we do the things we do? What motivations underlie our behaviors? **Motivation** *describes the wants or needs that direct behavior toward a goal*. In addition to biological motives, motivations can be intrinsic (arising from internal factors) or extrinsic (arising from external factors). Intrinsically motivated behaviors are performed because of the sense of personal satisfaction that they bring, while extrinsically motivated behaviors are performed in order to receive something from others.



Intrinsic motivation comes from within the individual, while **extrinsic motivation** comes from outside the individual.

Think about why you are currently in college. Are you here because you enjoy learning and want to pursue an education to make yourself a more well-rounded individual? If so, then you are intrinsically motivated. However, if you are here because you want to get a college degree to make yourself more marketable for a high-paying career or to satisfy the demands of your parents, then your motivation is more extrinsic in nature.

In reality, our motivations are often a mix of both intrinsic and extrinsic factors, but the nature of the mix of these factors might change over time (often in ways that seem counter-intuitive). There is an old adage: “Choose a job that you love, and you will never have to work a day in your life,” meaning that if you enjoy your occupation, work doesn’t seem like . . . well, work. Some research suggests that this isn’t necessarily the case (Daniel & Esser, 1980; Deci, 1972; Deci, Koestner, & Ryan, 1999). According to this research, receiving some sort of extrinsic reinforcement (i.e., getting paid) for engaging in behaviors that we enjoy leads to those behaviors being thought of as work, no longer providing that same enjoyment. As a result, we might spend less time engaging in these reclassified behaviors in the absence of any extrinsic reinforcement. For example, Odessa loves baking, so in her free time, she bakes for fun. Oftentimes, after stocking shelves at her grocery store job, she often whips up pastries in the evenings because she enjoys baking. When a coworker in the store’s bakery department leaves his job, Odessa applies for his position and gets transferred to the bakery department. Although she enjoys what she does in her new job, after a few months, she no longer has much desire to concoct tasty treats in her free time. Baking has become work in a way that changes her motivation to do it. What Odessa has experienced is called the overjustification effect—intrinsic motivation is diminished when extrinsic motivation is given. This can lead to extinguishing the intrinsic motivation and creating a dependence on extrinsic rewards for continued performance (Deci et al., 1999).



Research suggests that when something we love to do, like icing cakes, becomes our job, our intrinsic and extrinsic motivations to do it may change.
(credit: Agustín Ruiz)

Other studies suggest that intrinsic motivation may not be so vulnerable to the effects of extrinsic reinforcements, and in fact, reinforcements such as verbal praise might actually increase intrinsic motivation (Arnold, 1976; Cameron & Pierce, 1994). In that case, Odessa's motivation to bake in her free time might remain high if, for example, customers regularly compliment her baking or cake decorating skills.

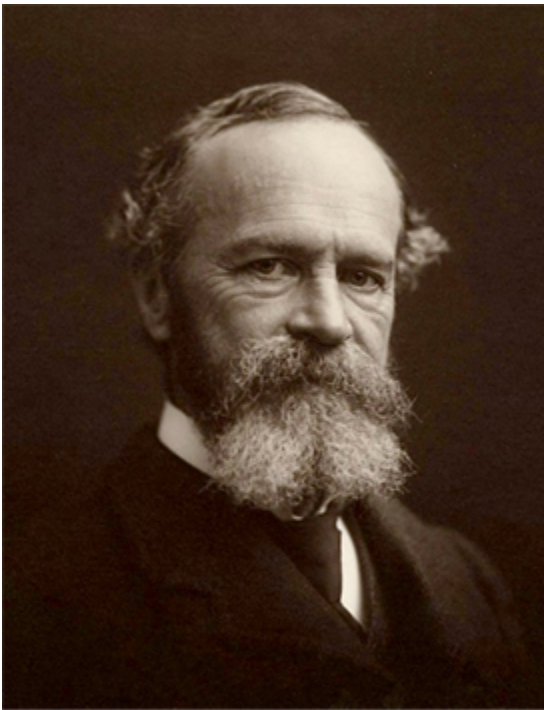
These apparent discrepancies in the researchers' findings may be understood by considering several factors. For one, physical reinforcement (such as money) and verbal reinforcement (such as praise) may affect an individual in very different ways. In fact, tangible rewards (i.e., money) tend to have more negative effects on intrinsic motivation than do intangible rewards (i.e., praise). Furthermore, the expectation of the extrinsic motivator by an individual is crucial: If the person expects to receive an extrinsic reward, then intrinsic motivation for the task tends to be reduced. If, however, there is no such expectation, and the extrinsic motivation is presented as a surprise, then intrinsic motivation for the task tends to persist (Deci et al., 1999).

In educational settings, students are more likely to experience intrinsic motivation to learn when they feel a sense of belonging and respect in the classroom. This internalization can be enhanced if the evaluative aspects of the classroom are de-emphasized and if students feel that they exercise some control over the learning environment. Furthermore, providing students with activities that are challenging, yet doable, along with a rationale for engaging in various learning activities can enhance intrinsic motivation for those tasks (Niemiec & Ryan, 2009). Consider Hakim, a first-year law student with two courses this semester: Family Law and Criminal Law. The Family Law professor has a rather intimidating classroom: He likes to put students on the spot with tough questions, which often leaves students feeling belittled or embarrassed. Grades are based exclusively on quizzes and exams, and the instructor posts results of each test on the classroom door. In contrast, the Criminal Law professor facilitates classroom discussions and respectful debates in small groups. The majority of the course grade is not exam-based, but centers on a student-designed research project on a crime issue of the student's choice. Research suggests that Hakim will be less intrinsically motivated in

his Family Law course, where students are intimidated in the classroom setting and there is an emphasis on teacher-driven evaluations. Hakim is likely to experience a higher level of intrinsic motivation in his Criminal Law course, where the class setting encourages inclusive collaboration and a respect for ideas, and where students have more influence over their learning activities.

Theories about Motivation

William James (1842–1910) was an important contributor to early research into motivation, and he is often referred to as the father of psychology in the United States. James theorized that behavior was driven by a number of instincts, which aid survival. From a biological perspective, an **instinct** *is a species-specific pattern of behavior that is not learned*. There was, however, considerable controversy among James and his contemporaries over the exact definition of instinct. James proposed several dozen special human instincts, but many of his contemporaries had their own lists that differed. A mother's protection of her baby, the urge to lick sugar, and hunting prey were among the human behaviors proposed as true instincts during James's era. This view—that human behavior is driven by instincts—received a fair amount of criticism because of the undeniable role of learning in shaping all sorts of human behavior. In fact, as early as the 1900s, some instinctive behaviors were experimentally demonstrated to result from associative learning (recall when you learned about Watson's conditioning of fear response in “Little Albert”) (Faris, 1921).



(a)



(b)

(a) William James proposed the instinct theory of motivation, asserting that behavior is driven by instincts. (b) In humans, instincts may include behaviors such as an infant's rooting for a nipple and sucking. (credit b: modification of work by "Mothering Touch"/Flickr)

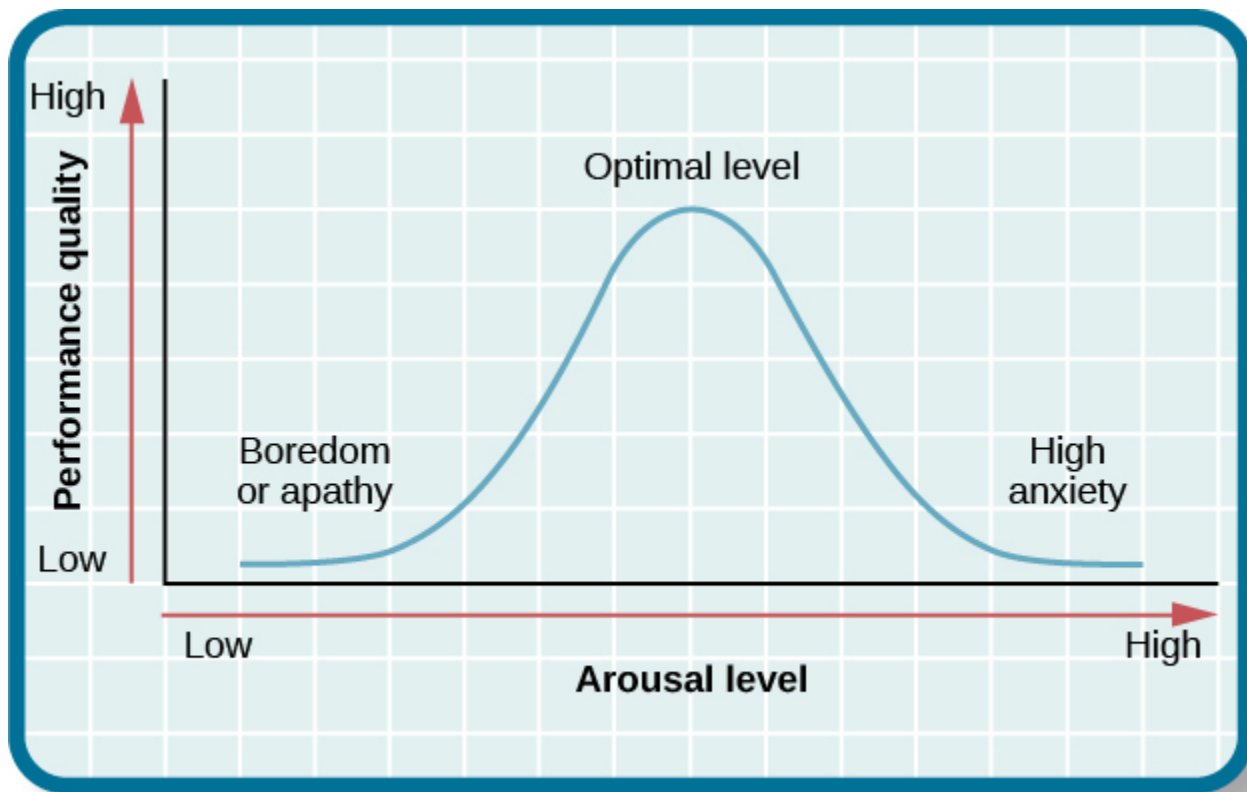
Another early theory of motivation proposed that the maintenance of homeostasis is particularly important in directing behavior. You may recall from your earlier reading that homeostasis is the tendency to maintain a balance, or optimal level, within a biological system. In a body system, a control center (which is often part of the brain) receives input from receptors (which are often complexes of neurons). The control center directs effectors (which may be other neurons) to correct any imbalance detected by the control center.

According to the **drive theory of motivation**, *deviations from homeostasis create physiological needs*. These needs result in psychological drive states that direct behavior to meet the need and, ultimately, bring the system back to homeostasis. For example, if it's been a while since you ate, your blood sugar levels will drop below normal. This low blood sugar will induce a physiological need and a corresponding drive state (i.e., hunger) that will direct you to seek out and consume food. Eating will eliminate the hunger, and, ultimately, your blood sugar levels will return to normal. Interestingly, drive theory also emphasizes the role that habits play in the type of behavioral response in which we engage. A **habit** is a *pattern of behavior in which we regularly engage*. Once we have engaged in a behavior that successfully reduces a drive, we are more likely to engage in that behavior whenever faced with that drive in the future (Graham & Weiner, 1996).



Hunger and subsequent eating are the result of complex physiological processes that maintain homeostasis. (credit “left”: modification of work by “Gracie and Viv”/Flickr; credit “center”: modification of work by Steven Depolo; credit “right”: modification of work by Monica Renata)

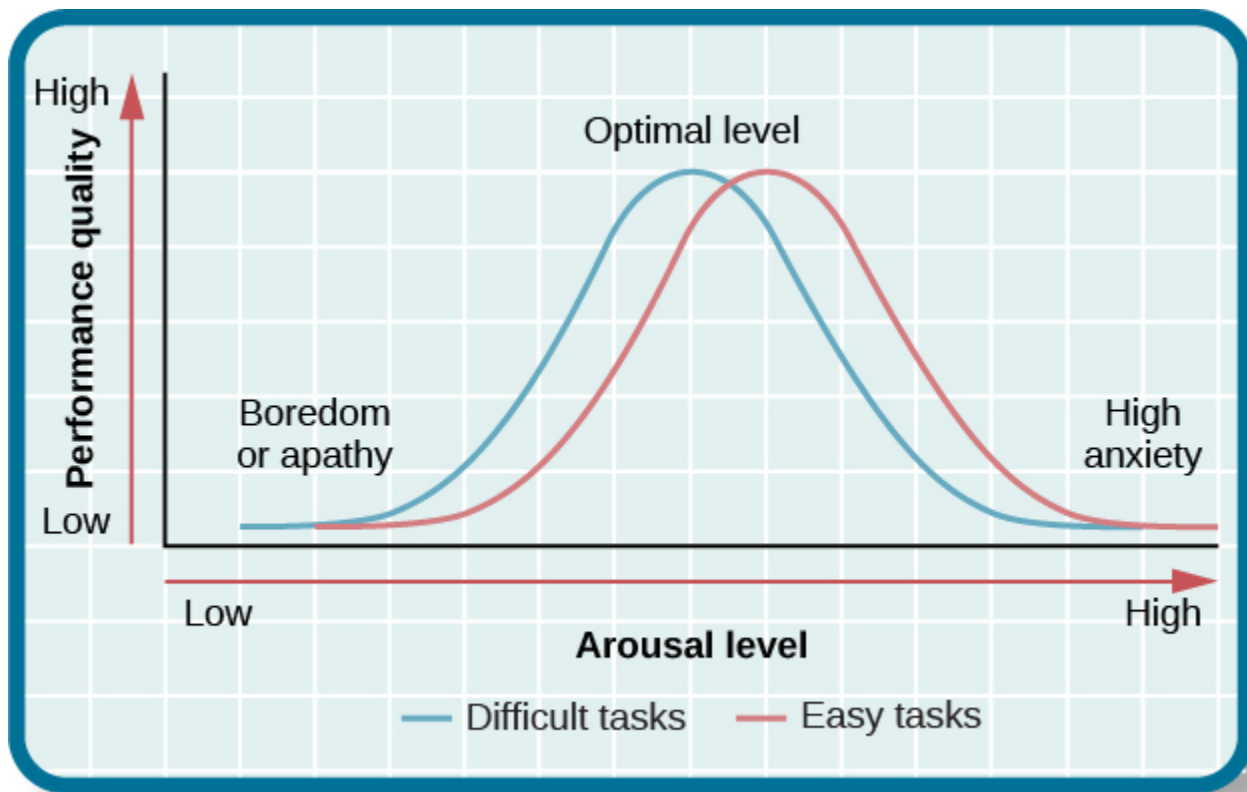
Extensions of drive theory take into account levels of arousal as potential motivators. As you recall from your study of learning, these theories assert that there is an optimal level of arousal that we all try to maintain. If we are underaroused, we become bored and will seek out some sort of stimulation. On the other hand, if we are overaroused, we will engage in behaviors to reduce our arousal (Berlyne, 1960). Most students have experienced this need to maintain optimal levels of arousal over the course of their academic career. Think about how much stress students experience toward the end of spring semester. They feel overwhelmed with seemingly endless exams, papers, and major assignments that must be completed on time. They probably yearn for the rest and relaxation that awaits them over the extended summer break. However, once they finish the semester, it doesn’t take too long before they begin to feel bored. Generally, by the time the next semester is beginning in the fall, many students are quite happy to return to school. This is an example of how arousal theory works.



The concept of optimal arousal in relation to performance on a task is depicted here. Performance is maximized at the optimal level of arousal, and it tapers off during under- and overarousal.

So what is the optimal level of arousal? What level leads to the best performance? Research shows that moderate arousal is generally best; when arousal is very high or very low, performance tends to suffer (Yerkes & Dodson, 1908). Think of your arousal level regarding taking an exam for this class. If your level is very low, such as boredom and apathy, your performance will likely suffer. Similarly, a very high level, such as extreme anxiety, can be paralyzing and hinder performance. Consider the example of a softball team facing a tournament. They are favored to win their first game by a large margin, so they go into the game with a lower level of arousal and get beat by a less skilled team.

But optimal arousal level is more complex than a simple answer that the middle level is always best. Researchers Robert Yerkes (pronounced “Yerk-EES”) and John Dodson discovered that the optimal arousal level depends on the complexity and difficulty of the task to be performed. This relationship is known as **Yerkes-Dodson law**, which holds that a simple task is performed best when arousal levels are relatively high and complex tasks are best performed when arousal levels are lower.



Task performance is best when arousal levels are in a middle range, with difficult tasks best performed under lower levels of arousal and simple tasks best performed under higher levels of arousal.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=719#h5p-185>

Self-efficacy and Social Motives

Self-efficacy is an individual's belief in her own capability to complete a task, which may include a previous

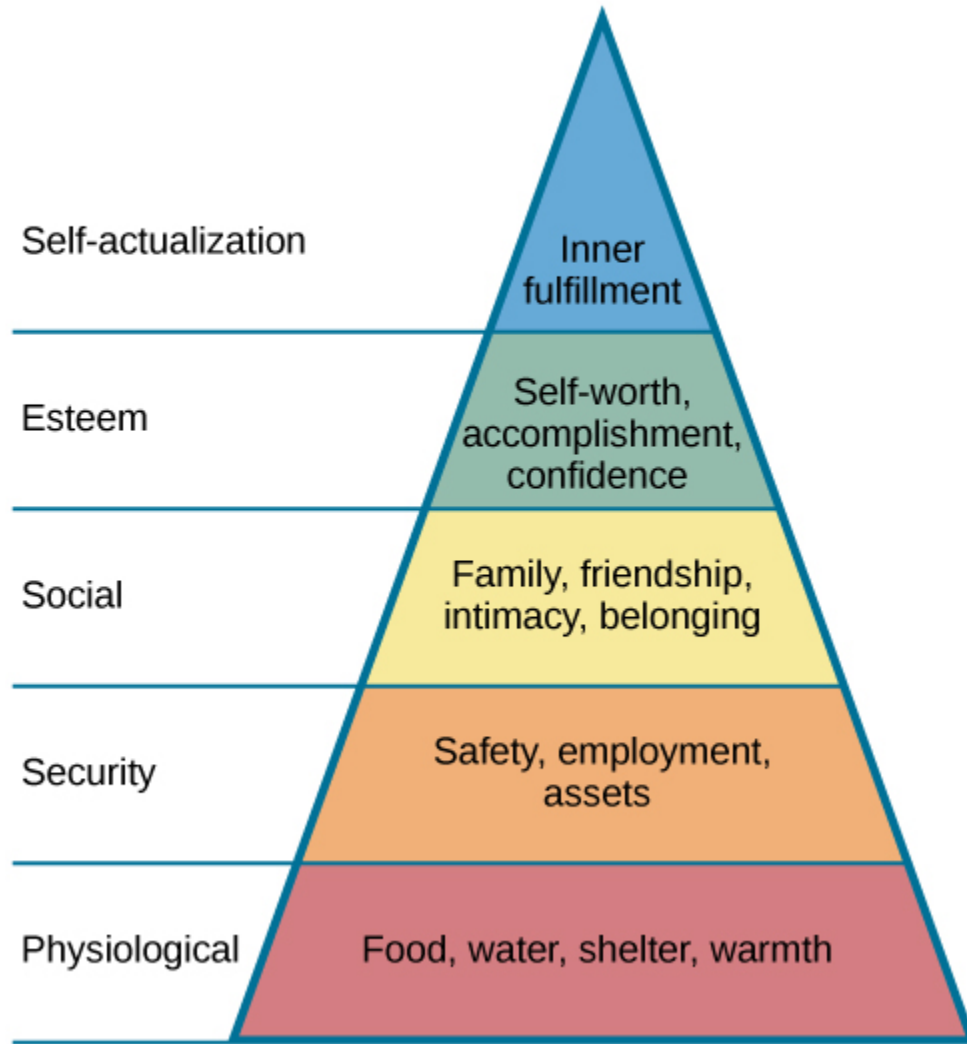
successful completion of the exact task or a similar task. Albert Bandura (1994) theorized that an individual's sense of self-efficacy plays a pivotal role in motivating behavior. Bandura argues that motivation derives from expectations that we have about the consequences of our behaviors, and ultimately, it is the appreciation of our capacity to engage in a given behavior that will determine what we do and the future goals that we set for ourselves. For example, if you have a sincere belief in your ability to achieve at the highest level, you are more likely to take on challenging tasks and to not let setbacks dissuade you from seeing the task through to the end.

A number of theorists have focused their research on understanding social motives (McAdams & Constantian, 1983; McClelland & Liberman, 1949; Murray et al., 1938). Among the motives they describe are needs for achievement, affiliation, and intimacy. It is the need for achievement that drives accomplishment and performance. The need for affiliation encourages positive interactions with others, and the need for intimacy causes us to seek deep, meaningful relationships. Henry Murray et al. (1938) categorized these needs into domains. For example, the need for achievement and recognition falls under the domain of ambition. Dominance and aggression were recognized as needs under the domain of human power, and play was a recognized need in the domain of interpersonal affection.

Maslow's Hierarchy of Needs

While the theories of motivation described earlier relate to basic biological drives, individual characteristics, or social contexts, Abraham Maslow (1943) proposed a **hierarchy of needs** *that spans the spectrum of motives ranging from the biological to the individual to the social.* These needs are often depicted as a pyramid.

Maslow's Hierarchy of Needs



Maslow's hierarchy of needs is illustrated here. In some versions of the pyramid, cognitive and aesthetic needs are also included between esteem and self-actualization. Others include another tier at the top of the pyramid for self-transcendence.

At the base of the pyramid are all of the physiological needs that are necessary for survival. These are followed by basic needs for security and safety, the need to be loved and to have a sense of belonging, and the need to have self-worth and confidence. The top tier of the pyramid is self-actualization, which is a need that essentially equates to achieving one's full potential, and it can only be realized when needs lower on the pyramid have been met. To Maslow and humanistic theorists, self-actualization reflects the humanistic emphasis on positive aspects of human nature. Maslow suggested that this is an ongoing, life-long process and that only a small percentage of people actually achieve a self-actualized state (Francis & Kritsonis, 2006; Maslow, 1943).

According to Maslow (1943), one must satisfy lower-level needs before addressing those needs that occur higher in the pyramid. So, for example, if someone is struggling to find enough food to meet his nutritional

requirements, it is quite unlikely that he would spend an inordinate amount of time thinking about whether others viewed him as a good person or not. Instead, all of his energies would be geared toward finding something to eat. However, it should be pointed out that Maslow's theory has been criticized for its subjective nature and its inability to account for phenomena that occur in the real world (Leonard, 1982). Other research has more recently addressed that late in life, Maslow proposed a self-transcendence level above self-actualization—to represent striving for meaning and purpose beyond the concerns of oneself (Koltko-Rivera, 2006). For example, people sometimes make self-sacrifices in order to make a political statement or in an attempt to improve the conditions of others. Mohandas K. Gandhi, a world-renowned advocate for independence through nonviolent protest, on several occasions went on hunger strikes to protest a particular situation. People may starve themselves or otherwise put themselves in danger, displaying higher-level motives beyond their own needs.

Check out this interactive exercise that illustrates some of the important concepts in Maslow's hierarchy of needs: [Maslow's Hierarchy of Needs Exercise](#).

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=719#h5p-186>

Critical Thinking Questions

How might someone espousing an arousal theory of motivation explain visiting an amusement park?

The idea of optimal levels of arousal is similar to a drive theory of motivation. Presumably, we all seek to maintain some intermediate level of arousal. If we are underaroused, we are bored. If we are overaroused, we experience stress. The rides at an amusement park would provide higher arousal (however, we would hope that these rides don't actually pose significant threats to personal safety that would lead to a state of panic) to push us toward our own optimal level of arousal. Individuals at the park would choose different rides based on their specific arousal thresholds; for example, one person might find a simple water ride optimally arousing and an extreme roller coaster overarousing, while others would find the extreme roller coaster optimally arousing.

Schools often use concrete rewards to increase adaptive behaviors. How might this be a disadvantage for students intrinsically motivated to learn? What are educational implications of the potential for concrete rewards to diminish intrinsic motivation for a given task?

We would expect to see a shift from learning for the sake of learning to learning to earn some reward. This would undermine the foundation upon which traditional institutions of higher education are built. For a student motivated by extrinsic rewards, dependence on those may pose issues later in life (post-school) when there are not typically extrinsic rewards for learning.

Personal Application Question

Can you think of recent examples of how Maslow's hierarchy of needs might have affected your behavior in some way?

Summary

Motivation to engage in a given behavior can come from internal and/or external factors. Multiple theories have been put forward regarding motivation. More biologically oriented theories deal with the ways that instincts and the need to maintain bodily homeostasis motivate behavior. Bandura postulated that our sense

of self-efficacy motivates behaviors, and there are a number of theories that focus on a variety of social motives. Abraham Maslow's hierarchy of needs is a model that shows the relationship among multiple motives that range from lower-level physiological needs to a very high level of self-actualization.

49.

HUNGER AND EATING

Learning Objectives

By the end of this section, you will be able to:

- Describe how hunger and eating are regulated
- Differentiate between levels of overweight and obesity and the associated health consequences
- Explain the health consequences resulting from anorexia and bulimia nervosa

Eating is essential for survival, and it is no surprise that a drive like hunger exists to ensure that we seek out sustenance. While this chapter will focus primarily on the physiological mechanisms that regulate hunger and eating, powerful social, cultural, and economic influences also play important roles. This section will explain the regulation of hunger, eating, and body weight, and we will discuss the adverse consequences of disordered eating.

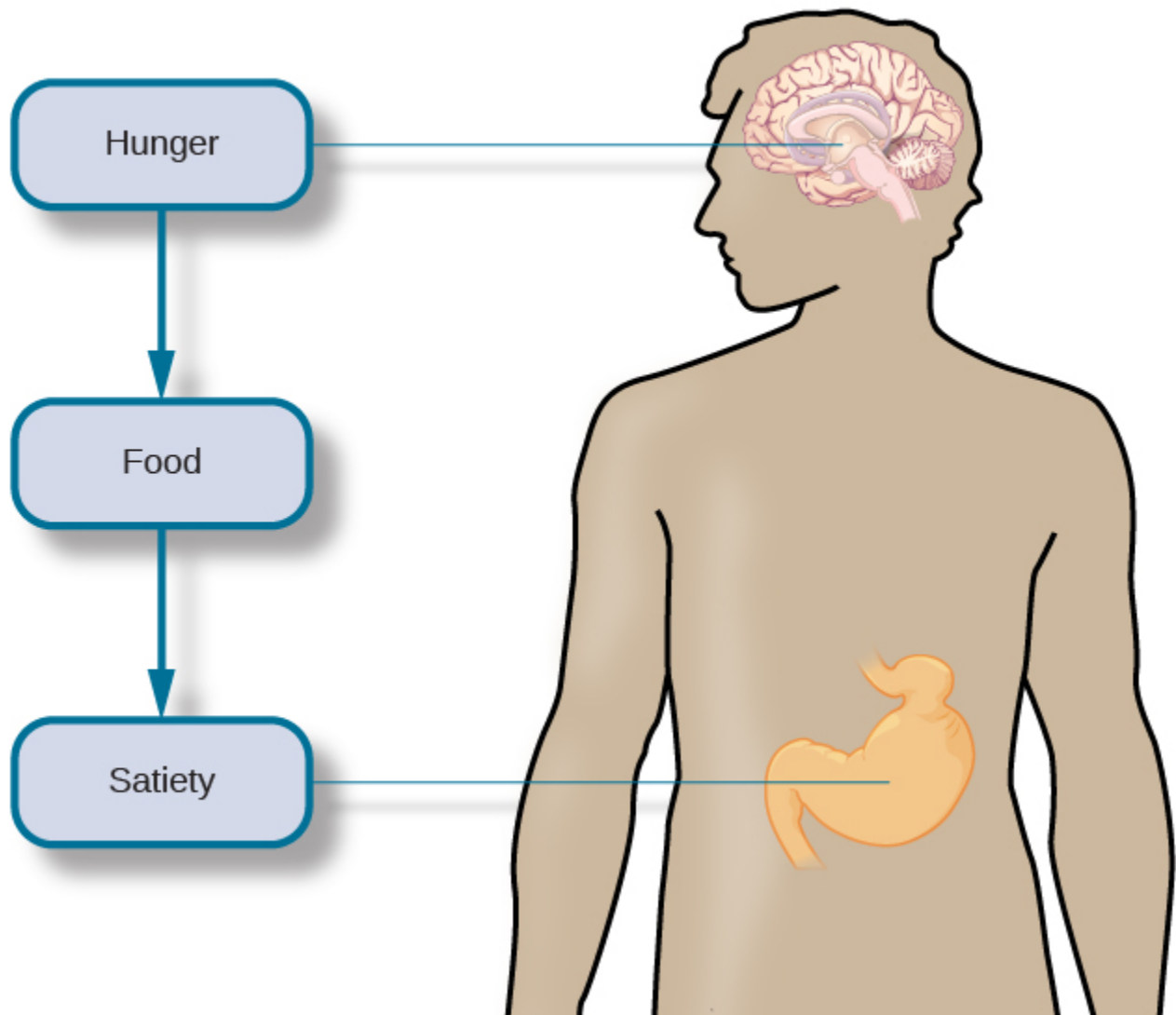
Physiological Mechanisms

There are a number of physiological mechanisms that serve as the basis for hunger. When our stomachs are empty, they contract, causing both hunger pangs and the secretion of chemical messages that travel to the brain to serve as a signal to initiate feeding behavior. When our blood glucose levels drop, the pancreas and liver generate a number of chemical signals that induce hunger (Konturek et al., 2003; Novin, Robinson, Culbreth, & Tordoff, 1985) and thus initiate feeding behavior.

For most people, once they have eaten, they feel satiation, or fullness and satisfaction, and their eating behavior stops. Like the initiation of eating, satiation is also regulated by several physiological mechanisms. As blood glucose levels increase, the pancreas and liver send signals to shut off hunger and eating (Drazen &

Woods, 2003; Druce, Small, & Bloom, 2004; Greary, 1990). The food's passage through the gastrointestinal tract also provides important satiety signals to the brain (Woods, 2004), and fat cells release **leptin**, a *satiety hormone*.

The various hunger and satiety signals that are involved in the regulation of eating are integrated in the brain. Research suggests that several areas of the hypothalamus and hindbrain are especially important sites where this integration occurs (Ahima & Antwi, 2008; Woods & D'Alessio, 2008). Ultimately, activity in the brain determines whether or not we engage in feeding behavior.



Hunger and eating are regulated by a complex interplay of hunger and satiety signals that are integrated in the brain.

Metabolism and Body Weight

Our body weight is affected by a number of factors, including gene-environment interactions, and the number

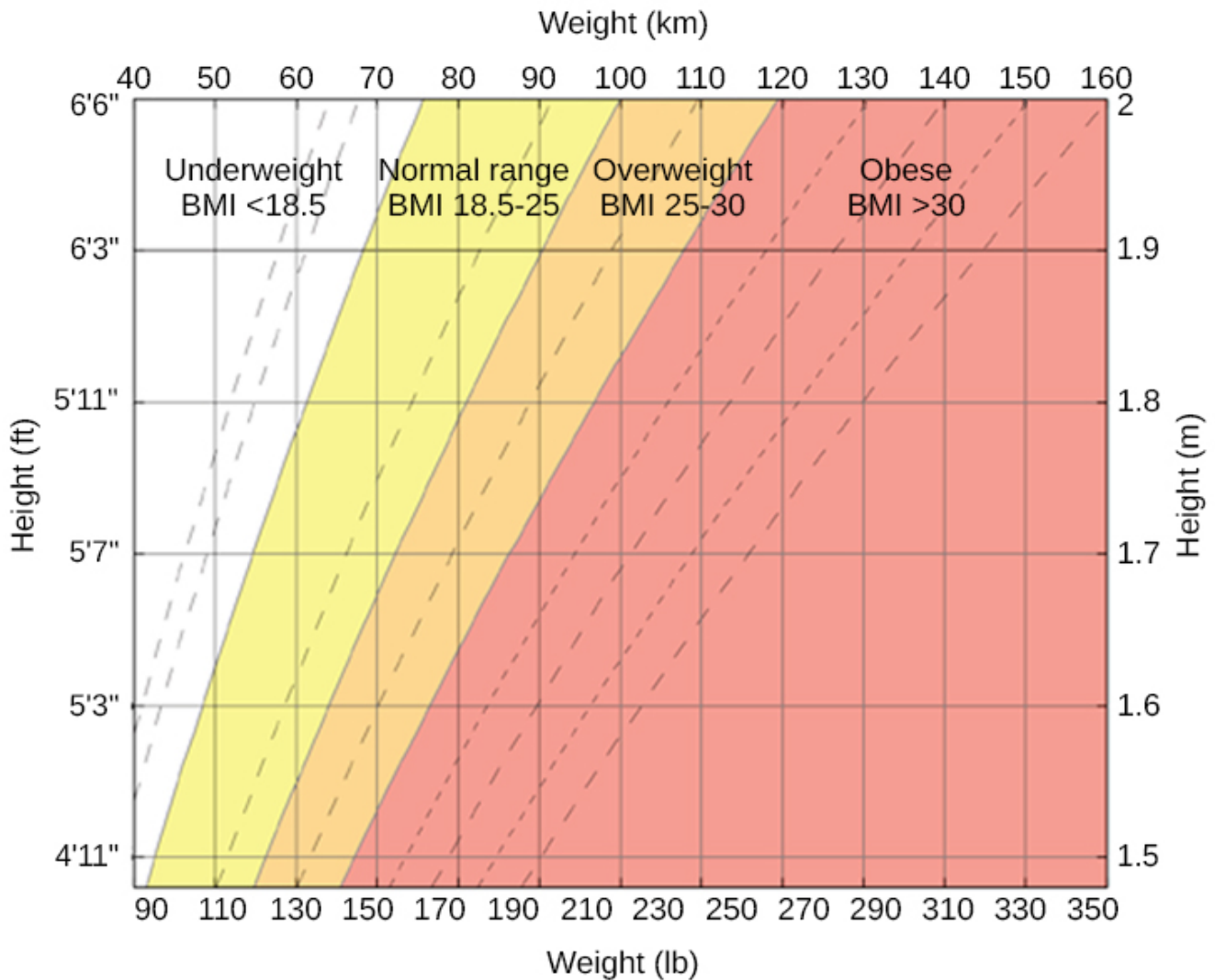
of calories we consume versus the number of calories we burn in daily activity. If our caloric intake exceeds our caloric use, our bodies store excess energy in the form of fat. If we consume fewer calories than we burn off, then stored fat will be converted to energy. Our energy expenditure is obviously affected by our levels of activity, but our body's metabolic rate also comes into play. A person's **metabolic rate** *is the amount of energy that is expended in a given period of time*, and there is tremendous individual variability in our metabolic rates. People with high rates of metabolism are able to burn off calories more easily than those with lower rates of metabolism.

We all experience fluctuations in our weight from time to time, but generally, most people's weights fluctuate within a narrow margin, in the absence of extreme changes in diet and/or physical activity. This observation led some to propose a set-point theory of body weight regulation. The set-point theory asserts that each individual has an ideal body weight, or set point, which is resistant to change. This set-point is genetically predetermined, and efforts to move our weight significantly from the set-point are resisted by compensatory changes in energy intake and/or expenditure (Speakman et al., 2011).

Some of the predictions generated from this particular theory have not received empirical support. For example, there are no changes in metabolic rate between individuals who had recently lost significant amounts of weight and a control group (Weinsier et al., 2000). In addition, the set-point theory fails to account for the influence of social and environmental factors in the regulation of body weight (Martin-Gronert & Ozanne, 2013; Speakman et al., 2011). Despite these limitations, set-point theory is still often used as a simple, intuitive explanation of how body weight is regulated.

Obesity

When someone weighs more than what is generally accepted as healthy for a given height, they are considered overweight or **obese**. According to the Centers for Disease Control and Prevention (CDC), *an adult with a body mass index (BMI) between 25 and 29.9 is considered overweight*. An adult with a BMI of 30 or higher is considered obese (Centers for Disease Control and Prevention [CDC], 2012). People who are so overweight that they are at risk for death are classified as morbidly obese. **Morbid obesity** *is defined as having a BMI over 40*. Note that although BMI has been used as a healthy weight indicator by the World Health Organization (WHO), the CDC, and other groups, its value as an assessment tool has been questioned. The BMI is most useful for studying populations, which is the work of these organizations. It is less useful in assessing an individual, since height and weight measurements fail to account for important factors like fitness level. An athlete, for example, may have a high BMI because the tool doesn't distinguish between the body's percentage of fat and muscle in a person's weight.



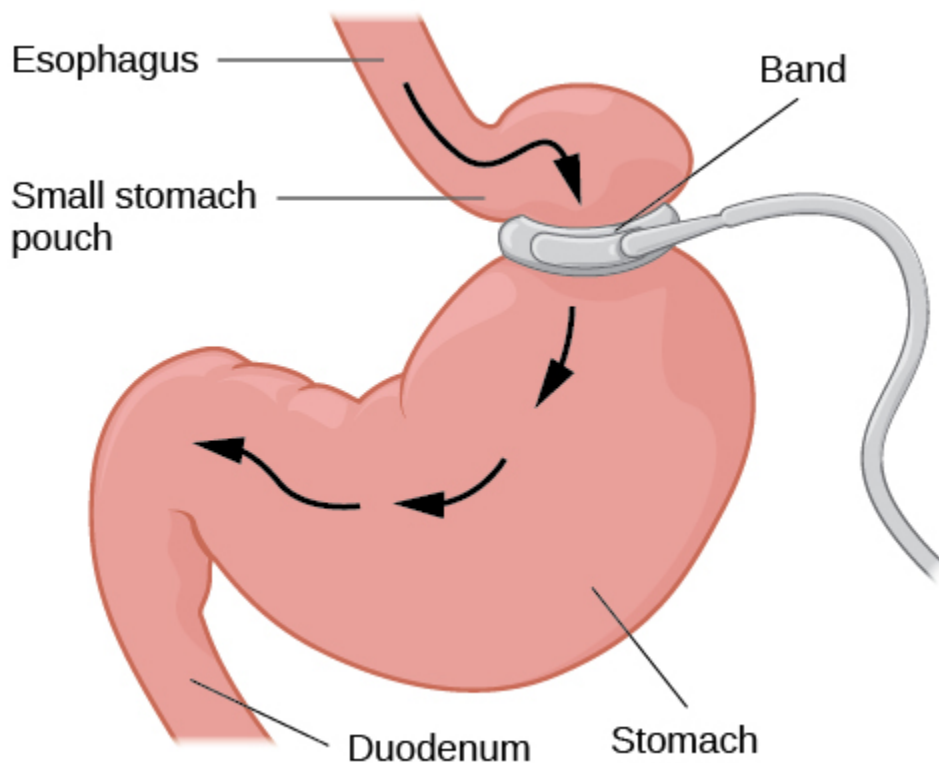
This is a graph of BMI categories based on the World Health Organization data. The dashed lines represent subdivisions within a major categorization.

Being extremely overweight or obese is a risk factor for several negative health consequences. These include, but are not limited to, an increased risk for cardiovascular disease, stroke, Type 2 diabetes, liver disease, sleep apnea, colon cancer, breast cancer, infertility, and arthritis. Given that it is estimated that in the United States around one-third of the adult population is obese and that nearly two-thirds of adults and one in six children qualify as overweight (CDC, 2012), there is substantial interest in trying to understand how to combat this important public health concern.

What causes someone to be overweight or obese? You have already read that both genes and environment are important factors for determining body weight, and if more calories are consumed than expended, excess energy is stored as fat. However, socioeconomic status and the physical environment must also be considered as contributing factors (CDC, 2012). For example, an individual who lives in an impoverished neighborhood that is overrun with a crime may never feel comfortable walking or biking to work or to the local market.

This might limit the amount of physical activity in which he engages and result in increased body weight. Similarly, some people may not be able to afford healthy food options from their market, or these options may be unavailable (especially in urban areas or poorer neighborhoods); therefore, some people rely primarily on available, inexpensive, high fat, and high-calorie fast food as their primary source of nutrition.

Generally, overweight and obese individuals are encouraged to try to reduce their weight through a combination of both diet and exercise. While some people are very successful with these approaches, many struggle to lose excess weight. In cases in which a person has had no success with repeated attempts to reduce weight or is at risk for death because of obesity, bariatric surgery may be recommended. **Bariatric surgery** is a type of surgery specifically aimed at weight reduction, and it involves modifying the gastrointestinal system to reduce the amount of food that can be eaten and/or limiting how much of the digested food can be absorbed (Mayo Clinic, 2013). A recent meta-analysis suggests that bariatric surgery is more effective than non-surgical treatment for obesity in the two-years immediately following the procedure, but to date, no long-term studies yet exist (Gloy et al., 2013).



Gastric banding surgery creates a small pouch of stomach, reducing the size of the stomach that can be used for digestion.

Prader-Willi Syndrome

Prader-Willi Syndrome (PWS) is a genetic disorder that results in persistent feelings of intense hunger and

reduced rates of metabolism. Typically, affected children have to be supervised around the clock to ensure that they do not engage in excessive eating. Currently, PWS is the leading genetic cause of morbid obesity in children, and it is associated with a number of cognitive deficits and emotional problems.



Eugenia Martínez Vallejo, depicted in this 1680 painting, may have had Prader-Willi syndrome. At just eight years old, she weighed approximately 120 pounds, and she was nicknamed “La Monstrua” (the monster).

While genetic testing can be used to make a diagnosis, there are a number of behavioral diagnostic criteria associated with PWS. From birth to 2 years of age, lack of muscle tone and poor sucking behavior may serve as early signs of PWS. Developmental delays are seen between the ages of 6 and 12, and excessive eating and cognitive deficits associated with PWS usually onset a little later.

While the exact mechanisms of PWS are not fully understood, there is evidence that affected individuals have hypothalamic abnormalities. This is not surprising, given the hypothalamus’s role in regulating hunger and eating. However, as you will learn in the next section of this chapter, the hypothalamus is also involved

in the regulation of sexual behavior. Consequently, many individuals suffering from PWS fail to reach sexual maturity during adolescence.

There is no current treatment or cure for PWS. However, if weight can be controlled in these individuals, then their life expectancies are significantly increased (historically, sufferers of PWS often died in adolescence or early adulthood). Advances in the use of various psychoactive medications and growth hormones continue to enhance the quality of life for individuals with PWS (Cassidy & Driscoll, 2009; Prader-Willi Syndrome Association, 2012).

Eating Disorders

While nearly two out of three US adults struggle with issues related to being overweight, a smaller, but significant, portion of the population has eating disorders that typically result in being normal weight or underweight. Often, these individuals are fearful of gaining weight. Individuals who suffer from bulimia nervosa and anorexia nervosa face many adverse health consequences (Mayo Clinic, 2012a, 2012b).

People suffering from **bulimia nervosa** *engage in binge eating behavior that is followed by an attempt to compensate for a large amount of food consumed*. Purging the food by inducing vomiting or through the use of laxatives are two common compensatory behaviors. Some affected individuals engage in excessive amounts of exercise to compensate for their binges. Bulimia is associated with many adverse health consequences that can include kidney failure, heart failure, and tooth decay. In addition, these individuals often suffer from anxiety and depression, and they are at an increased risk for substance abuse (Mayo Clinic, 2012b). The lifetime prevalence rate for bulimia nervosa is estimated at around 1% for women and less than 0.5% for men (Smink, van Hoeken, & Hoek, 2012).

As of the 2013 release of the *Diagnostic and Statistical Manual, fifth edition*, **Binge eating disorder** is a disorder recognized by the American Psychiatric Association (APA). Unlike with bulimia, *eating binges are not followed by inappropriate behavior, such as purging, but they are followed by distress, including feelings of guilt and embarrassment*. The resulting psychological distress distinguishes binge eating disorder from overeating (American Psychiatric Association [APA], 2013).

Anorexia nervosa *is an eating disorder characterized by the maintenance of a body weight well below average through starvation and/or excessive exercise*. Individuals suffering from anorexia nervosa often have a **distorted body image**, *referenced in literature as a type of body dysmorphia, meaning that they view themselves as overweight even though they are not*. Like bulimia nervosa, anorexia nervosa is associated with a number of significant negative health outcomes: bone loss, heart failure, kidney failure, amenorrhea (cessation of the menstrual period), reduced function of the gonads, and in extreme cases, death. Furthermore, there is an increased risk for a number of psychological problems, which include anxiety disorders, mood disorders, and substance abuse (Mayo Clinic, 2012a). Estimates of the prevalence of anorexia nervosa vary from study

to study but generally range from just under one percent to just over four percent in women. Generally, prevalence rates are considerably lower for men (Smink et al., 2012).

While both anorexia and bulimia nervosa occur in men and women of many different cultures, Caucasian females from Western societies tend to be the most at-risk population. Recent research indicates that females between the ages of 15 and 19 are most at risk, and it has long been suspected that these eating disorders are culturally-bound phenomena that are related to messages of a thin ideal often portrayed in popular media and the fashion world (Smink et al., 2012). While social factors play an important role in the development of eating disorders, there is also evidence that genetic factors may predispose people to these disorders (Collier & Treasure, 2004).



Young women in our society are inundated with images of extremely thin models (sometimes accurately depicted and sometimes digitally altered to make them look even thinner). These images may contribute to eating disorders. (credit: Peter Duhon)

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=721#h5p-188>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=721#h5p-189>

Critical Thinking Questions

The index that is often used to classify people as being underweight, normal weight, overweight, obese, or morbidly obese is called BMI. Given that BMI is calculated solely on weight and height, how could it be misleading?

Using BMI as a sole metric can actually be misleading because people who have large amounts of lean muscle mass can actually be characterized as being overweight or obese based on their

height and weight. Weight versus height is a somewhat crude measurement as it doesn't distinguish the amount of body weight that comes from lean versus fatty tissue.

As indicated in this section, Caucasian women from industrialized, Western cultures tend to be at the highest risk for eating disorders like anorexia and bulimia nervosa. Why might this be? These disorders are closely associated with sociocultural emphasis on a thin-ideal that is often portrayed in media. Given that non-Caucasians are under-represented in popular media in the West and that the thin-ideal is more heavily emphasized for women, this particular group is most vulnerable.

Personal Application Question

Think about popular television programs on the air right now. What do the women in these programs look like? What do the men look like? What kinds of messages do you think the media is sending about men and women in our society?

Summary

Hunger and satiety are highly regulated processes that result in a person maintaining a fairly stable weight that is resistant to change. When more calories are consumed than expended, a person will store excess energy as fat. Being significantly overweight adds substantially to a person's health risks and problems, including cardiovascular disease, type 2 diabetes, certain cancers, and other medical issues. Sociocultural factors that emphasize thinness as a beauty ideal and a genetic predisposition contribute to the development of eating disorders in many young females, though eating disorders span ages and genders.

50.

SEXUAL BEHAVIOR

Learning Objectives

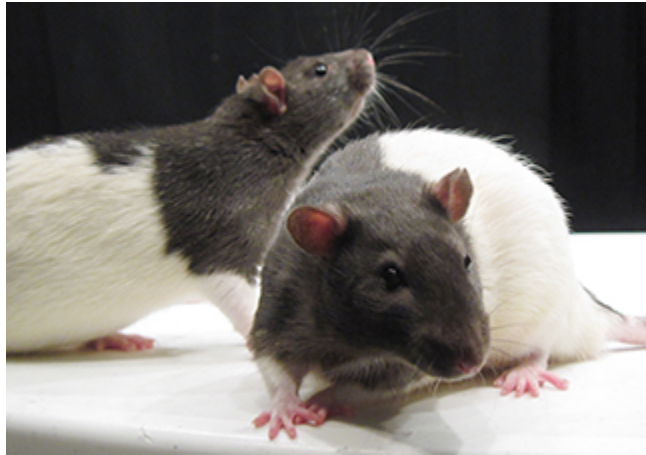
By the end of this section, you will be able to:

- Understand basic biological mechanisms regulating sexual behavior and motivation
- Define sexual orientation and gender identity

Like food, sex is an important part of our lives. From an evolutionary perspective, the reason is obvious—perpetuation of the species. Sexual behavior in humans, however, involves much more than reproduction. This section provides an overview of research that has been conducted on human sexual behavior and motivation. This section will close with a discussion of issues related to gender and sexual orientation.

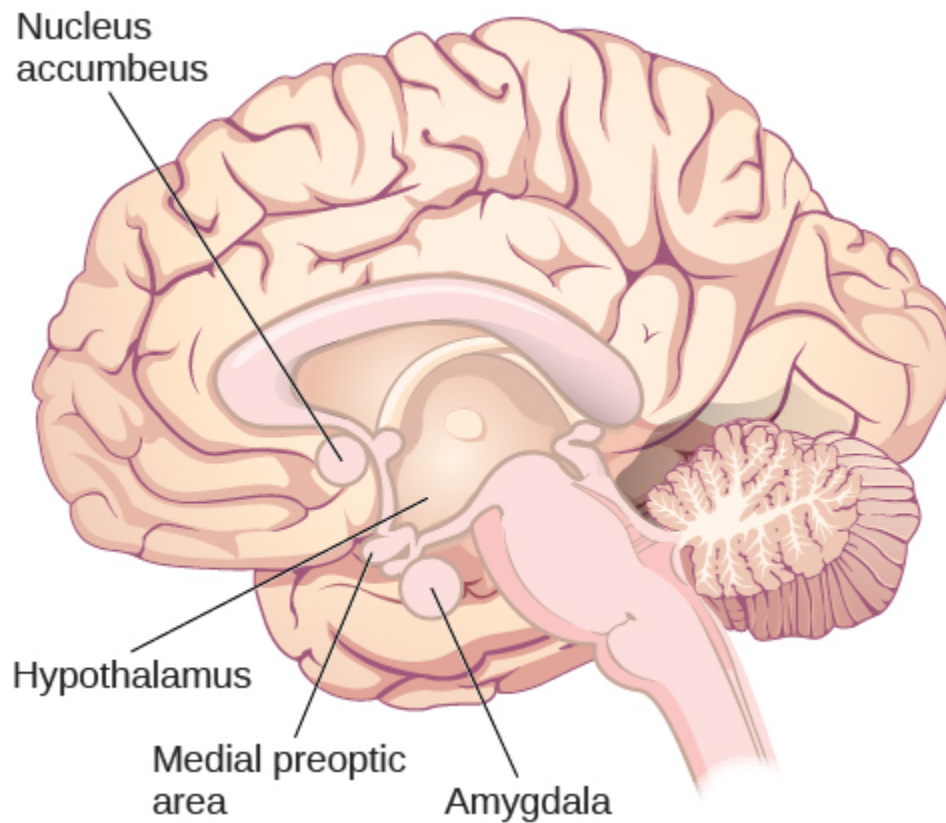
Physiological Mechanisms of Sexual Behavior and Motivation

Much of what we know about the physiological mechanisms that underlie sexual behavior and motivation comes from animal research. As you've learned, the hypothalamus plays an important role in motivated behaviors, and sex is no exception. In fact, lesions to an area of the hypothalamus called the medial preoptic area completely disrupt a male rat's ability to engage in sexual behavior. Surprisingly, medial preoptic lesions do not change how hard a male rat is willing to work to gain access to a sexually receptive female. This suggests that the ability to engage in sexual behavior and the motivation to do so may be mediated by neural systems distinct from one another.



A male rat that cannot engage in sexual behavior still seeks receptive females, suggesting that the ability to engage in sexual behavior and the motivation to do so are mediated by different systems in the brain. (credit: Jason Snyder)

Animal research suggests that limbic system structures such as the amygdala and nucleus accumbens are especially important for sexual motivation. Damage to these areas results in a decreased motivation to engage in sexual behavior, while leaving the ability to do so intact (Everett, 1990). Similar dissociations of sexual motivation and sexual ability have also been observed in the female rat (Becker, Rudick, & Jenkins, 2001; Jenkins & Becker, 2001).



The medial preoptic area, an area of the hypothalamus, is involved in the ability to engage in sexual behavior, but it does not affect sexual motivation. In contrast, the amygdala and nucleus accumbens are involved in motivation for sexual behavior, but they do not affect the ability to engage in it.

Although human sexual behavior is much more complex than that seen in rats, some parallels between animals and humans can be drawn from this research. The worldwide popularity of drugs used to treat erectile dysfunction (Conrad, 2005) speaks to the fact that sexual motivation and the ability to engage in sexual behavior can also be dissociated in humans. Moreover, disorders that involve abnormal hypothalamic function are often associated with hypogonadism (reduced function of the gonads) and reduced sexual function (e.g., Prader-Willi syndrome). Given the hypothalamus's role in endocrine function, it is not surprising that hormones secreted by the endocrine system also play important roles in sexual motivation and behavior. For example, many animals show no sign of sexual motivation in the absence of the appropriate combination of sex hormones from their gonads. While this is not the case for humans, there is considerable evidence that sexual motivation for both men and women varies as a function of circulating testosterone levels (Bhasin, Enzlin, Coviello, & Basson, 2007; Carter, 1992; Sherwin, 1988).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=723#h5p-191>

Sexual Orientation

A person's **sexual orientation** is *their emotional and erotic attraction toward another individual*. While the majority of people identify as heterosexual, there is a sizable population of people within the United States who identify as either homosexual or bisexual. Research suggests that somewhere between 3% and 10% of the population identifies as homosexual (Kinsey, Pomeroy, & Martin, 1948; LeVay, 1996; Pillard & Bailey, 1995).



Between 3% and 10% of the adult population identifies as homosexual. (credit: Till Krech)

Issues of sexual orientation have long fascinated scientists interested in determining what causes one individual to be heterosexual while another is homosexual. For many years, people believed that these differences arose because of different socialization and familial experiences. However, research has consistently demonstrated that the family backgrounds and experiences are very similar among heterosexuals and homosexuals (Bell, Weinberg, & Hammersmith, 1981; Ross & Arrindell, 1988).

Genetic and biological mechanisms have also been proposed, and the balance of research evidence suggests that sexual orientation has an underlying biological component. For instance, over the past 25 years, research has demonstrated gene-level contributions to sexual orientation (Bailey & Pillard, 1991; Hamer, Hu, Magnuson, Hu, & Pattatucci, 1993; Rodriguez-Larralde & Paradisi, 2009), with some researchers estimating that genes account for at least half of the variability seen in human sexual orientation (Pillard & Bailey, 1998). Other studies report differences in brain structure and function between heterosexuals and homosexuals (Allen & Gorski, 1992; Byne et al., 2001; Hu et al., 2008; LeVay, 1991; Ponseti et al., 2006; Rahman & Wilson, 2003a; Swaab & Hofman, 1990), and even differences in basic body structure and function have been observed

(Hall & Kimura, 1994; Lippa, 2003; Loehlin & McFadden, 2003; McFadden & Champlin, 2000; McFadden & Pasanen, 1998; Rahman & Wilson, 2003b). In aggregate, the data suggest that to a significant extent, sexual orientations are something with which we are born.

Misunderstandings about Sexual Orientation

Regardless of how sexual orientation is determined, research has made clear that sexual orientation is not a choice, but rather it is a relatively stable characteristic of a person that cannot be changed. Claims of successful gay conversion therapy have received wide criticism from the research community due to significant concerns with research design, recruitment of experimental participants, and interpretation of data. As such, there is no credible scientific evidence to suggest that individuals can change their sexual orientation (Jenkins, 2010).

Dr. Robert Spitzer, the author of one of the most widely-cited examples of successful conversion therapy, apologized to both the scientific community and the gay community for his mistakes, and he publicly recanted his own paper in a public letter addressed to the editor of *Archives of Sexual Behavior* in the spring of 2012 (Carey, 2012). In this letter, Spitzer wrote,

I was considering writing something that would acknowledge that I now judge the major critiques of the study as largely correct. . . . I believe I owe the gay community an apology for my study making unproven claims of the efficacy of reparative therapy. I also apologize to any gay person who wasted time or energy undergoing some form of reparative therapy because they believed that I had proven that reparative therapy works with some “highly motivated” individuals. (Becker, 2012, pars. 2, 5)

Citing research that suggests not only that gay conversion therapy is ineffective, but also potentially harmful, legislative efforts to make such therapy illegal have either been enacted (e.g., it is now illegal in California) or are underway across the United States, and many professional organizations have issued statements against this practice (Human Rights Campaign, n.d.)

Read this draft of Dr. Spitzer’s letter: EXCLUSIVE: [Dr. Robert Spitzer Apologizes to Gay Community for Infamous “Ex-Gay” Study](#).

Gender Identity

Many people conflate sexual orientation with gender identity because of stereotypical attitudes that exist about homosexuality. In reality, these are two related, but different, issues. Gender identity refers to one’s sense of being male or female. Generally, our gender identities correspond to our chromosomal and phenotypic sex,

but this is not always the case. When individuals do not feel comfortable identifying with the gender associated with their biological sex, then they experience gender dysphoria. **Gender dysphoria** is a *diagnostic category in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) that describes individuals who do not identify as the gender that most people would assume they are.* This dysphoria must persist for at least six months and result in significant distress or dysfunction to meet DSM-5 diagnostic criteria. In order for children to be assigned this diagnostic category, they must verbalize their desire to become the other gender.

Many people who are classified as gender dysphoric seek to live their lives in ways that are consistent with their own gender identity. This involves dressing in opposite-sex clothing and assuming an opposite-sex identity. These individuals may also undertake **transgender hormone therapy** in an attempt to make their bodies look more like the opposite sex, and in some cases, they elect to have surgeries to alter the appearance of their external genitalia to resemble that of their gender identity. While these may sound like drastic changes, gender dysphoric individuals take these steps because their bodies seem to them to be a mistake of nature, and they seek to correct this mistake.



(a)



(b)

Chaz Bono, a transgender male, is a well-known person who transitioned from female to male. (a) In the 1970s, the world knew Chaz as Chastity Bono, the daughter of the famous entertaining duo Sonny and Cher; here young Chastity is pictured with Sonny. (b) Later in life, Chaz transitioned to align his physical body with his gender identity. (credit b: modification of work by “dvsross”/Flickr)

Check Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=723#h5p-192>

Cultural Factors in Sexual Orientation and Gender Identity

Issues related to sexual orientation and gender identity are very much influenced by sociocultural factors. Even the ways in which we define sexual orientation and gender vary from one culture to the next. While in the United States exclusive heterosexuality is viewed as the norm, there are societies that have different attitudes regarding homosexual behavior. In fact, in some instances, periods of exclusively homosexual behavior are socially prescribed as a part of normal development and maturation. For example, in parts of New Guinea, young boys are expected to engage in sexual behavior with other boys for a given period of time because it is believed that doing so is necessary for these boys to become men (Baldwin & Baldwin, 1989).

There is a two-gendered culture in the United States. We tend to classify an individual as either male or female. However, in some cultures there are additional gender variants resulting in more than two gender categories. For example, in Thailand, you can be male, female, or kathoey. A kathoey is an individual who would be described as intersexed or transgendered in the United States (Tangmunkongvorakul, Banwell, Carmichael, Utomo, & Sleigh, 2010).

THE CASE OF DAVID REIMER

In August of 1965, Janet and Ronald Reimer of Winnipeg, Canada, welcomed the birth of their twin sons,

Bruce and Brian. Within a few months, the twins were experiencing urinary problems; doctors recommended the problems could be alleviated by having the boys circumcised. A malfunction of the medical equipment used to perform the circumcision resulted in Bruce's penis being irreparably damaged. Distraught, Janet and Ronald looked to expert advice on what to do with their baby boy. By happenstance, the couple became aware of Dr. John Money at Johns Hopkins University and his theory of psychosexual neutrality (Colapinto, 2000).

Dr. Money had spent a considerable amount of time researching transgendered individuals and individuals born with ambiguous genitalia. As a result of this work, he developed a theory of psychosexual neutrality. His theory asserted that we are essentially neutral at birth with regard to our gender identity and that we don't assume a concrete gender identity until we begin to master language. Furthermore, Dr. Money believed that the way in which we are socialized in early life is ultimately much more important than our biology in determining our gender identity (Money, 1962).

Dr. Money encouraged Janet and Ronald to bring the twins to Johns Hopkins University, and he convinced them that they should raise Bruce as a girl. Left with few other options at the time, Janet and Ronald agreed to have Bruce's testicles removed and to raise him as a girl. When they returned home to Canada, they brought with them Brian and his "sister," Brenda, along with specific instructions to never reveal to Brenda that she had been born a boy (Colapinto, 2000).

Early on, Dr. Money shared with the scientific community the great success of this natural experiment that seemed to fully support his theory of psychosexual neutrality (Money, 1975). Indeed, in early interviews with the children it appeared that Brenda was a typical little girl who liked to play with "girly" toys and do "girly" things.

However, Dr. Money was less than forthcoming with information that seemed to argue against the success of the case. In reality, Brenda's parents were constantly concerned that their little girl wasn't really behaving as most girls did, and by the time Brenda was nearing adolescence, it was painfully obvious to the family that she was really having a hard time identifying as a female. In addition, Brenda was becoming increasingly reluctant to continue her visits with Dr. Money to the point that she threatened suicide if her parents made her go back to see him again.

At that point, Janet and Ronald disclosed the true nature of Brenda's early childhood to their daughter. While initially shocked, Brenda reported that things made sense to her now, and ultimately, by the time she was an adolescent, Brenda had decided to identify as a male. Thus, she became David Reimer.

David was quite comfortable in his masculine role. He made new friends and began to think about his future. Although his castration had left him infertile, he still wanted to be a father. In 1990, David married a single mother and loved his new role as a husband and father. In 1997, David was made aware that Dr. Money was continuing to publicize his case as a success supporting his theory of psychosexual neutrality. This prompted David and his brother to go public with their experiences in an attempt to discredit the doctor's publications. While this revelation created a firestorm in the scientific community for Dr. Money, it also triggered a series of unfortunate events that ultimately led to David committing suicide in 2004 (O'Connell, 2004).

This sad story speaks to the complexities involved in gender identity. While the Reimer case had earlier been paraded as a hallmark of how socialization trumped biology in terms of gender identity, the truth of the story made the scientific and medical communities more cautious in dealing with cases that involve intersex children and how to deal with their unique circumstances. In fact, stories like this one have prompted measures to prevent unnecessary harm and suffering to children who might have issues with gender identity. For example, in 2013, a law took effect in Germany allowing parents of intersex children to classify their children as indeterminate so that children can self-assign the appropriate gender once they have fully developed their own gender identities (Paramaguru, 2013).

Watch this news story about the experiences of David Reimer and his family: [Circumcision Damage Leads to More Tragedy](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=723#oembed-1>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=723#h5p-193>

Critical Thinking Questions

While much research has been conducted on how an individual develops a given sexual orientation, many people question the validity of this research, citing that the participants used may not be representative. Why do you think this might be a legitimate concern? Given the stigma associated with being non-heterosexual, participants who openly identify as homosexual or bisexual in research projects may not be entirely representative of the non-heterosexual population as a whole.

There is no reliable scientific evidence that gay conversion therapy actually works. What kinds of evidence would you need to see in order to be convinced by someone arguing that she had successfully converted her sexual orientation?

Answers will vary, but it should be indicated that something more than self-reports of successful conversion would be necessary to support such a claim. Longitudinal, objective demonstrations of a real switch in both erotic attraction and the actual behavior in which the individual engaged would need to be presented in addition to assurances that this type of therapy was safe.

Personal Application Question

Issues related to sexual orientation have been at the forefront of the current political landscape. What do you think about current debates on legalizing same-sex marriage?

Summary

The hypothalamus and structures of the limbic system are important in sexual behavior and motivation. There is evidence to suggest that our motivation to engage in sexual behavior and our ability to do so are related, but separate, processes. While often confused, sexual orientation and gender identity are related, but distinct, concepts.

51.

EMOTION

Learning Objectives

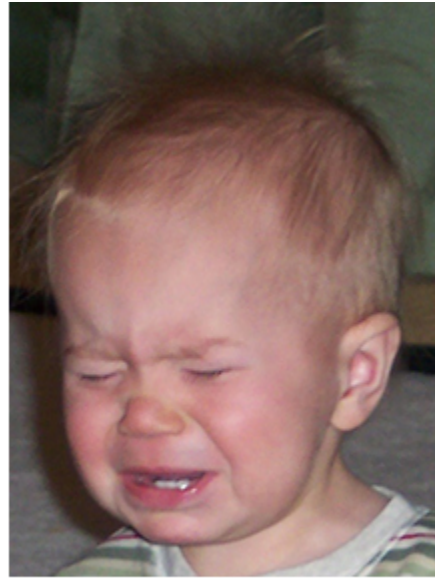
By the end of this section, you will be able to:

- Explain the major theories of emotion
- Describe the role that limbic structures play in emotional processing
- Understand the ubiquitous nature of producing and recognizing emotional expression

As we move through our daily lives, we experience a variety of emotions. An **emotion** *is a subjective state of being that we often describe as our feelings*. The words “emotion” and “mood” are sometimes used interchangeably, but psychologists use these words to refer to two different things. Typically, the word “emotion” indicates a subjective, affective state that is relatively intense and that occurs in response to something we experience. Emotions are often thought to be consciously experienced and intentional. Mood, on the other hand, refers to a prolonged, less intense, affective state that does not occur in response to something we experience. Mood states may not be consciously recognized and do not carry the intentionality that is associated with emotion (Beedie, Terry, Lane, & Devonport, 2011). Here we will focus on emotion, and you will learn more about mood in the chapter that covers psychological disorders.



(a)



(b)

Toddlers can cycle through emotions quickly, being (a) extremely happy one moment and (b) extremely sad the next. (credit a: modification of work by Kerry Ceszyk; credit b: modification of work by Kerry Ceszyk)

We can be at the heights of joy or in the depths of despair. We might feel angry when we are betrayed, fear when we are threatened, and surprised when something unexpected happens. This section will outline some of the most well-known theories explaining our emotional experience and provide insight into the biological bases of emotion. This section closes with a discussion of the ubiquitous nature of facial expressions of emotion and our abilities to recognize those expressions in others.

Theories of Emotion

*Our emotional states are combinations of physiological arousal, psychological appraisal, and subjective experiences. Together, these are known as the **components of emotion**.* These appraisals are informed by our experiences, backgrounds, and cultures. Therefore, different people may have different emotional experiences even when faced with similar circumstances. Over time, several different theories of emotion have been proposed to explain how the various components of emotion interact with one another.

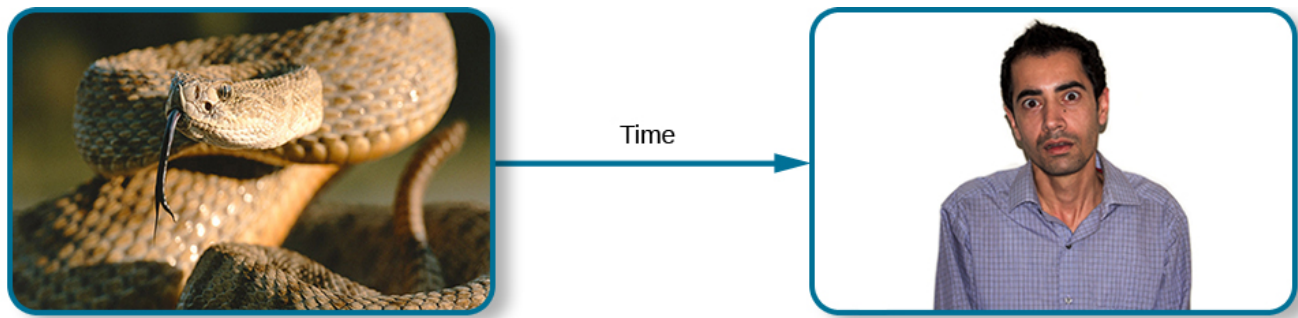
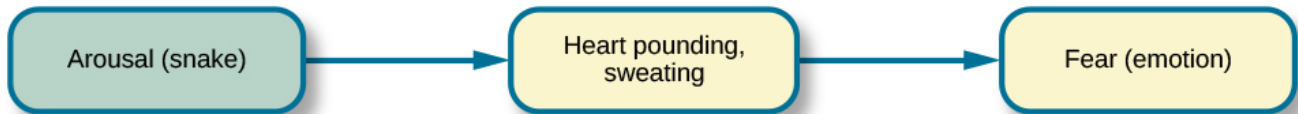
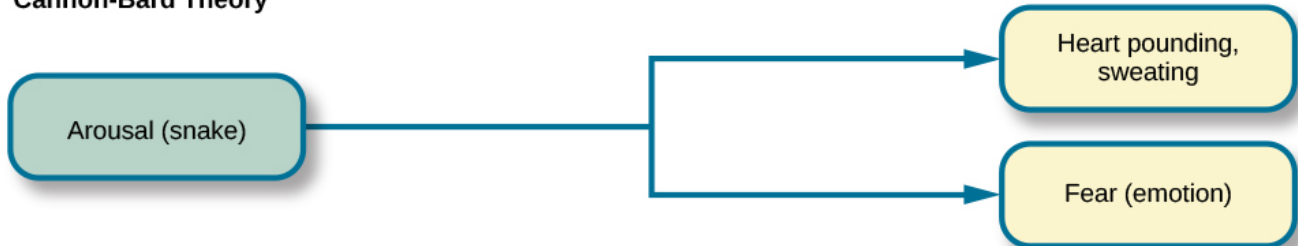
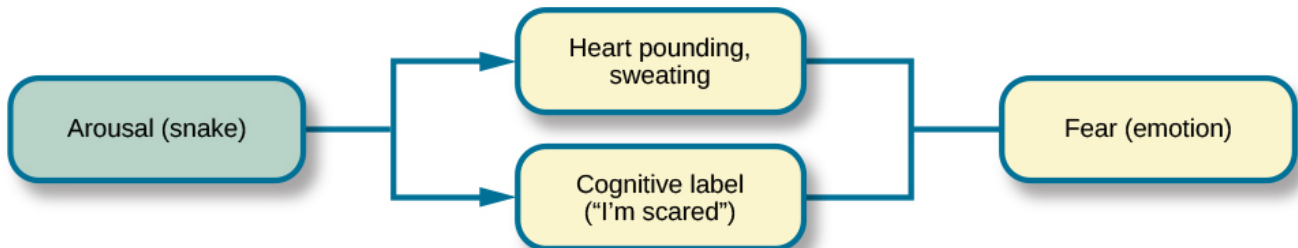
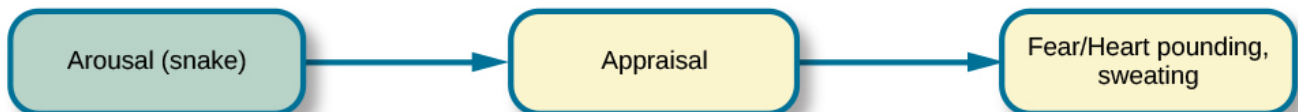
The **James-Lange theory of emotion** *asserts that emotions arise from physiological arousal*. Recall what you have learned about the sympathetic nervous system and our fight or flight response when threatened. If you were to encounter some threat in your environment, like a venomous snake in your backyard, your sympathetic nervous system would initiate significant physiological arousal, which would make your heart race and increase your respiration rate. According to the James-Lange theory of emotion, you would only

experience a feeling of fear after this physiological arousal had taken place. Furthermore, different arousal patterns would be associated with different feelings.

Other theorists, however, doubted that the physiological arousal that occurs with different types of emotions is distinct enough to result in the wide variety of emotions that we experience. Thus, the Cannon-Bard theory of emotion was developed. According to this view, physiological arousal and emotional experience occur simultaneously, yet independently (Lang, 1994). So, when you see the venomous snake, you feel fear at exactly the same time that your body mounts its fight or flight response. This emotional reaction would be separate and independent of the physiological arousal, even though they co-occur.

The James-Lange and Cannon-Bard theories have each garnered some empirical support in various research paradigms. For instance, Chwalisz, Diener, and Gallagher (1988) conducted a study of the emotional experiences of people who had spinal cord injuries. They reported that individuals who were incapable of receiving autonomic feedback because of their injuries still experienced emotion; however, there was a tendency for people with less awareness of autonomic arousal to experience less intense emotions. More recently, research investigating the **facial feedback hypothesis** *suggested that suppression of facial expression of emotion lowered the intensity of some emotions experienced by participants* (Davis, Senghas, & Ochsner, 2009). In both of these examples, neither theory is fully supported because physiological arousal does not seem to be necessary for the emotional experience, but this arousal does appear to be involved in enhancing the intensity of the emotional experience.

The **Schachter-Singer two-factor theory of emotion** is another variation on theories of emotions that takes into account both physiological arousal and the emotional experience. According to this theory, *emotions are composed of two factors: physiological and cognitive*. In other words, physiological arousal is interpreted in context to produce the emotional experience. In revisiting our example involving the venomous snake in your backyard, the two-factor theory maintains that the snake elicits sympathetic nervous system activation that is labeled as fear given the context, and our experience is that of fear.

**James-Lange Theory****Cannon-Bard Theory****Schachter-Singer Two-Factor Theory****Lazarus' Cognitive-mediational Theory**

This figure illustrates the major assertions of the James-Lange, Cannon-Bard, and Schachter-Singer two-factor theories of emotion. (credit "snake": modification of work by "tableatny"/Flickr; credit "face": modification of work by Cory Zanker)

It is important to point out that Schachter and Singer believed that physiological arousal is very similar across the different types of emotions that we experience, and therefore, the cognitive appraisal of the situation is

critical to the actual emotion experienced. In fact, it might be possible to misattribute arousal to an emotional experience if the circumstances were right (Schachter & Singer, 1962).

To test their idea, Schachter and Singer performed a clever experiment. Male participants were randomly assigned to one of several groups. Some of the participants received injections of epinephrine that caused bodily changes that mimicked the fight-or-flight response of the sympathetic nervous system; however, only some of these men were told to expect these reactions as side effects of the injection. The other men that received injections of epinephrine were told either that the injection would have no side effects or that it would result in a side effect unrelated to a sympathetic response, such as itching feet or headache. After receiving these injections, participants waited in a room with someone else they thought was another subject in the research project. In reality, the other person was a confederate of the researchers. The confederate engaged in scripted displays of euphoric or angry behavior (Schachter & Singer, 1962).

When those subjects who were told that they should expect to feel symptoms of physiological arousal were asked about any emotional changes that they had experienced related to either euphoria or anger (depending on how their confederate behaved), they reported none. However, the men who weren't expecting physiological arousal as a function of the injection were more likely to report that they experienced euphoria or anger as a function of their assigned confederate's behavior. While everyone that received an injection of epinephrine experienced the same physiological arousal, only those who were not expecting the arousal used context to interpret the arousal as a change in emotional state (Schachter & Singer, 1962).

Strong emotional responses are associated with strong physiological arousal. This has led some to suggest that the signs of physiological arousal, which include increased heart rate, respiration rate, and sweating, might serve as a tool to determine whether someone is telling the truth or not. The assumption is that most of us would show signs of physiological arousal if we were being dishonest with someone. A **polygraph**, or *lie detector test*, measures the physiological arousal of an individual responding to a series of questions. Someone trained in reading these tests would look for answers to questions that are associated with increased levels of arousal as potential signs that the respondent may have been dishonest on those answers. While polygraphs are still commonly used, their validity and accuracy are highly questionable because there is no evidence that lying is associated with any particular pattern of physiological arousal (Saxe & Ben-Shakhar, 1999).

The relationship between our experiencing of emotions and our cognitive processing of them, and the order in which these occur, remains a topic of research and debate. Lazarus (1991) developed the **cognitive-mediational theory** that asserts our emotions are determined by our appraisal of the stimulus. This appraisal mediates between the stimulus and the emotional response, and it is immediate and often unconscious. In contrast to the Schachter-Singer model, the appraisal precedes a cognitive label. You will learn more about Lazarus's appraisal concept when you study stress, health, and lifestyle.

Two other prominent views arise from the work of Robert Zajonc and Joseph LeDoux. Zajonc asserted that some emotions occur separately from or prior to our cognitive interpretation of them, such as feeling fear in response to an unexpected loud sound (Zajonc, 1998). He also believed in what we might casually refer to as a gut feeling—that we can experience an instantaneous and unexplainable like or dislike for someone

or something (Zajonc, 1980). LeDoux also views some emotions as requiring no cognition: some emotions completely bypass contextual interpretation. His research into the neuroscience of emotion has demonstrated the amygdala's primary role in fear (Cunha, Monfils, & LeDoux, 2010; LeDoux 1996, 2002). A fear stimulus is processed by the brain through one of two paths: from the thalamus (where it is perceived) directly to the amygdala or from the thalamus through the cortex and then to the amygdala. The first path is quick, while the second enables more processing about details of the stimulus. In the following section, we will look more closely at the neuroscience of emotional response.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=725#h5p-195>

Supplemental Video

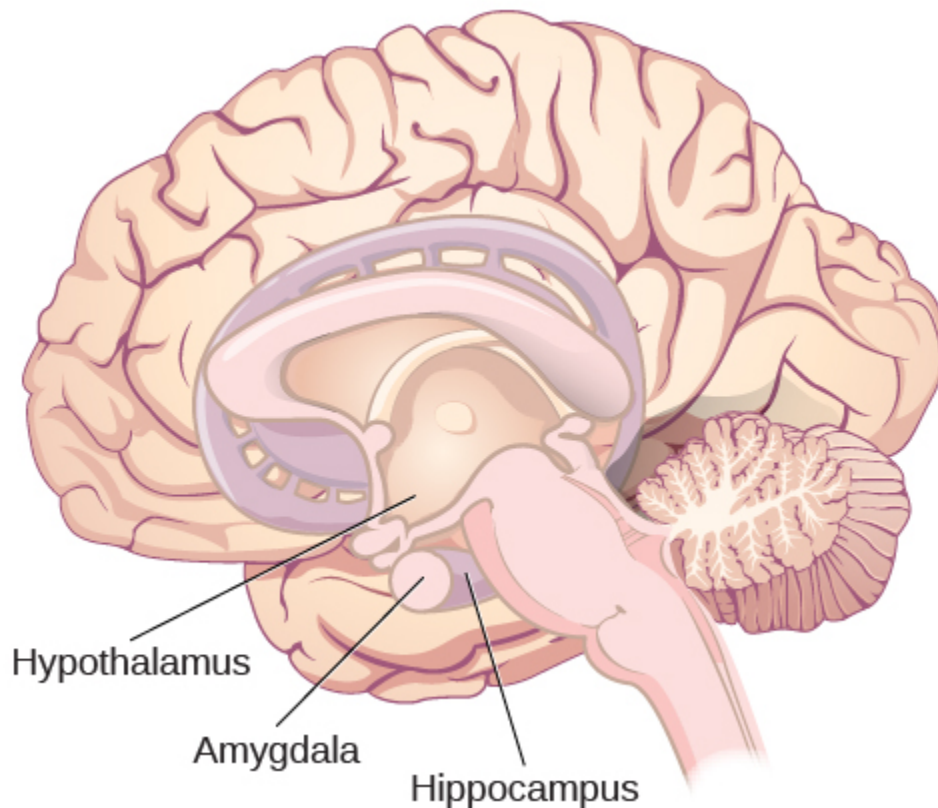


An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=725#h5p-196>

The Biology of Emotions

Earlier, you learned about the limbic system, which is the area of the brain involved in emotion and memory. The limbic system includes the hypothalamus, thalamus, amygdala, and the hippocampus. The hypothalamus plays a role in the activation of the sympathetic nervous system that is a part of any given emotional reaction. The thalamus serves as a sensory relay center whose neurons project to both the amygdala and the higher cortical regions for further processing. The amygdala plays a role in processing emotional information and sending that information on to cortical structures (Fossati, 2012). The hippocampus integrates emotional experience with cognition (Femenía, Gómez-Galán, Lindskog, & Magara, 2012).

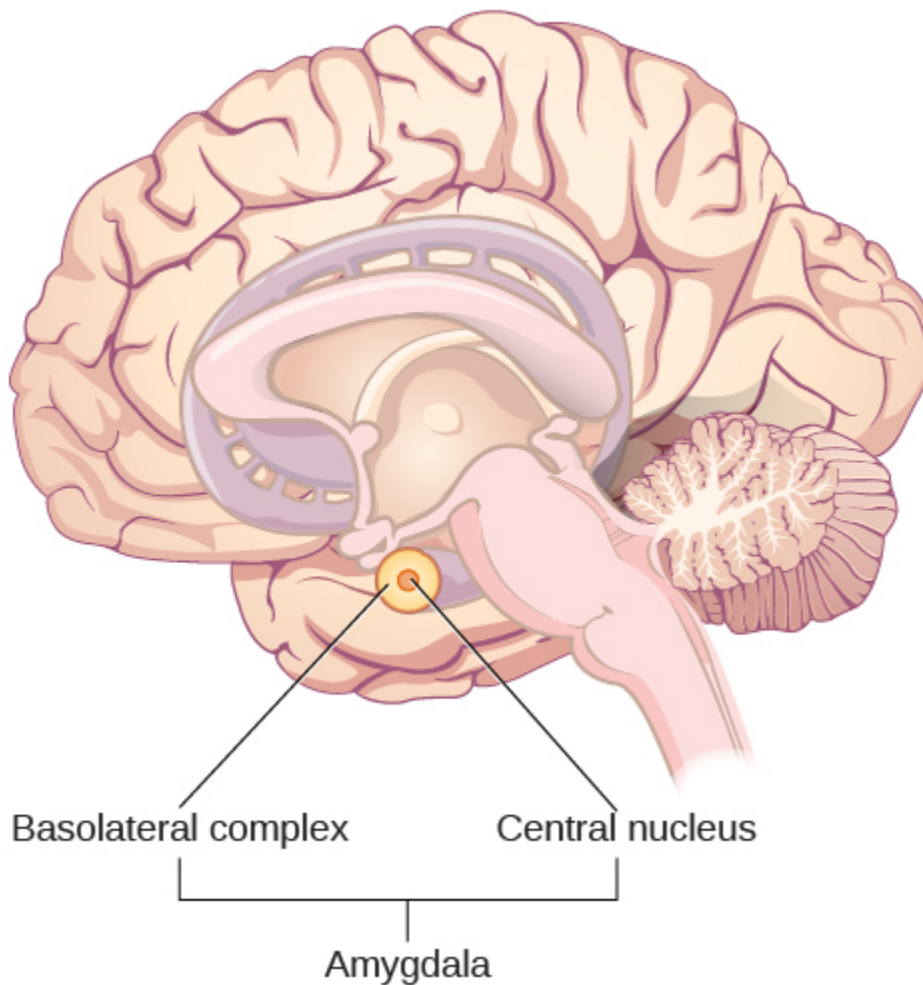


The limbic system, which includes the hypothalamus, thalamus, amygdala, and the hippocampus, is involved in mediating emotional response and memory.

Work through this Open Colleges interactive 3D brain simulator for a refresher on the brain's parts and their functions. To begin, click the "Start Exploring" button. To access the limbic system, click the plus sign in the right-hand menu (set of three tabs): [Open Colleges Interactive Brain](#).

Amygdala

The amygdala has received a great deal of attention from researchers interested in understanding the biological basis for emotions, especially fear and anxiety (Blackford & Pine, 2012; Goosens & Maren, 2002; Maren, Phan, & Liberzon, 2013). The amygdala is composed of various subnuclei, including the basolateral complex and the central nucleus. The **basolateral complex** *has dense connections with a variety of sensory areas of the brain. It is critical for classical conditioning and for attaching emotional value to learning processes and memory.* The **central nucleus** *plays a role in attention, and it has connections with the hypothalamus and various brainstem areas to regulate the autonomic nervous and endocrine systems' activity* (Pessoa, 2010).



The anatomy of the basolateral complex and central nucleus of the amygdala are illustrated in this diagram.

Animal research has demonstrated that there is increased activation of the amygdala in rat pups that have odor cues paired with electrical shock when their mother is absent. This leads to an aversion to the odor cue that suggests the rats learned to fear the odor cue. Interestingly, when the mother was present, the rats actually

showed a preference for the odor cue despite its association with an electrical shock. This preference was associated with no increases in amygdala activation. This suggests a differential effect on the amygdala by the *context* (the presence or absence of the mother) determined whether the pups learned to fear the odor or to be attracted to it (Moriceau & Sullivan, 2006).

Raineki, Cortés, Belnoue, and Sullivan (2012) demonstrated that, in rats, negative early life experiences could alter the function of the amygdala and result in adolescent patterns of behavior that mimic human mood disorders. In this study, rat pups received either abusive or normal treatment during postnatal days 8–12. There were two forms of abusive treatment. The first form of abusive treatment had an insufficient bedding condition. The mother rat had insufficient bedding material in her cage to build a proper nest that resulted in her spending more time away from her pups trying to construct a nest and less time nursing her pups. The second form of abusive treatment had an associative learning task that involved pairing odors and an electrical stimulus in the absence of the mother, as described above. The control group was in a cage with sufficient bedding and was left undisturbed with their mothers during the same time period. The rat pups that experienced abuse were much more likely to exhibit depressive-like symptoms during adolescence when compared to controls. These depressive-like behaviors were associated with increased activation of the amygdala.

Human research also suggests a relationship between the amygdala and psychological disorders of mood or anxiety. Changes in amygdala structure and function have been demonstrated in adolescents who are either at-risk or have been diagnosed with various mood and/or anxiety disorders (Miguel-Hidalgo, 2013; Qin et al., 2013). It has also been suggested that functional differences in the amygdala could serve as a biomarker to differentiate individuals suffering from bipolar disorder from those suffering from major depressive disorder (Fournier, Keener, Almeida, Kronhaus, & Phillips, 2013).

Hippocampus

As mentioned earlier, the hippocampus is also involved in emotional processing. Like the amygdala, research has demonstrated that hippocampal structure and function are linked to a variety of mood and anxiety disorders. Individuals suffering from posttraumatic stress disorder (PTSD) show marked reductions in the volume of several parts of the hippocampus, which may result from decreased levels of neurogenesis and dendritic branching (the generation of new neurons and the generation of new dendrites in existing neurons, respectively) (Wang et al., 2010). While it is impossible to make a causal claim with correlational research like this, studies have demonstrated behavioral improvements and hippocampal volume increases following either pharmacological or cognitive-behavioral therapy in individuals suffering from PTSD (Bremner & Vermetten, 2004; Levy-Gigi, Szabó, Kelemen, & Kéri, 2013).

Watch this video about research that demonstrates how the volume of the hippocampus can vary as a function of traumatic experiences: [BYU study finds brain shrinkage after traumatic events](#).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=725#h5p-197>

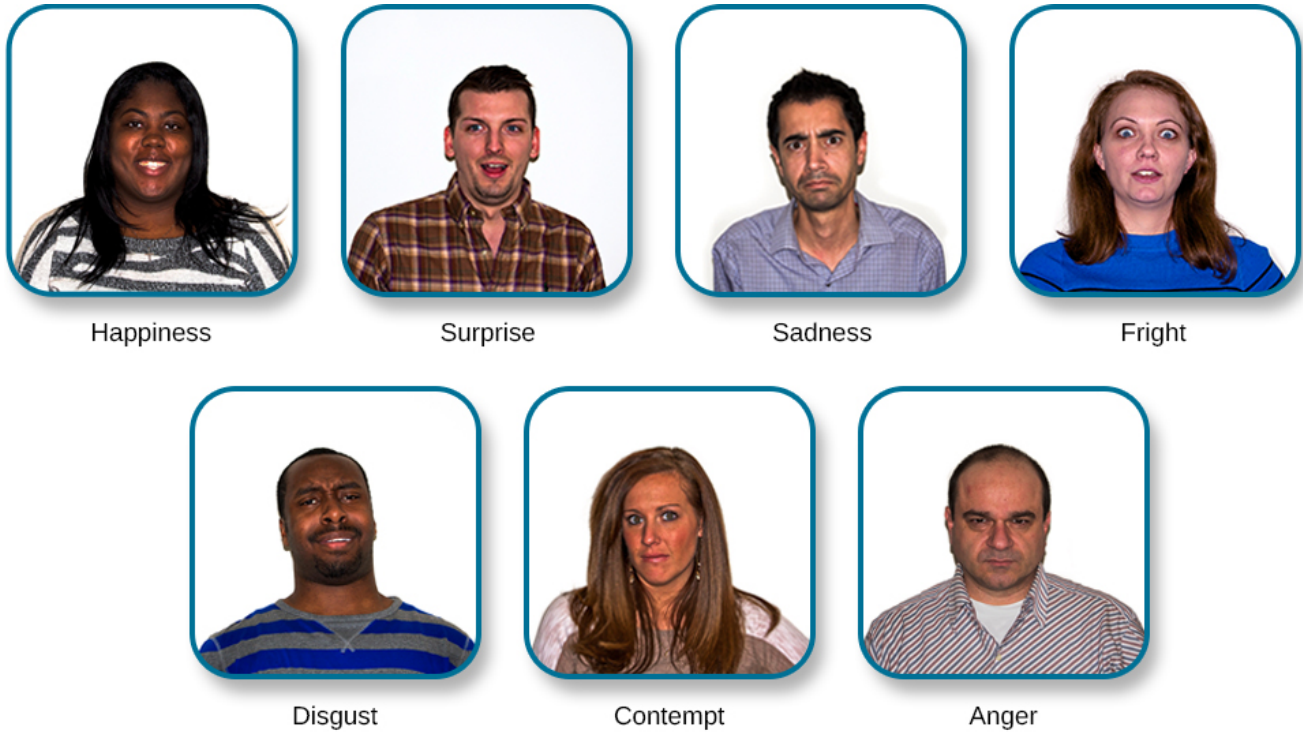
Facial Expression and Recognition of Emotions

Culture can impact the way in which people display emotion. A **cultural display rule** *is one of a collection of culturally specific standards that govern the types and frequencies of displays of emotions that are acceptable* (Malatesta & Haviland, 1982). Therefore, people from varying cultural backgrounds can have very different cultural display rules of emotion. For example, research has shown that individuals from the United States express negative emotions like fear, anger, and disgust both alone and in the presence of others, while Japanese individuals only do so while alone (Matsumoto, 1990). Furthermore, individuals from cultures that tend to emphasize social cohesion are more likely to engage in suppression of emotional reaction so they can evaluate which response is most appropriate in a given context (Matsumoto, Yoo, & Nakagawa, 2008).

Other distinct cultural characteristics might be involved in emotionality. For instance, there may be gender differences involved in emotional processing. While research into gender differences in emotional display is equivocal, there is some evidence that men and women may differ in regulation of emotions (McRae, Ochsner, Mauss, Gabrieli, & Gross, 2008).

Despite different emotional display rules, our ability to recognize and produce facial expressions of emotion appears to be universal. In fact, even congenitally blind individuals produce the same facial expression of

emotions, despite their never having the opportunity to observe these facial displays of emotion in other people. This would seem to suggest that the pattern of activity in facial muscles involved in generating emotional expressions is universal, and indeed, this idea was suggested in the late 19th century in Charles Darwin's book *The Expression of Emotions in Man and Animals* (1872). In fact, there is substantial evidence for seven universal emotions that are each associated with distinct facial expressions. These include happiness, surprise, sadness, fright, disgust, contempt, and anger (Ekman & Keltner, 1997).



The seven universal facial expressions of emotion are shown. (credit: modification of work by Cory Zanker)

Does smiling make you happy? Or does being happy make you smile? The facial feedback hypothesis asserts that facial expressions are capable of influencing our emotions, meaning that smiling can make you feel happier (Buck, 1980; Soussignan, 2001; Strack, Martin, & Stepper, 1988). Recent research explored how Botox, which paralyzes facial muscles and limits facial expression, might affect emotion. Havas, Glenberg, Gutowski, Lucarelli, and Davidson (2010) discovered that depressed individuals reported less depression after paralysis of their frowning muscles with Botox injections.

Of course, emotion is not only displayed through facial expressions. We also use the tone of our voices, various behaviors, and body language to communicate information about our emotional states. **Body language** is the expression of emotion in terms of body position or movement. Research suggests that we are quite sensitive to the emotional information communicated through body language, even if we're not consciously aware of it (de Gelder, 2006; Tamietto et al., 2009).

Watch this short [History Channel video](#) about body language to see how it plays out in the tense situation of a political debate: [Decoding debate body language](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=725#oembed-1>

To apply these same concepts to the more everyday situations most of us face, check out these tips from an interview on the show [Today](#) with body language expert Janine Driver.

AUTISM SPECTRUM DISORDER AND EXPRESSION OF EMOTIONS

Autism spectrum disorder (ASD) is a *set of neurodevelopmental disorders characterized by repetitive behaviors and communication and social problems*. Children who have autism spectrum disorders have difficulty recognizing the emotional states of others, and research has shown that this may stem from an inability to distinguish various nonverbal expressions of emotion (i.e., facial expressions) from one another (Hobson, 1986). In addition, there is evidence to suggest that autistic individuals also have difficulty expressing emotion through tone of voice and by producing facial expressions (Macdonald et al., 1989). Difficulties with emotional recognition and expression may contribute to the impaired social interaction and communication that characterize autism; therefore, various therapeutic approaches have been explored to address these difficulties. Various educational curricula, cognitive-behavioral therapies, and pharmacological therapies have shown some promise in helping autistic individuals process emotionally relevant information (Bauminger, 2002; Golan & Baron-Cohen, 2006; Guastella et al., 2010).

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=725#h5p-198>

Critical Thinking Questions

Imagine you find a venomous snake crawling up your leg just after taking a drug that prevented sympathetic nervous system activation. What would the James-Lange theory predict about your experience?

The James-Lange theory would predict that I would not feel fear because I haven't had the physiological arousal necessary to induce that emotional state.

Why can we not make causal claims regarding the relationship between the volume of the hippocampus and PTSD?

The research that exists is correlational in nature. It could be the case that reduced hippocampal volume predisposes people to develop PTSD or the decreased volume could result from PTSD. Causal claims can only be made when performing an experiment.

Personal Application Question

Think about times in your life when you have been absolutely elated (e.g., perhaps your school's basketball team just won a closely contested game for the national championship) and very fearful (e.g., you are about to give a speech in your public speaking class to a roomful of 100 strangers). How would you describe how your

arousal manifested itself physically? Were there marked differences in physiological arousal associated with each emotional state?

Summary

Emotions are subjective experiences that consist of physiological arousal and cognitive appraisal. Various theories have been put forward to explain our emotional experiences. The James-Lange theory asserts that emotions arise as a function of physiological arousal. The **Cannon-Bard theory** *maintains that emotional experience occurs simultaneous to and independent of physiological arousal.* The **Schachter-Singer two-factor theory** *suggests that physiological arousal receives cognitive labels as a function of the relevant context and that these two factors together result in an emotional experience.*

The limbic system is the brain's emotional circuit, which includes the amygdala and the hippocampus. Both of these structures are implicated in playing a role in normal emotional processing as well as in psychological mood and anxiety disorders. Increased amygdala activity is associated with learning to fear, and it is seen in individuals who are at risk for or suffering from mood disorders. The volume of the hippocampus has been shown to be reduced in individuals suffering from posttraumatic stress disorder.

The ability to produce and recognize facial expressions of emotions seems to be universal regardless of cultural background. However, there are cultural display rules which influence how often and under what circumstances various emotions can be expressed. Tone of voice and body language also serve as a means by which we communicate information about our emotional states.

52.

REFERENCES

- Ahima, R. S., & Antwi, D. A. (2008). Brain regulation of appetite and satiety. *Endocrinology and Metabolism Clinics of North America*, 37, 811–823.
- Allen, L. S., & Gorski, R. A. (1992). Sexual orientation and the size of the anterior commissure in the human brain. *Proceedings of the National Academy of Sciences, USA*, 89, 7199–7202.
- American Psychiatric Association. (2013). *Feeding and eating disorders*. Retrieved from <http://www.dsm5.org/documents/eating%20disorders%20fact%20sheet.pdf>
- Arnold, H. J. (1976). Effects of performance feedback and extrinsic reward upon high intrinsic motivation. *Organizational Behavior and Human Performance*, 17, 275–288.
- Bailey, M. J., & Pillard, R. C. (1991). A genetic study of male sexual orientation. *Archives of General Psychiatry*, 48, 1089–1096.
- Baldwin, J. D., & Baldwin, J. I. (1989). The socialization of homosexuality and heterosexuality in a non-western society. *Archives of Sexual Behavior*, 18, 13–29.
- Bancroft, J. (2004). Alfred C. Kinsey and the politics of sex research. *Annual Review of Sex Research*, 15, 1–39.
- Bandura, A. (1994). Self-efficacy. In V. S. Ramachandran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71–81). New York, NY: Academic Press.
- Bauminger, N. (2002). The facilitation of social-emotional understanding and social interaction in high-functioning children with autism: Intervention outcomes. *Journal of Autism and Developmental Disorders*, 32, 283–298.
- Becker, J. B., Rudick, C. N., & Jenkins, W. J. (2001). The role of dopamine in the nucleus accumbens and striatum during sexual behavior in the female rat. *Journal of Neuroscience*, 21, 3236–3241.
- Becker, J. M. (2012, April 25). Dr. Robert Spitzer apologizes to gay community for infamous “ex-gay” study [Web log post]. Retrieved from <http://www.truthwinsout.org/news/2012/04/24542/>
- Beedie, C. J., Terry, P. C., Lane, A. M., & Devonport, T. J. (2011). Differential assessment of emotions and moods: Development and validation of the emotion and mood components of anxiety questionnaire. *Personality and Individual Differences*, 50, 228–233.
- Bell, A. P., Weinberg, M. S., & Hammersmith, S. K. (1981). *Sexual preferences: Its development in men and women*. Bloomington, IN: Indiana University Press.
- Berlyne, D. E. (1960). Toward a theory of exploratory behavior: II. Arousal potential, perceptual curiosity,

and learning. In (Series Ed.), *Conflict, arousal, and curiosity* (pp. 193–227). New York, NY: McGraw-Hill Book Company.

Bhasin, S., Enzlin, P., Coviello, A., & Basson, R. (2007). Sexual dysfunction in men and women with endocrine disorders. *The Lancet*, *369*, 597–611.

Blackford, J. U., & Pine, D. S. (2012). Neural substrates of childhood anxiety disorders: A review of neuroimaging findings. *Child and Adolescent Psychiatric Clinics of North America*, *21*, 501–525.

Bremner, J. D., & Vermetten, E. (2004). Neuroanatomical changes associated with pharmacotherapy in posttraumatic stress disorder. *Annals of the New York Academy of Sciences*, *1032*, 154–157.

Buck, R. (1980). Nonverbal behavior and the theory of emotion: The facial feedback hypothesis. *Journal of Personality and Social Psychology*, *38*, 811–824.

Bullough, V. L. (1998). Alfred Kinsey and the Kinsey report: Historical overview and lasting contributions. *The Journal of Sex Research*, *35*, 127–131.

Byne, W., Tobet, S., Mattiace, L. A., Lasco, M. S., Kemether, E., Edgar, M. A., . . . Jones, L. B. (2001). The interstitial nuclei of the human anterior hypothalamus: An investigation of variation with sex, sexual orientation, and HIV status. *Hormones and Behavior*, *40*, 86–92.

Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research*, *64*, 363–423.

Carey, B. (2012, May 18). Psychiatry giant sorry for backing gay ‘cure.’ *The New York Times*. Retrieved from http://www.nytimes.com/2012/05/19/health/dr-robert-l-spitzer-noted-psychiatrist-apologizes-for-study-on-gay-cure.html?_r=0

Carter, C. S. (1992). Hormonal influences on human sexual behavior. In J. B. Becker, S. M. Breedlove, & D. Crews (Eds.), *Behavioral Endocrinology* (pp.131–142). Cambridge, MA: MIT Press.

Cassidy, S. B., & Driscoll, D. J. (2009). Prader-Willi syndrome. *European Journal of Human Genetics*, *17*, 3–13.

Centers for Disease Control and Prevention. (2012). *Overweight and obesity*. Retrieved from <http://www.cdc.gov/obesity/index.html>

Chwalisz, K., Diener, E., & Gallagher, D. (1988). Autonomic arousal feedback and emotional experience: Evidence from the spinal cord injured. *Journal of Personality and Social Psychology*, *54*, 820–828.

Colapinto, J. (2000). *As nature made him: The boy who was raised as a girl*. New York, NY: Harper Collins.

Collier, D. A., & Treasure, J. L. (2004). The aetiology of eating disorders. *The British Journal of Psychiatry*, *185*, 363–365.

Conrad, P. (2005). The shifting engines of medicalization. *Journal of Health and Social Behavior*, *46*, 3–14.

Cunha, C., Monfils, M. H., & LeDoux, J. E. (2010). GABA(C) receptors in the lateral amygdala: A possible novel target for the treatment of fear and anxiety disorders? *Frontiers in Behavioral Neuroscience*, *4*, 6.

Daniel, T. L., & Esser, J. K. (1980). Intrinsic motivation as influenced by rewards, task interest, and task structure. *Journal of Applied Psychology*, *65*, 566–573.

Darwin, C. (1872). *The expression of emotions in man and animals*. New York, NY: Appleton.

- Davis, J. I., Senghas, A., & Ochsner, K. N. (2009). How does facial feedback modulate emotional experience? *Journal of Research in Personality*, 43, 822–829.
- Deci, E. L. (1972). Intrinsic motivation, extrinsic reinforcement, and inequity. *Journal of Personality and Social Psychology*, 22, 113–120.
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125, 627–668.
- de Gelder, B. (2006). Towards the neurobiology of emotional body language. *Nature Reviews Neuroscience*, 7, 242–249.
- Drazen, D. L., & Woods, S. C. (2003). Peripheral signals in the control of satiety and hunger. *Current Opinion in Clinical Nutrition and Metabolic Care*, 5, 621–629.
- Druce, M. R., Small, C. J., & Bloom, S. R. (2004). Minireview: Gut peptides regulating satiety. *Endocrinology*, 145, 2660–2665.
- Ekman, P., & Keltner, D. (1997). Universal facial expressions of emotion: An old controversy and new findings. In U. Segerstråle & P. Molnár (Eds.), *Nonverbal communication: Where nature meets culture* (pp. 27–46). Mahwah, NJ: Lawrence Erlbaum.
- Everett, B. J. (1990). Sexual motivation: A neural and behavioural analysis of the mechanisms underlying appetitive and copulatory responses of male rats. *Neuroscience and Biobehavioral Reviews*, 14, 217–232.
- Faris, E. (1921). Are instincts data or hypotheses? *American Journal of Sociology*, 27, 184–196.
- Femenía, T., Gómez-Galán, M., Lindskog, M., & Magara, S. (2012). Dysfunctional hippocampal activity affects emotion and cognition in mood disorders. *Brain Research*, 1476, 58–70.
- Fossati, P. (2012). Neural correlates of emotion processing: From emotional to social brain. *European Neuropsychopharmacology*, 22, S487–S491.
- Fournier, J. C., Keener, M. T., Almeida, J., Kronhaus, D. M., & Phillips, M. L. (2013). Amygdala and whole-brain activity to emotional faces distinguishes major depressive disorder and bipolar disorder. *Bipolar Disorders*. Advance online publication. doi:10.1111/bdi.12106
- Francis, N. H., & Kritsonis, W. A. (2006). A brief analysis of Abraham Maslow's original writing of *Self-Actualizing People: A Study of Psychological Health*. *Doctoral Forum National Journal of Publishing and Mentoring Doctoral Student Research*, 3, 1–7.
- Gloy, V. L., Briel, M., Bhatt, D. L., Kashyap, S. R., Schauer, P. R., Mingrone, G., . . . Nordmann, A. J. (2013, October 22). Bariatric surgery versus non-surgical treatment for obesity: A systematic review and meta-analysis of randomized controlled trials. *BMJ*, 347. doi:http://dx.doi.org/10.1136/bmj.f5934
- Golan, O., & Baron-Cohen, S. (2006). Systemizing empathy: Teaching adults with Asperger syndrome or high-functioning autism to recognize complex emotions using interactive multimedia. *Development and Psychopathology*, 18, 591–617.
- Goosens, K. A., & Maren, S. (2002). Long-term potentiation as a substrate for memory: Evidence from studies of amygdaloid plasticity and Pavlovian fear conditioning. *Hippocampus*, 12, 592–599.

- Graham, S., & Weiner, B. (1996). Theories and principles of motivation. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 63–84). New York, NY: Routledge.
- Greary, N. (1990). Pancreatic glucagon signals postprandial satiety. *Neuroscience and Biobehavioral Reviews*, *14*, 323–328.
- Guastella, A. J., Einfeld, S. L., Gray, K. M., Rinehart, N. J., Tonge, B. J., Lambert, T. J., & Hickie, I. B. (2010). Intranasal oxytocin improves emotion recognition for youth with autism spectrum disorders. *Biological Psychiatry*, *67*, 692–694.
- Hall, J. A., & Kimura, D. (1994). Dermatoglyphic asymmetry and sexual orientation in men. *Behavioral Neuroscience*, *108*(6), 1203–1206.
- Hamer, D. H., Hu, S., Magnuson, V. L., Hu, N., & Pattatucci, A. M. (1993). A linkage between DNA markers on the X chromosome and male sexual orientation. *Science*, *261*, 321–327.
- Havas, D. A., Glenberg, A. M., Gutowski, K. A., Lucarelli, M. J., & Davidson, R. J. (2010). Cosmetic use of botulinum toxin-A affects processing of emotional language. *Psychological Science*, *21*, 895–900.
- Hobson, R. P. (1986). The autistic child's appraisal of expressions of emotion. *The Journal of Child Psychology and Psychiatry*, *27*, 321–342.
- Hock, R. R. (2008). Emotion and Motivation. In *Forty studies that changed psychology: Explorations into the history of psychological research* (6th ed.) (pp. 158–168). Upper Saddle River, NJ: Pearson.
- Hu, S. H., Wei, N., Wang, Q. D., Yan, L. Q., Wei, E. Q., Zhang, M. M., . . . Xu, Y. (2008). Patterns of brain activation during visually evoked sexual arousal differ between homosexual and heterosexual men. *American Journal of Neuroradiology*, *29*, 1890–1896.
- Human Rights Campaign. (n.d.). *The lies and dangers of efforts to change sexual orientation or gender identity*. Retrieved from <http://www.hrc.org/resources/entry/the-lies-and-dangers-of-reparative-therapy>
- Jenkins, W. J. (2010). Can anyone tell me why I'm gay? What research suggests regarding the origins of sexual orientation. *North American Journal of Psychology*, *12*, 279–296.
- Jenkins, W. J., & Becker, J. B. (2001). Role of the striatum and nucleus accumbens in paced copulatory behavior in the female rat. *Behavioural Brain Research*, *121*, 19–28.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia, PA: W.B. Saunders Company.
- Koltko-Rivera, M. E. (2006). Rediscovering the later version of Maslow's hierarchy of needs: Self-transcendence and opportunities for theory, research, and unification. *Review of General Psychology*, *10*, 302–317.
- Konturek, S. J., Pepera, J., Zabielski, K., Konturek, P. C., Pawlick, T., Szlachcic, A., & Hahn. (2003). Brain-gut axis in pancreatic secretion and appetite control. *Journal of Physiology and Pharmacology*, *54*, 293–317.
- Lang, P. J. (1994). The varieties of emotional experience: A meditation on James-Lange theory. *Psychological Review*, *101*, 211–221.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York, NY: Oxford University Press.

- LeDoux, J. E. (1996). *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York, NY: Simon & Schuster.
- LeDoux, J. E. (2002). *The synaptic self*. London, UK: Macmillan.
- Leonard, G. (1982). The failure of self-actualization theory: A critique of Carl Rogers and Abraham Maslow. *Journal of Humanistic Psychology*, 22, 56–73.
- LeVay, S. (1991). A difference in the hypothalamic structure between heterosexual and homosexual men. *Science*, 253, 1034–1037.
- LeVay, S. (1996). *Queer science: The use and abuse of research into homosexuality*. Cambridge, MA: The MIT Press.
- Levy-Gigi, E., Szabó, C., Kelemen, O., & Kéri, S. (2013). Association among clinical response, hippocampal volume, and FKBP5 gene expression in individuals with posttraumatic stress disorder receiving cognitive behavioral therapy. *Biological Psychiatry*, 74, 793–800.
- Lippa, R. A. (2003). Handedness, sexual orientation, and gender-related personality traits in men and women. *Archives of Sexual Behavior*, 32, 103–114.
- Loehlin, J. C., & McFadden, D. (2003). Otoacoustic emissions, auditory evoked potentials, and traits related to sex and sexual orientation. *Archives of Sexual Behavior*, 32, 115–127.
- Macdonald, H., Rutter, M., Howlin, P., Rios, P., Conteur, A. L., Evered, C., & Folstein, S. (1989). Recognition and expression of emotional cues by autistic and normal adults. *Journal of Child Psychology and Psychiatry*, 30, 865–877.
- Malatesta, C. Z., & Haviland, J. M. (1982). Learning display rules: The socialization of emotion expression in infancy. *Child Development*, 53, 991–1003.
- Maren, S., Phan, K. L., & Liberzon, I. (2013). The contextual brain: Implications for fear conditioning, extinction and psychopathology. *Nature Reviews Neuroscience*, 14, 417–428.
- Martin-Gronert, M. S., & Ozanne, S. E. (2013). Early life programming of obesity. *Developmental Period Medicine*, 17, 7–12.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50, 370–396.
- Matsumoto, D. (1990). Cultural similarities and differences in display rules. *Motivation and Emotion*, 14, 195–214.
- Matsumoto, D., Yoo, S. H., & Nakagawa, S. (2008). Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology*, 94, 925–937.
- Mayo Clinic. (2012a). *Anorexia nervosa*. Retrieved from <http://www.mayoclinic.com/health/anorexia/DS00606>
- Mayo Clinic. (2012b). *Bulimia nervosa*. Retrieved from <http://www.mayoclinic.com/health/bulimia/DS00607>
- Mayo Clinic. (2013). *Gastric bypass surgery*. Retrieved from <http://www.mayoclinic.com/health/gastric-bypass/MY00825>

- McAdams, D. P., & Constantian, C. A. (1983). Intimacy and affiliation motives in daily living: An experience sampling analysis. *Journal of Personality and Social Psychology*, 45, 851–861.
- McClelland, D. C., & Liberman, A. M. (1949). The effect of need for achievement on recognition of need-related words. *Journal of Personality*, 18, 236–251.
- McFadden, D., & Champlin, C. A. (2000). Comparisons of auditory evoked potentials in heterosexual, homosexual, and bisexual males and females. *Journal of the Association for Research in Otolaryngology*, 1, 89–99.
- McFadden, D., & Pasanen, E. G. (1998). Comparisons of the auditory systems of heterosexuals and homosexuals: Clicked-evoked otoacoustic emissions. *Proceedings of the National Academy of Sciences, USA*, 95, 2709–2713.
- McRae, K., Ochsner, K. N., Mauss, I. B., Gabrieli, J. J. D., & Gross, J. J. (2008). Gender differences in emotion regulation: An fMRI study of cognitive reappraisal. *Group Processes and Intergroup Relations*, 11, 143–162.
- Miguel-Hidalgo, J. J. (2013). Brain structural and functional changes in adolescents with psychiatric disorders. *International Journal of Adolescent Medicine and Health*, 25, 245–256.
- Money, J. (1962). *Cytogenic and psychosexual incongruities with a note on space-form blindness*. Paper presented at the 118th meeting of the American Psychiatric Association, Toronto, Canada.
- Money, J. (1975). Ablatio penis: Normal male infant sex-reassigned as a girl. *Archives of Sexual Behavior*, 4, 65–71.
- Moriceau, S., & Sullivan, R. M. (2006). Maternal presence serves as a switch between learning fear and attraction in infancy. *Nature Neuroscience*, 9, 1004–1006.
- Murray, H. A., Barrett, W. G., Homburger, E., Langer, W. C., Mekeel, H. S., Morgan, C. D., . . . Wolf, R. E. (1938). *Explorations in personality: A clinical and experimental study of fifty men of college age*. New York, NY: Oxford University Press.
- Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, 7, 133–144.
- Novin, D., Robinson, K., Culbreth, L. A., & Tordoff, M. G. (1985). Is there a role for the liver in the control of food intake? *The American Journal of Clinical Nutrition*, 42, 1050–1062.
- O’Connell, S. (Writer/Producer). (2004). Dr. Money and the boy with no penis. [Television documentary series episode]. In *Horizon*. London, UK: BBC.
- Paramaguru, K. (2013, November). Boy, girl, or intersex? Germany adjusts to a third option at birth. *Time*. Retrieved from <http://world.time.com/2013/11/12/boy-girl-or-intersex/>
- Pessoa, L. (2010). Emotion and cognition and the amygdala: From “what is it?” to “what’s to be done?” *Neuropsychologia*, 48, 3416–3429.
- Pillard, R. C., & Bailey, M. J. (1995). A biologic perspective on sexual orientation. *The Psychiatric Clinics of North America*, 18(1), 71–84.

- Pillard, R. C., & Bailey, M. J. (1998). Sexual orientation has a heritable component. *Human Biology*, 70, 347–365.
- Ponseti, J., Bosinski, H. A., Wolff, S., Peller, M., Jansen, O., Mehdorn, H.M., . . . Siebner, H. R. (2006). A functional endophenotype for sexual orientation in humans. *Neuroimage*, 33(3), 825–833.
- Prader-Willi Syndrome Association. (2012). *What is Prader-Willi Syndrome?* Retrieved from <http://www.pwsausa.org/syndrome/index.htm>
- Qin, S., Young, C. B., Duan, X., Chen, T., Supekar, K., & Menon, V. (2013). Amygdala subregional structure and intrinsic functional connectivity predicts individual differences in anxiety during early childhood. *Biological Psychiatry*. Advance online publication. doi:10.1016/j.biopsych.2013.10.006
- Rahman, Q., & Wilson, G. D. (2003a). Large sexual-orientation-related differences in performance on mental rotation and judgment of line orientation tasks. *Neuropsychology*, 17, 25–31.
- Rahman, Q., & Wilson, G. D. (2003b). Sexual orientation and the 2nd to 4th finger length ratio: Evidence for organising effects of sex hormones or developmental instability? *Psychoneuroendocrinology*, 28, 288–303.
- Raineki, C., Cortés, M. R., Belnoue, L., & Sullivan, R. M. (2012). Effects of early-life abuse differ across development: Infant social behavior deficits are followed by adolescent depressive-like behaviors mediated by the amygdala. *The Journal of Neuroscience*, 32, 7758–7765.
- Rodriguez-Larralde, A., & Paradisi, I. (2009). Influence of genetic factors on human sexual orientation. *Investigacion Clinica*, 50, 377–391.
- Ross, M. W., & Arrindell, W. A. (1988). Perceived parental rearing patterns of homosexual and heterosexual men. *The Journal of Sex Research*, 24, 275–281.
- Saxe, L., & Ben-Shakhar, G. (1999). Admissibility of polygraph tests: The application of scientific standards post-Daubert. *Psychology, Public Policy, and Law*, 5, 203–223.
- Schachter, S., & Singer, J. E. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, 69, 379–399.
- Sherwin, B. B. (1988). A comparative analysis of the role of androgen in human male and female sexual behavior: Behavioral specificity, critical thresholds, and sensitivity. *Psychobiology*, 16, 416–425.
- Smink, F. R. E., van Hoeken, D., & Hoek, H. W. (2012). Epidemiology of eating disorders: Incidence, prevalence, and mortality rates. *Current Psychiatry Reports*, 14, 406–414.
- Soussignan, R. (2001). Duchenne smile, emotional experience, and autonomic reactivity: A test of the facial feedback hypothesis. *Emotion*, 2, 52–74.
- Speakman, J. R., Levitsky, D. A., Allison, D. B., Bray, M. S., de Castro, J. M., Clegg, D. J., . . . Westerterp-Plantenga, M. S. (2011). Set points, settling points and some alternative models: Theoretical options to understand how genes and environment combine to regulate body adiposity. *Disease Models & Mechanisms*, 4, 733–745.
- Strack, F., Martin, L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology*, 54, 768–777.

- Swaab, D. F., & Hofman, M. A. (1990). An enlarged suprachiasmatic nucleus in homosexual men. *Brain Research*, 537, 141–148.
- Tamietto, M., Castelli, L., Vighetti, S., Perozzo, P., Geminiani, G., Weiskrantz, L., & de Gelder, B. (2009). Unseen facial and bodily expressions trigger fast emotional reactions. *Proceedings of the National Academy of Sciences, USA*, 106, 17661–17666.
- Tangmunkongvorakul, A., Banwell, C., Carmichael, G., Utomo, I. D., & Sleigh, A. (2010). Sexual identities and lifestyles among non-heterosexual urban Chiang Mai youth: Implications for health. *Culture, Health, and Sexuality*, 12, 827–841.
- Wang, Z., Neylan, T. C., Mueller, S. G., Lenoci, M., Truran, D., Marmar, C. R., . . . Schuff, N. (2010). Magnetic resonance imaging of hippocampal subfields in posttraumatic stress disorder. *Arch Gen Psychiatry*, 67(3), 296–303. doi:10.1001/archgenpsychiatry.2009.205
- Weinsier, R. L., Nagy, T. R., Hunter, G. R., Darnell, B. E., Hensrud, D. D., & Weiss, H. L. (2000). Do adaptive changes in metabolic rate favor weight regain in weight-reduced individuals? An examination of the set-point theory. *The American Journal of Clinical Nutrition*, 72, 1088–1094.
- Woods, S. C. (2004). Gastrointestinal satiety signals I. An overview of gastrointestinal signals that influence food intake. *American Journal of Physiology: Gastrointestinal and Liver Physiology*, 286, G7–G13.
- Woods, S. C., & D'Alessio, D. A. (2008). Central control of body weight and appetite. *Journal of Clinical Endocrinology and Metabolism*, 93, S37–S50.
- Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18, 459–482. doi:10.1002/cne.920180503
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35(2), 151–175.
- Zajonc, R. B. (1998). Emotions. In D. T. Gilbert & S. T. Fiske (Eds.), *Handbook of social psychology* (4th ed., Vol. 1, pp. 591–632). New York, NY: McGraw-Hill.

PART XI

PERSONALITY



What makes two individuals have different personalities? (credit: modification of work by Nicolas Alejandro)

Three months before William Jefferson Blythe III was born, his father died in a car accident. He was raised by his mother, Virginia Dell, and grandparents, in Hope, Arkansas. When he turned 4, his mother married Roger Clinton, Jr., an alcoholic who was physically abusive to William's mother. Six years later, Virginia gave birth to another son, Roger. William, who later took the last name Clinton from his stepfather, became the 42nd president of the United States. While Bill Clinton was making his political ascendance, his half-brother, Roger Clinton, was arrested numerous times for drug charges, including possession, conspiracy to distribute cocaine, and driving under the influence, serving time in jail. Two brothers, raised by the same people, took radically different paths in their lives. Why did they make the choices they did? What internal forces shaped their decisions? Personality psychology can help us answer these questions and more.

53.

WHAT IS PERSONALITY?

Learning Objectives

By the end of this section, you will be able to:

- Define personality
- Describe early theories about personality development

Personality refers to the long-standing traits and patterns that propel individuals to consistently think, feel, and behave in specific ways. Our personality is what makes us unique individuals. Each person has an idiosyncratic pattern of enduring, long-term characteristics and a manner in which he or she interacts with other individuals and the world around them. Our personalities are thought to be long term, stable, and not easily changed. The word *personality* comes from the Latin word *persona*. In the ancient world, a persona was a mask worn by an actor. While we tend to think of a mask as being worn to conceal one's identity, the theatrical mask was originally used to either represent or project a specific personality trait of a character.

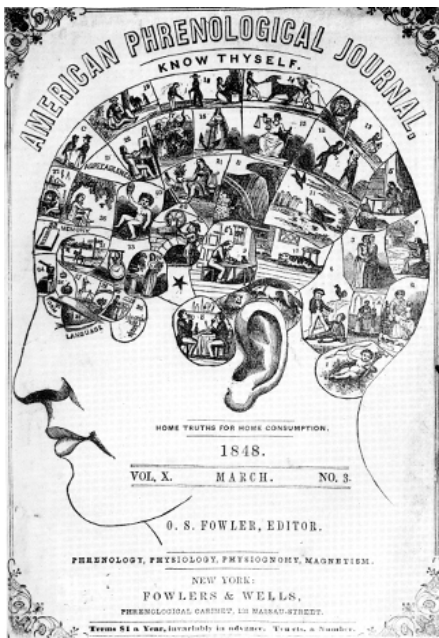


Happy, sad, impatient, shy, fearful, curious, helpful. What characteristics describe your personality?

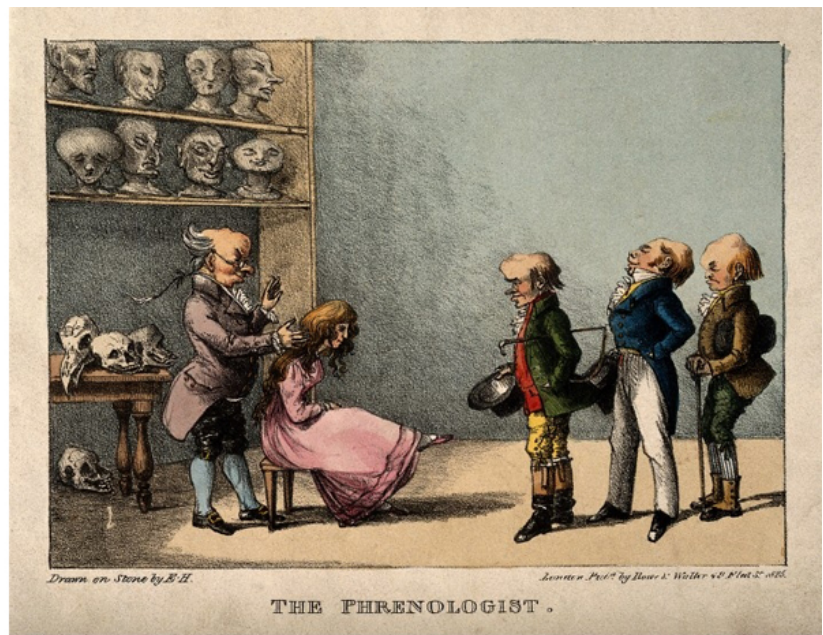
Historical Perspectives

The concept of personality has been studied for at least 2,000 years, beginning with Hippocrates in 370 BCE (Fazeli, 2012). Hippocrates theorized that personality traits and human behaviors are based on four separate temperaments associated with four fluids (“humors”) of the body: choleric temperament (yellow bile from the liver), melancholic temperament (black bile from the kidneys), sanguine temperament (red blood from the heart), and phlegmatic temperament (white phlegm from the lungs) (Clark & Watson, 2008; Eysenck & Eysenck, 1985; Lecci & Magnavita, 2013; Noga, 2007). Centuries later, the influential Greek physician and philosopher Galen built on Hippocrates’s theory, suggesting that both diseases and personality differences could be explained by imbalances in the humors and that each person exhibits one of the four temperaments. For example, the choleric person is passionate, ambitious, and bold; the melancholic person is reserved, anxious, and unhappy; the sanguine person is joyful, eager, and optimistic; and the phlegmatic person is calm, reliable, and thoughtful (Clark & Watson, 2008; Stelmack & Stalikas, 1991). Galen’s theory was prevalent for over 1,000 years and continued to be popular through the Middle Ages.

In 1780, Franz Gall, a German physician, proposed that the distances between bumps on the skull reveal a person’s personality traits, character, and mental abilities. According to Gall, measuring these distances revealed the sizes of the brain areas underneath, providing information that could be used to determine whether a person was friendly, prideful, murderous, kind, good with languages, and so on. Initially, phrenology was very popular; however, it was soon discredited for lack of empirical support and has long been relegated to the status of pseudoscience (Fancher, 1979).



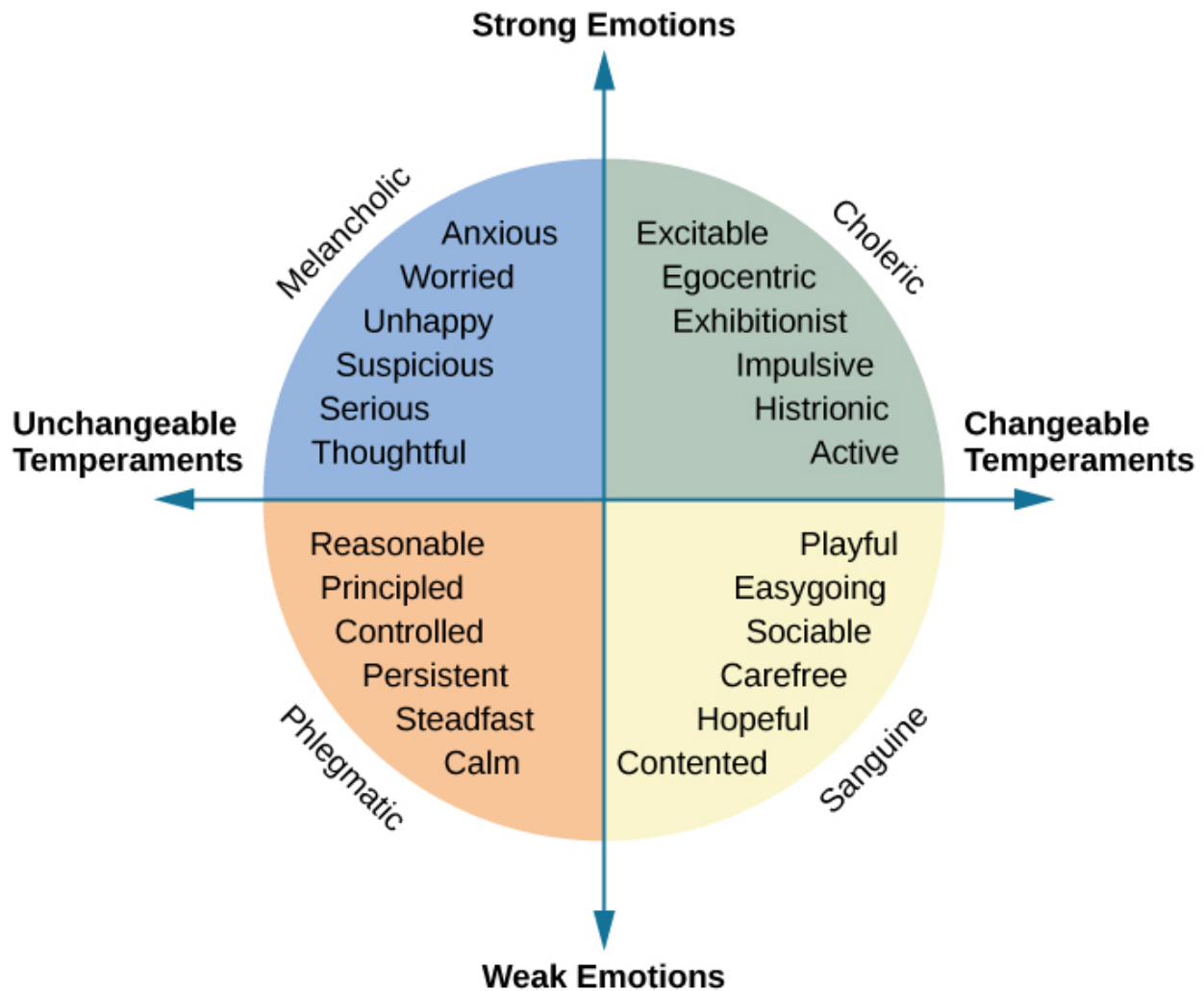
(a)



(b)

The pseudoscience of measuring the areas of a person's skull is known as phrenology. (a) Gall developed a chart that depicted which areas of the skull corresponded to particular personality traits or characteristics (Hothersall, 1995). (b) An 1825 lithograph depicts Gall examining the skull of a young woman. (credit b: modification of work by Wellcome Library, London)

In the centuries after Galen, other researchers contributed to the development of his four primary temperament types, most prominently Immanuel Kant (in the 18th century) and psychologist Wilhelm Wundt (in the 19th century) (Eysenck, 2009; Stelmack & Stalikas, 1991; Wundt, 1874/1886). Kant agreed with Galen that everyone could be sorted into one of the four temperaments and that there was no overlap between the four categories (Eysenck, 2009). He developed a list of traits that could be used to describe the personality of a person from each of the four temperaments. However, Wundt suggested that a better description of personality could be achieved using two major axes: emotional/nonemotional and changeable/unchangeable. The first axis separated strong from weak emotions (the melancholic and choleric temperaments from the phlegmatic and sanguine). The second axis divided the changeable temperaments (choleric and sanguine) from the unchangeable ones (melancholic and phlegmatic) (Eysenck, 2009).



Developed from Galen's theory of the four temperaments, Kant proposed trait words to describe each temperament. Wundt later suggested the arrangement of the traits on two major axes.

Sigmund Freud's psychodynamic perspective of personality was the first comprehensive theory of personality, explaining a wide variety of both normal and abnormal behaviors. According to Freud, unconscious drives influenced by sex and aggression, along with childhood sexuality, are the forces that influence our personality. Freud attracted many followers who modified his ideas to create new theories about personality. These theorists, referred to as neo-Freudians, generally agreed with Freud that childhood experiences matter, but they reduced the emphasis on sex and focused more on the social environment and effects of culture on personality. The perspective of personality proposed by Freud and his followers was the dominant theory of personality for the first half of the 20th century.

Other major theories then emerged, including the learning, humanistic, biological, evolutionary, trait, and cultural perspectives. In this chapter, we will explore these various perspectives on personality in depth.

View this video for a brief overview of some of the psychological perspectives on personality:

[Video Lecture: Explain the Major Perspectives on Personality.](#)



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=212#oembed-1>

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=212#h5p-53>

Summary

Personality has been studied for over 2,000 years, beginning with Hippocrates. More recent theories of personality have been proposed, including Freud's psychodynamic perspective, which holds that personality is formed through early childhood experiences. Other perspectives then emerged in reaction to the psychodynamic perspective, including the learning, humanistic, biological, trait, and cultural perspectives.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=212#h5p-54>

Critical Thinking Questions

What makes a personal quality part of someone's personality?
The particular quality or trait must be part of an enduring behavior pattern, so that it is a consistent or predictable quality.

Personal Application Questions

1. How would you describe your own personality? Do you think that friends and family would describe you in much the same way? Why or why not?
2. How would you describe your personality in an online dating profile?
3. What are some of your positive and negative personality qualities? How do you think these qualities will affect your choice of career?

Glossary



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=212#h5p-55>

Media Attributions

- “[Video Lecture: Explain the Major Perspectives on Personality](#)” by [wkeenecsu](#). Standard YouTube License.

54.

ORIGINS OF PERSONALITY

Learning Objectives

By the end of this section, you will be able to:

- Describe the strengths and limitations of the psychodynamic approach to explaining personality.
- Summarize the accomplishments of the neo-Freudians.
- Identify the major contributions of the humanistic approach to understanding personality.
- Describe the behaviorist, cognitive, and social cognitive perspectives on personality.

Although measures such as the Big Five and the Minnesota Multiphasic Personality Inventory (MMPI) are able to effectively assess personality, they do not say much about where personality comes from. In this section we will consider two major theories of the origin of personality: *psychodynamic* and *humanistic* approaches.

PSYCHODYNAMIC THEORIES OF PERSONALITY: THE ROLE OF THE UNCONSCIOUS

One of the most important psychological approaches to understanding personality is based on the theorizing of the Austrian physician and psychologist Sigmund Freud (1856–1939), who founded what today is known

as the psychodynamic approach to understanding personality. Many people know about Freud because his work has had a huge impact on our everyday thinking about psychology, and the psychodynamic approach is one of the most important approaches to psychological therapy (Roudinesco, 2003; Taylor, 2009). Freud is probably the best known of all psychologists, in part because of his impressive observation and analyses of personality (there are 24 volumes of his writings). As is true of all theories, many of Freud's ingenious ideas have turned out to be at least partially incorrect, and yet other aspects of his theories are still influencing psychology.

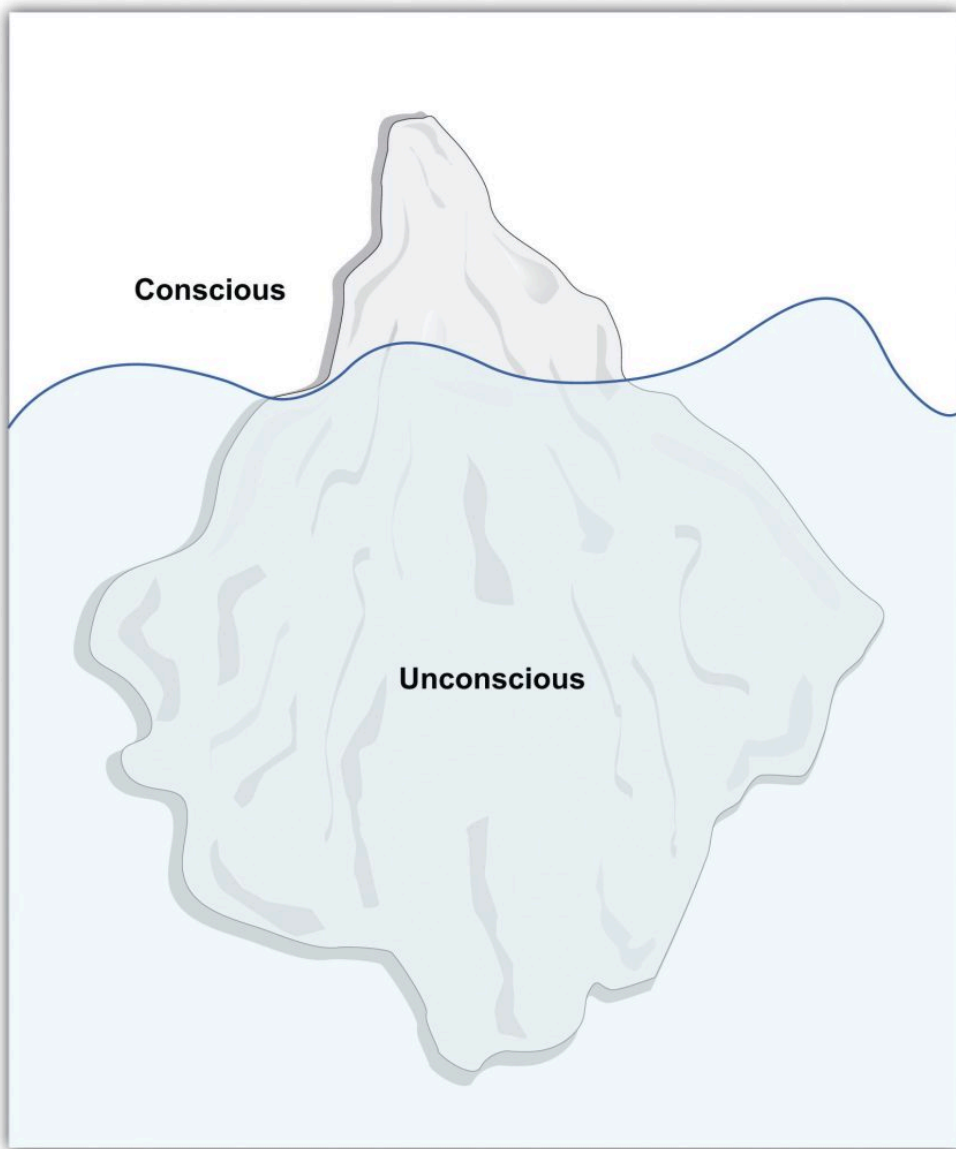
Freud was influenced by the work of the French neurologist Jean-Martin Charcot (1825–1893), who had been interviewing patients (almost all women) who were experiencing what was at the time known as *hysteria*. Although it is no longer used to describe a psychological disorder, hysteria at the time referred to a set of personality and physical symptoms that included chronic pain, fainting, seizures, and paralysis.

Charcot could find no biological reason for the symptoms. For instance, some women experienced a loss of feeling in their hands and yet not in their arms, and this seemed impossible given that the nerves in the arms are the same that are in the hands. Charcot was experimenting with the use of hypnosis, and he and Freud found that under hypnosis many of the hysterical patients reported having experienced a traumatic sexual experience, such as sexual abuse, as children (Dolnick, 1998).

Freud and Charcot also found that during hypnosis the remembering of the trauma was often accompanied by an outpouring of emotion, known as *catharsis*, and that following the catharsis the patient's symptoms were frequently reduced in severity. These observations led Freud and Charcot to conclude that these disorders were caused by psychological rather than physiological factors.

Freud used the observations that he and Charcot had made to develop his theory regarding the sources of personality and behavior, and his insights are central to the fundamental themes of psychology. In terms of free will, Freud did not believe that we were able to control our own behaviors. Rather, he believed that all behaviors are predetermined by motivations that lie outside our awareness, in the unconscious. These forces show themselves in our dreams, in neurotic symptoms such as obsessions, while we are under hypnosis, and in Freudian “slips of the tongue” in which people reveal their unconscious desires in language. Freud argued that we rarely understand why we do what we do, although we can make up explanations for our behaviors after the fact. For Freud the mind was like an iceberg, with the many motivations of the unconscious being much larger, but also out of sight, in comparison to the consciousness of which we are aware.

Mind as Iceberg



In Sigmund Freud's conceptualization of personality, the most important motivations are unconscious, just as the major part of an iceberg is underwater.

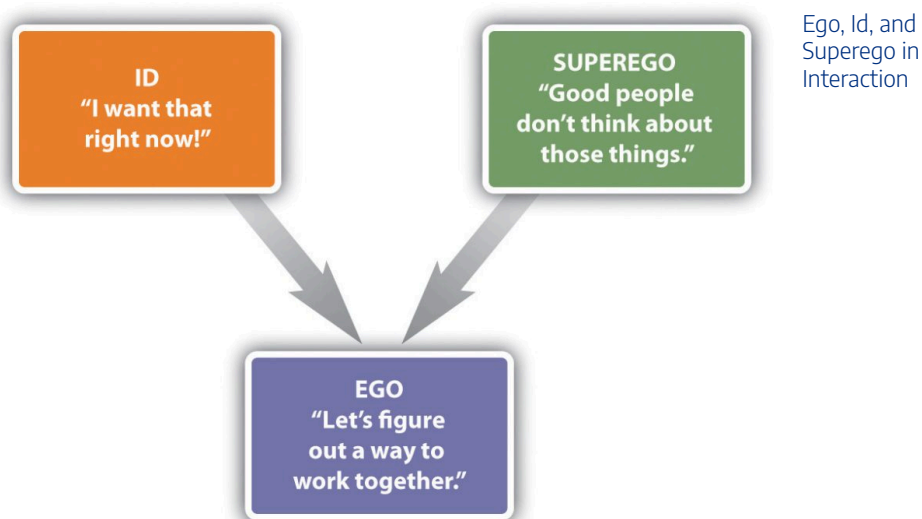
Id, Ego, and Superego

Freud proposed that the mind is divided into three components: *id*, *ego*, and *superego*, and that the interactions and conflicts among the components create personality (Freud, 1923/1943). According to Freudian theory, the **id** is *the component of personality that forms the basis of our most primitive impulses*. The id is entirely unconscious, and it drives our most important motivations, including the sexual drive (*libido*) and the aggressive or destructive drive (*Thanatos*). According to Freud, the id is driven by the *pleasure principle*—the

desire for immediate gratification of our sexual and aggressive urges. The id is why we smoke cigarettes, drink alcohol, view pornography, tell mean jokes about people, and engage in other fun or harmful behaviors, often at the cost of doing more productive activities.

In stark contrast to the id, the **superego** represents *our sense of morality and thoughts*. The superego tells us all the things that we shouldn't do, or the duties and obligations of society. The superego strives for perfection, and when we fail to live up to its demands, we feel guilty.

In contrast to the id, which is about the pleasure principle, the function of the *ego* is based on the *reality principle*—the idea that we must delay gratification of our basic motivations until the appropriate time with the appropriate outlet. The **ego** is *the largely conscious controller or decision-maker of personality*. The ego serves as the intermediary between the desires of the id and the constraints of society contained in the superego. We may wish to scream, yell, or hit, and yet our ego normally tells us to wait, reflect, and choose a more appropriate response.



Freud believed that psychological disorders, and particularly the experience of anxiety, occur when there is conflict or imbalance among the motivations of the id, ego, and superego. When the ego finds that the id is pressing too hard for immediate pleasure, it attempts to correct for this problem, often through the use of **defense mechanisms**—*unconscious psychological strategies used to cope with anxiety and to maintain a positive self-image*. Freud believed that the defense mechanisms were essential for effective coping with everyday life, but that any of them could be overused.

The Major Freudian Defense Mechanisms

Defense mechanism	Definition	Possible behavioral example
Displacement	Diverting threatening impulses away from the source of the anxiety and toward a more acceptable source	A student who is angry at her professor for a low grade lashes out at her roommate, who is a safer target of her anger.
Projection	Disguising threatening impulses by attributing them to others	A man with powerful unconscious sexual desires for women claims that women use him as a sex object.
Rationalization	Generating self-justifying explanations for our negative behaviors	A drama student convinces herself that getting the part in the play wasn't that important after all.
Reaction formation	Making unacceptable motivations appear as their exact opposite	Jane is sexually attracted to friend Jake, but she claims in public that she intensely dislikes him.
Regression	Retreating to an earlier, more childlike, and safer stage of development	A college student who is worried about an important test begins to suck on his finger.
Repression (or denial)	Pushing anxiety-arousing thoughts into the unconscious	A person who witnesses his parents having sex is later unable to remember anything about the event.
Sublimation	Channeling unacceptable sexual or aggressive desires into acceptable activities	A person participates in sports to sublimate aggressive drives. A person creates music or art to sublimate sexual drives.

The most controversial, and least scientifically valid, part of Freudian theory is its explanations of personality development. Freud argued that personality is developed through a series of *psychosexual stages*, each focusing on pleasure from a different part of the body. Freud believed that sexuality begins in infancy, and that the appropriate resolution of each stage has implications for later personality development.

Freud's Stages of Psychosexual Development

Stage	Approximate ages	Description
Oral	Birth to 18 months	Pleasure comes from the mouth in the form of sucking, biting, and chewing.
Anal	18 months to 3 years	Pleasure comes from bowel and bladder elimination and the constraints of toilet training.
Phallic	3 years to 6 years	Pleasure comes from the genitals, and the conflict is with sexual desires for the opposite-sex parent.
Latency	6 years to puberty	Sexual feelings are less important.
Genital	Puberty and older	If prior stages have been properly reached, mature sexual orientation develops.

In the first of Freud's proposed stages of psychosexual development, which begins at birth and lasts until about 18 months of age, the focus is on the mouth. During this *oral stage*, the infant obtains sexual pleasure by sucking and drinking. Infants who receive either too little or too much gratification become *fixated* or "locked" in the oral stage, and are likely to regress to these points of fixation under stress, even as adults. According to Freud, a child who receives too little oral gratification (e.g., who was underfed or neglected) will become *orally dependent* as an adult and be likely to manipulate others to fulfill his or her needs rather than becoming independent. On the other hand, the child who was overfed or overly gratified will resist growing up and try to return to the prior state of dependency by acting helpless, demanding satisfaction from others, and acting in a needy way.

The *anal stage*, lasting from about 18 months to 3 years of age, is when children first experience psychological conflict. During this stage children desire to experience pleasure through bowel movements, but they are also being toilet trained to delay this gratification. Freud believed that if this toilet training was either too harsh or too lenient, children would become fixated in the anal stage and become likely to regress to this stage under stress as adults. If the child received too little anal gratification (i.e., if the parents had been very harsh about toilet training), the adult personality will be *anal retentive*—stingy, with a compulsive seeking of order and tidiness. On the other hand, if the parents had been too lenient, the *anal expulsive* personality results, characterized by a lack of self-control and a tendency toward messiness and carelessness.

The *phallic stage*, which lasts from age 3 to age 6, is when the penis (for boys) and clitoris (for girls) become the primary erogenous zone for sexual pleasure. During this stage, Freud believed that children develop a powerful but unconscious attraction for the opposite-sex parent, as well as a desire to eliminate the same-sex parent as a rival. Freud based his theory of sexual development in boys (the "Oedipus complex") on the Greek mythological character Oedipus, who unknowingly killed his father and married his mother, and then put his own eyes out when he learned what he had done. Freud argued that boys will normally eventually abandon their love of the mother, and instead identify with the father, also taking on the father's personality characteristics, but that boys who do not successfully resolve the Oedipus complex will experience psychological problems later in life. Although it was not as important in Freud's theorizing, in girls the phallic stage is often termed the "Electra complex," after the Greek character who avenged her father's murder by killing her mother. Freud believed that girls frequently experienced *penis envy*, the sense of deprivation supposedly experienced by girls because they do not have a penis.

The *latency stage* is a period of relative calm that lasts from about 6 years to 12 years. During this time, Freud believed that sexual impulses were repressed, leading boys and girls to have little or no interest in members of the opposite sex.

The fifth and last stage, the *genital stage*, begins at about 12 years of age and lasts into adulthood. According to Freud, sexual impulses return during this time frame, and if development has proceeded normally to this point, the child is able to move into the development of mature romantic relationships. But if earlier problems have not been appropriately resolved, difficulties with establishing intimate love attachments are likely.

FREUD'S FOLLOWERS: THE NEO-FREUDIANS

Freudian theory was so popular that it led to a number of followers, including many of Freud's own students, who developed, modified, and expanded his theories. Taken together, these approaches are known as **neo-Freudian theories**. *The neo-Freudian theories are theories based on Freudian principles that emphasize the role of the unconscious and early experience in shaping personality but place less evidence on sexuality as the primary motivating force in personality and are more optimistic concerning the prospects for personality growth and change in personality in adults.*

Alfred Adler (1870–1937) was a follower of Freud who developed his own interpretation of Freudian theory. Adler proposed that the primary motivation in human personality was not sex or aggression, but rather the striving for superiority. According to Adler, we desire to be better than others and we accomplish this goal by creating a unique and valuable life. We may attempt to satisfy our need for superiority through our school or professional accomplishments, or by our enjoyment of music, athletics, or other activities that seem important to us.

Adler believed that psychological disorders begin in early childhood. He argued that children who are either overly nurtured or overly neglected by their parents are later likely to develop an *inferiority complex*—a psychological state in which people feel that they are not living up to expectations, leading them to have low self-esteem, with a tendency to try to overcompensate for the negative feelings. People with an inferiority complex often attempt to demonstrate their superiority to others at all costs, even if it means humiliating, dominating, or alienating them. According to Adler, most psychological disorders result from misguided attempts to compensate for the inferiority complex in order to meet the goal of superiority.

Carl Jung (1875–1961) was another student of Freud who developed his own theories about personality. Jung agreed with Freud about the power of the unconscious but felt that Freud overemphasized the importance of sexuality. Jung argued that in addition to the personal unconscious, there was also a **collective unconscious**, or *a collection of shared ancestral memories*. Jung believed that the collective unconscious contains a variety of *archetypes*, or cross-culturally universal symbols, which explain the similarities among people in their emotional reactions to many stimuli. Important archetypes include the mother, the goddess, the hero, and the mandala or circle, which Jung believed symbolized a desire for wholeness or unity. For Jung, the underlying motivation that guides successful personality is *self-realization*, or learning about and developing the self to the fullest possible extent.

Karen Horney (the last syllable of her last name rhymes with “eye”; 1855–1952), was a German physician who applied Freudian theories to create a personality theory that she thought was more balanced between men and women. Horney believed that parts of Freudian theory, and particularly the ideas of the Oedipus complex and penis envy, were biased against women. Horney argued that women's sense of inferiority was not due to their lack of a penis but rather to their dependency on men, an approach that the culture made it difficult for

them to break from. For Horney, the underlying motivation that guides personality development is the desire for *security*, the ability to develop appropriate and supportive relationships with others.

Another important neo-Freudian was Erich Fromm (1900–1980). Fromm’s focus was on the negative impact of technology, arguing that the increases in its use have led people to feel increasingly isolated from others. Fromm believed that the independence that technology brings us also creates the need to “escape from freedom,” that is, to become closer to others.

RESEARCH FOCUS: HOW THE FEAR OF DEATH CAUSES AGGRESSIVE BEHAVIOR

Fromm believed that the primary human motivation was to escape the fear of death, and contemporary research has shown how our concerns about dying can influence our behavior. In this research, people have been made to confront their death by writing about it or otherwise being reminded of it, and effects on their behavior are then observed. In one relevant study, McGregor et al. (1998) demonstrated that people who are provoked may be particularly aggressive after they have been reminded of the possibility of their own death. The participants in the study had been selected, on the basis of prior reporting, to have either politically liberal or politically conservative views. When they arrived at the lab they were asked to write a short paragraph describing their opinion of politics in the United States. In addition, half of the participants (the *mortality salient condition*) were asked to “briefly describe the emotions that the thought of your own death arouses in you” and to “jot down as specifically as you can, what you think will happen to you as you physically die, and once you are physically dead.” Participants in the *exam control condition* also thought about a negative event, but not one associated with a fear of death. They were instructed to “please briefly describe the emotions that the thought of your next important exam arouses in you” and to “jot down as specifically as you can, what you think will happen to you as you physically take your next exam, and once you are physically taking your next exam.”

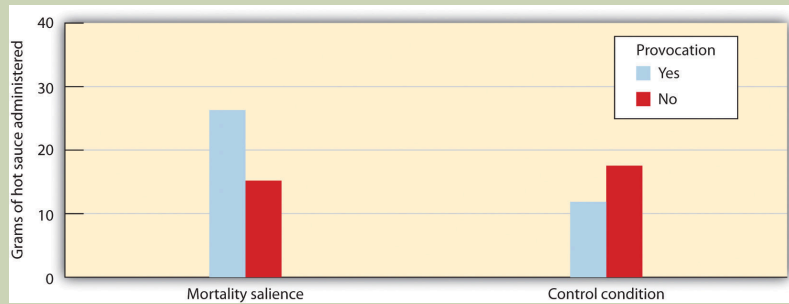
Then the participants read the essay that had supposedly just been written by another person. (The other person did not exist, but the participants didn’t know this until the end of the experiment.) The essay that they read had been prepared by the experimenters to be very negative toward politically liberal views or to be very negative toward politically conservative views. Thus one-half of the participants were provoked by the other person by reading a statement that strongly conflicted with their own political beliefs, whereas the other half read an essay in which the other person’s views supported their own (liberal or conservative) beliefs.

At this point the participants moved on to what they thought was a completely separate study in which they were to be tasting and giving their impression of some foods. Furthermore, they were told that it was necessary for the participants in the research to administer the food samples to

each other. At this point, the participants found out that the food they were going to be sampling was spicy hot sauce and that they were going to be administering the sauce to the very person whose essay they had just read. In addition, the participants read some information about the other person that indicated that he very much disliked eating spicy food. Participants were given a taste of the hot sauce (it was really hot!) and then instructed to place a quantity of it into a cup for the other person to sample. Furthermore, they were told that the other person would have to eat all the sauce.

As you can see in the figure below, *Aggression as a Function of Mortality Salience and Provocation*, McGregor et al. found that the participants who had not been reminded of their own death, even if they had been insulted by the partner, did not retaliate by giving him a lot of hot sauce to eat. On the other hand, the participants who were both provoked by the other person and who had also been reminded of their own death administered significantly more hot sauce than did the participants in the other three conditions. McGregor et al. (1998) argued that thinking about one's own death creates a strong concern with maintaining one's cherished worldviews (in this case, our political beliefs). When we are concerned about dying, we become more motivated to defend these important beliefs from the challenges made by others, in this case by aggressing through the hot sauce.

Aggression as a Function of Mortality Salience and Provocation



Participants who had been provoked by a stranger who disagreed with them on important opinions, and who had also been reminded of their own death, administered significantly more unpleasant hot sauce to the partner than did the participants in the other three conditions. Adapted from McGregor, H. A., Lieberman, J. D., Greenberg, J., Solomon, S., Arndt, J., Simon, L., & Pyszczynski, T. (1998). Terror management and aggression: Evidence that mortality salience motivates aggression against worldview-threatening others. *Journal of Personality and Social Psychology*, 74(3), 590-605.

STRENGTHS AND LIMITATIONS OF FREUDIAN AND NEO-FREUDIAN APPROACHES

Freud has probably exerted a greater impact on the public's understanding of personality than any other thinker, and he has also in large part defined the field of psychology. Although Freudian psychologists no

longer talk about oral, anal, or genital “fixations,” they do continue to believe that our childhood experiences and unconscious motivations shape our personalities and our attachments with others, and they still make use of psychodynamic concepts when they conduct psychological therapy.

Nevertheless, Freud’s theories, as well as those of the neo-Freudians, have in many cases failed to pass the test of empiricism, and as a result they are less influential now than they have been in the past (Crews, 1998). The problems are first, that it has proved to be difficult to rigorously test Freudian theory because the predictions that it makes (particularly those regarding defense mechanisms) are often vague and unfalsifiable, and second, that the aspects of the theory that can be tested often have not received much empirical support.

As examples, although Freud claimed that children exposed to overly harsh toilet training would become fixated in the anal stage and thus be prone to excessive neatness, stinginess, and stubbornness in adulthood, research has found few reliable associations between toilet training practices and adult personality (Fisher & Greenberg, 1996). And since the time of Freud, the need to repress sexual desires would seem to have become much less necessary as societies have tolerated a wider variety of sexual practices. And yet the psychological disorders that Freud thought we caused by this repression have not decreased.

There is also little scientific support for most of the Freudian defense mechanisms. For example, studies have failed to yield evidence for the existence of repression. People who are exposed to traumatic experiences in war have been found to remember their traumas only too well (Kihlstrom, 1997). Although we may attempt to push information that is anxiety-arousing into our unconscious, this often has the ironic effect of making us think about the information even more strongly than if we hadn’t tried to repress it (Newman, Duff, & Baumeister, 1997). It is true that children remember little of their childhood experiences, but this seems to be true of both negative as well as positive experiences, is true for animals as well, and probably is better explained in terms of the brain’s inability to form long-term memories than in terms of repression. On the other hand, Freud’s important idea that expressing or talking through one’s difficulties can be psychologically helpful has been supported in current research (Baddeley & Pennebaker, 2009) and has become a mainstay of psychological therapy.

A particular problem for testing Freudian theories is that almost anything that conflicts with a prediction based in Freudian theory can be explained away in terms of the use of a defense mechanism. A man who expresses a lot of anger toward his father may be seen via Freudian theory to be experiencing the Oedipus complex, which includes conflict with the father. But a man who expresses no anger at all toward the father also may be seen as experiencing the Oedipus complex by repressing the anger. Because Freud hypothesized that either was possible, but did not specify when repression would or would not occur, the theory is difficult to falsify.

In terms of the important role of the unconscious, Freud seems to have been at least in part correct. More and more research demonstrates that a large part of everyday behavior is driven by processes that are outside our conscious awareness (Kihlstrom, 1987). And yet, although our unconscious motivations influence every aspect of our learning and behavior, Freud probably overestimated the extent to which these unconscious motivations are primarily sexual and aggressive.

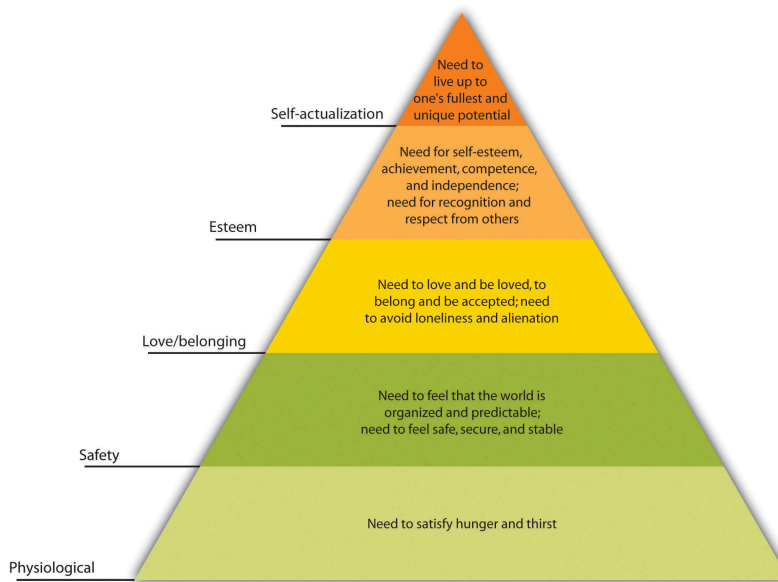
Taken together, it is fair to say that Freudian theory, like most psychological theories, was not entirely correct and that it has had to be modified over time as the results of new studies have become available. But the fundamental ideas about personality that Freud proposed, as well as the use of talk therapy as an essential component of therapy, are nevertheless still a major part of psychology and are used by clinical psychologists every day.

FOCUSING ON THE SELF: HUMANISM AND SELF-ACTUALIZATION

Psychoanalytic models of personality were complemented during the 1950s and 1960s by the theories of **humanistic psychologists**. In contrast to the proponents of psychoanalysis, humanists embraced the notion of free will. Arguing that people are free to choose their own lives and make their own decisions, humanistic psychologists focused on the underlying motivations that they believed drove personality, focusing on the nature of the **self-concept**, *the set of beliefs about who we are*, and **self-esteem**, *our positive feelings about the self*.

One of the most important humanists, Abraham Maslow (1908–1970), conceptualized personality in terms of a pyramid-shaped *hierarchy of motives*. At the base of the pyramid are the lowest-level motivations, including hunger and thirst, and safety and belongingness. Maslow argued that only when people are able to meet the lower-level needs are they able to move on to achieve the higher-level needs of self-esteem, and eventually **self-actualization**, which is *the motivation to develop our innate potential to the fullest possible extent*.

Maslow's Hierarchy of Needs



Abraham Maslow conceptualized personality in terms of a hierarchy of needs. The highest of these motivations is self-actualization.

Maslow studied how successful people, including Albert Einstein, Abraham Lincoln, Martin Luther King, Jr., Helen Keller, and Mahatma Gandhi had been able to lead such successful and productive lives. Maslow (1970) believed that self-actualized people are creative, spontaneous, and loving of themselves and others. They tend to have a few deep friendships rather than many superficial ones and are generally private. He felt that these individuals do not need to conform to the opinions of others because they are very confident and thus free to express unpopular opinions. Self-actualized people are also likely to have *peak experiences*, or transcendent moments of tranquility accompanied by a strong sense of connection with others.

Perhaps the best-known humanistic theorist is Carl Rogers (1902–1987). Rogers was positive about human nature, viewing people as primarily moral and helpful to others, and believed that we can achieve our full potential for emotional fulfillment if the self-concept is characterized by **unconditional positive regard**—*a set of behaviors including being genuine, open to experience, transparent, able to listen to others, and self-disclosing and empathic*. When we treat ourselves or others with unconditional positive regard, we express understanding and support, even while we may acknowledge failings. Unconditional positive regard allows us to admit our fears and failures, to drop our pretenses, and yet at the same time to feel completely accepted for what we are. The principle of unconditional positive regard has become a foundation of psychological therapy; therapists who use it in their practice are more effective than those who do not (Prochaska & Norcross, 2007; Yalom, 1995).

Although there are critiques of the humanistic psychologists (e.g., that Maslow focused on historically productive rather than destructive personalities in his research and thus drew overly optimistic conclusions about the capacity of people to do good), the ideas of humanism are so powerful and optimistic that they have continued to influence both everyday experiences as well as psychology. Today the *positive psychology movement* argues for many of these ideas, and research has documented the extent to which thinking positively and

openly has important positive consequences for our relationships, our life satisfaction, and our psychological and physical health (Seligman & Csikszentmihalyi, 2000).

RESEARCH FOCUS: SELF-DISCREPANCIES, ANXIETY, AND DEPRESSION

Tory Higgins and his colleagues (Higgins, Bond, Klein, & Strauman, 1986; Strauman & Higgins, 1988) have studied how different aspects of the self-concept relate to personality characteristics. These researchers focused on the types of emotional distress that we might experience as a result of how we are currently evaluating our self-concept. Higgins proposes that the emotions we experience are determined both by our perceptions of how well our own behaviors meet up to the standards and goals we have provided ourselves (our *internal standards*) and by our perceptions of how others think about us (our *external standards*). Furthermore, Higgins argues that different types of *self-discrepancies* lead to different types of negative emotions.

In one of Higgins's experiments (Higgins, Bond, Klein, & Strauman, 1986), participants were first asked to describe themselves using a self-report measure. The participants listed 10 thoughts that they thought described the kind of person they actually are; this is the *actual self-concept*. Then, participants also listed 10 thoughts that they thought described the type of person they would "ideally like to be" (the *ideal self-concept*) as well as 10 thoughts describing the way that someone else—for instance, a parent—thinks they "ought to be" (the *ought self-concept*).

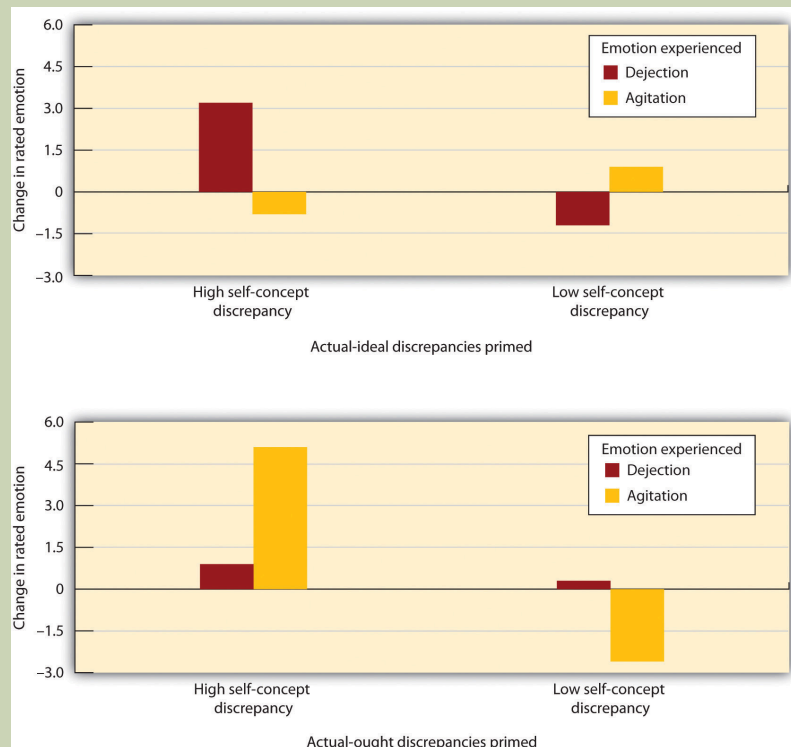
Higgins then divided his participants into two groups. Those with *low self-concept discrepancies* were those who listed similar traits on all three lists. Their ideal, ought, and actual self-concepts were all pretty similar and so they were not considered to be vulnerable to threats to their self-concept. The other half of the participants, those with *high self-concept discrepancies*, were those for whom the traits listed on the ideal and ought lists were very different from those listed on the actual self list. These participants were expected to be vulnerable to threats to the self-concept.

Then, at a later research session, Higgins first asked people to express their current emotions, including those related to sadness and anxiety. After obtaining this baseline measure Higgins activated either ideal or ought discrepancies for the participants. Participants in the *ideal self-discrepancy priming* condition were asked to think about and discuss their own and their parents' hopes and goals for them. Participants in the *ought self-priming condition* listed their own and their parents' beliefs concerning their duty and obligations. Then all participants again indicated their current emotions.

As you can see in the figure, Results from Higgins, Bond, Klein, and Strauman, for low self-concept discrepancy participants, thinking about their ideal or ought selves did not much change their emotions. For high self-concept discrepancy participants, however, priming the ideal self-concept

increased their sadness and dejection, whereas priming the ought self-concept increased their anxiety and agitation. These results are consistent with the idea that discrepancies between the ideal and the actual self lead us to experience sadness, dissatisfaction, and other depression-related emotions, whereas discrepancies between the actual and ought self are more likely to lead to fear, worry, tension, and other anxiety-related emotions.

Results From Higgins, Bond, Klein, and Strauman



Higgins and his colleagues documented the impact of self-concept discrepancies on emotion. For participants with low self-concept discrepancies (right bars), seeing words that related to the self had little influence on emotions. For those with high self-concept discrepancies (left bars), priming the ideal self increased dejection whereas priming the ought self increased agitation. Adapted from Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology*, 51(1), 5–15.

One of the critical aspects of Higgins's approach is that, as is our personality, our feelings are also influenced both by our own behavior and by our expectations of how other people view us. This makes it clear that even though you might not care that much about achieving in school, your failure to do well may still produce negative emotions because you realize that your parents do think it is important.

KEY TAKEAWAYS

- One of the most important psychological approaches to understanding personality is based on the psychodynamic approach to personality developed by Sigmund Freud.
- For Freud the mind was like an iceberg, with the many motivations of the unconscious being much larger, but also out of sight, in comparison to the consciousness of which we are aware.
- Freud proposed that the mind is divided into three components: id, ego, and superego, and that the interactions and conflicts among the components create personality.
- Freud proposed that we use defense mechanisms to cope with anxiety and to maintain a positive self-image.
- Freud argued that personality is developed through a series of psychosexual stages, each focusing on pleasure from a different part of the body.
- The neo-Freudian theorists, including Adler, Jung, Horney, and Fromm, emphasized the role of the unconscious and early experience in shaping personality, but placed less evidence on sexuality as the primary motivating force in personality.
- Psychoanalytic and behavioral models of personality were complemented during the 1950s and 1960s by the theories of humanistic psychologists, including Maslow and Rogers.

Exercises and Critical Thinking

1. Based on your understanding of psychodynamic theories, how would you analyze your own personality? Are there aspects of the theory that might help you explain your own strengths and weaknesses?
2. Based on your understanding of humanistic theories, how would you try to change your behavior to better meet the underlying motivations of security, acceptance, and self-realization?
3. Consider your own self-concept discrepancies. Do you have an actual-ideal or actual-

ought discrepancy? Which one is more important for you, and why?

55.

PERSONALITY AND BEHAVIOR

Learning Objectives

By the end of this section, you will be able to:

- Describe the trait approach to understanding personality and the influences of personality on behaviors.
- Discuss how situations play a role in one's personality.

Personality as Traits

One approach to examine the influence of personality on behaviors is the trait approach. Personalities are characterized in terms of **traits**, which are *relatively enduring characteristics that influence our behavior across many situations*. Personality traits such as introversion, friendliness, conscientiousness, honesty, and helpfulness are important because they help explain consistencies in behavior.

The most popular way of measuring traits is by administering personality tests on which people self-report about their own characteristics. Psychologists have investigated hundreds of traits using the self-report approach, and this research has found many personality traits that have important implications for behavior. You can see some examples of the personality dimensions that have been studied by psychologists and their implications for behavior in the table, *Some Personality Traits That Predict Behavior*.

Some Personality Traits That Predict Behavior

Trait	Description	Examples of behaviors exhibited by people who have the trait
Authoritarianism (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950)	A cluster of traits including conventionalism, superstition, toughness, and exaggerated concerns with sexuality	Authoritarians are more likely to be prejudiced, to conform to leaders, and to display rigid behaviors.
Individualism-collectivism (Triandis, 1989)	Individualism is the tendency to focus on oneself and one's personal goals; collectivism is the tendency to focus on one's relations with others.	Individualists prefer to engage in behaviors that make them stand out from others, whereas collectivists prefer to engage in behaviors that emphasize their similarity to others.
Internal versus external locus of control (Rotter, 1966)	In comparison to those with an external locus of control, people with an internal locus of control are more likely to believe that life events are due largely to their own efforts and personal characteristics.	People with higher internal locus of control are happier, less depressed, and healthier in comparison to those with an external locus of control.
Need for achievement (McClelland, 1958)	The desire to make significant accomplishments by mastering skills or meeting high standards	Those high in need for achievement select tasks that are not too difficult to be sure they will succeed in them.
Need for cognition (Cacioppo & Petty, 1982)	The extent to which people engage in and enjoy effortful cognitive activities	People high in the need for cognition pay more attention to arguments in ads.
Regulatory focus (Shah, Higgins, & Friedman, 1998)	Refers to differences in the motivations that energize behavior, varying from a <i>promotion orientation</i> (seeking out new opportunities) to a <i>prevention orientation</i> (avoiding negative outcomes)	People with a promotion orientation are more motivated by goals of gaining money, whereas those with prevention orientation are more concerned about losing money.
Self-consciousness (Fenigstein, Sheier, & Buss, 1975)	The tendency to introspect and examine one's inner self and feelings	People high in self-consciousness spend more time preparing their hair and makeup before they leave the house.
Self-esteem (Rosenberg, 1965)	High self-esteem means having a positive attitude toward oneself and one's capabilities.	High self-esteem is associated with a variety of positive psychological and health outcomes.
Sensation seeking (Zuckerman, 2007)	The motivation to engage in extreme and risky behaviors	Sensation seekers are more likely to engage in risky behaviors such as extreme and risky sports, substance abuse, unsafe sex, and crime.

Sources: Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). The authoritarian personality. New York, NY: Harper; Triandis, H. (1989). The self and social behavior in differing cultural contexts. *Psychological Review*, 93, 506–520; Rotter, J. (1966). Generalized expectancies of internal versus external locus of control of reinforcement. *Psychological Monographs*, 80; McClelland, D. C. (1958). Methods of measuring human motivation. In John W. Atkinson (Ed.), *Motives in fantasy, action and society*. Princeton,

NJ: D. Van Nostrand; Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, 42, 116–131; Shah, J., Higgins, T., & Friedman, R. S. (1998). Performance incentives and means: How regulatory focus influences goal attainment. *Journal of Personality and Social Psychology*, 74(2), 285–293; Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, 43, 522–527; Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press; Zuckerman, M. (2007). *Sensation seeking and risky behavior*. Washington, DC: American Psychological Association.

As with intelligence tests, the utility of self-report measures of personality depends on their *reliability* and *construct validity*. Some popular measures of personality are not useful because they are unreliable or invalid. Perhaps you have heard of a personality test known as the Myers-Briggs Type Indicator (MBTI). If so, you are not alone, because the MBTI is the most widely administered personality test in the world, given millions of times a year to employees in thousands of companies. The MBTI categorizes people into one of four categories on each of four dimensions: *introversion* versus *extroversion*, *sensing* versus *intuiting*, *thinking* versus *feeling*, and *judging* versus *perceiving*.

Although completing the MBTI can be useful for helping people think about individual differences in personality, and for “breaking the ice” at meetings, the measure itself is not psychologically useful because it is not reliable or valid. People’s classifications change over time and scores on the MBTI do not relate to other measures of personality or to behavior (Hunsley, Lee, & Wood, 2003). Measures such as the MBTI remind us that it is important to scientifically and empirically test the effectiveness of personality tests by assessing their stability over time and their ability to predict behavior.

One of the challenges of the trait approach to personality is that there are so many of them; there are at least 18,000 English words that can be used to describe people (Allport & Odbert, 1936). Thus a major goal of psychologists is to take this vast number of descriptors (many of which are very similar to each other) and to determine the underlying important or “core” traits among them (John, Angleitner, & Ostendorf, 1988).

The trait approach to personality was pioneered by early psychologists, including Gordon Allport (1897–1967), Raymond Cattell (1905–1998), and Hans Eysenck (1916–1997). Each of these psychologists believed in the idea of the trait as the stable unit of personality, and each attempted to provide a list or taxonomy of the most important trait dimensions. Their approach was to provide people with a self-report measure and then to use statistical analyses to look for the underlying “factors” or “clusters” of traits, according to the frequency and the co-occurrence of traits in the respondents.

Allport (1937) began his work by reducing the 18,000 traits to a set of about 4,500 traitlike words that he organized into three levels according to their importance. He called them “cardinal traits” (the most important traits), “central traits” (the basic and most useful traits), and “secondary traits” (the less obvious and less consistent ones). Cattell (1990) used a statistical procedure known as *factor analysis* to analyze the correlations among traits and to identify the most important ones. On the basis of his research he identified what he referred to as “source” (more important) and “surface” (less important) traits, and he developed a measure that assessed 16 dimensions of traits based on personality adjectives taken from everyday language.

Hans Eysenck was particularly interested in the biological and genetic origins of personality and made an

important contribution to understanding the nature of a fundamental personality trait: *extraversion* versus *introversion* (Eysenck, 1998). Eysenck proposed that people who are extroverted (i.e., who enjoy socializing with others) have lower levels of naturally occurring arousal than do introverts (who are less likely to enjoy being with others). Eysenck argued that extroverts have a greater desire to socialize with others to increase their arousal level, which is naturally too low, whereas introverts, who have naturally high arousal, do not desire to engage in social activities because they are overly stimulating.

The fundamental work on trait dimensions conducted by Allport, Cattell, Eysenck, and many others has led to contemporary trait models, the most important and well-validated of which is the **Five-Factor (Big Five) Model of Personality**. According to this model, *there are five fundamental underlying trait dimensions that are stable across time, cross-culturally shared, and explain a substantial proportion of behavior* (Costa & McCrae, 1992; Goldberg, 1982). As you can see in the table, The Five Factors of the Five-Factor Model of Personality, the five dimensions (sometimes known as the “Big Five”) are *agreeableness, conscientiousness, extraversion, neuroticism, and openness to experience*. (You can remember them using the watery acronyms CANOE or OCEAN.)

The Five Factors of the Five-Factor Model of Personality

Dimension	Sample items	Description	Examples of behaviors predicted by the trait
Openness to experience	"I have a vivid imagination"; "I have a rich vocabulary"; "I have excellent ideas."	A general appreciation for art, emotion, adventure, unusual ideas, imagination, curiosity, and variety of experience	Individuals who are highly open to experience tend to have distinctive and unconventional decorations in their home. They are also likely to have books on a wide variety of topics, a diverse music collection, and works of art on display.
Conscientiousness	"I am always prepared"; "I am exacting in my work"; "I follow a schedule."	A tendency to show self-discipline, act dutifully, and aim for achievement	Individuals who are conscientious have a preference for planned rather than spontaneous behavior.
Extraversion	"I am the life of the party"; "I feel comfortable around people"; "I talk to a lot of different people at parties."	The tendency to experience positive emotions and to seek out stimulation and the company of others	Extroverts enjoy being with people. In groups they like to talk, assert themselves, and draw attention to themselves.
Agreeableness	"I am interested in people"; "I feel others' emotions"; "I make people feel at ease."	A tendency to be compassionate and cooperative rather than suspicious and antagonistic toward others; reflects individual differences in general concern for social harmony	Agreeable individuals value getting along with others. They are generally considerate, friendly, generous, helpful, and willing to compromise their interests with those of others.
Neuroticism	"I am not usually relaxed"; "I get upset easily"; "I am easily disturbed"	The tendency to experience negative emotions, such as anger, anxiety, or depression; sometimes called "emotional instability"	Those who score high in neuroticism are more likely to interpret ordinary situations as threatening and minor frustrations as hopelessly difficult. They may have trouble thinking clearly, making decisions, and coping effectively with stress.

A large body of research evidence has supported the five-factor model. The Big Five dimensions seem to be cross-cultural, because the same five factors have been identified in participants in China, Japan, Italy, Hungary, Turkey, and many other countries (Triandis & Suh, 2002). The Big Five dimensions also accurately predict behavior. For instance, a pattern of high conscientiousness, low neuroticism, and high agreeableness predicts successful job performance (Tett, Jackson, & Rothstein, 1991). Scores on the Big Five dimensions also predict the performance of U.S. presidents; ratings of openness to experience are correlated positively with ratings of presidential success, whereas ratings of agreeableness are correlated negatively with success (Rubenzer, Faschingbauer, & Ones, 2000). The Big Five factors are also increasingly being used in helping

researchers understand the dimensions of psychological disorders such as anxiety and depression (Oldham, 2010; Saulsman & Page, 2004).

An advantage of the five-factor approach is that it is parsimonious. Rather than studying hundreds of traits, researchers can focus on only five underlying dimensions. The Big Five may also capture other dimensions that have been of interest to psychologists. For instance, the trait dimension of *need for achievement* relates to the Big Five variable of conscientiousness, and *self-esteem* relates to low neuroticism. On the other hand, the Big Five factors do not seem to capture all the important dimensions of personality. For instance, the Big Five does not capture moral behavior, although this variable is important in many theories of personality. And there is evidence that the Big Five factors are not exactly the same across all cultures (Cheung & Leung, 1998).

SITUATIONAL INFLUENCES ON PERSONALITY

One challenge to the trait approach to personality is that traits may not be as stable as we think they are. When we say that Malik is friendly, we mean that Malik is friendly today and will be friendly tomorrow and even next week. And we mean that Malik is friendlier than average in all situations. But what if Malik were found to behave in a friendly way with his family members but to be unfriendly with his fellow classmates? This would clash with the idea that traits are stable across time and situation.

The psychologist Walter Mischel (1968) reviewed the existing literature on traits and found that there was only a relatively low correlation (about $r = .30$) between the traits that a person expressed in one situation and those that they expressed in other situations. In one relevant study, Hartshorne, May, Maller, & Shuttlesworth (1928) examined the correlations among various behavioral indicators of honesty in children. They also enticed children to behave either honestly or dishonestly in different situations, for instance, by making it easy or difficult for them to steal and cheat. The correlations among children's behavior was low, generally less than $r = .30$, showing that children who steal in one situation are not always the same children who steal in a different situation. And similar low correlations were found in adults on other measures, including dependency, friendliness, and conscientiousness (Bem & Allen, 1974).

Psychologists have proposed two possibilities for these low correlations. One possibility is that the natural tendency for people to see traits in others leads us to believe that people have stable personalities when they really do not. In short, perhaps traits are more in the heads of the people who are doing the judging than they are in the behaviors of the people being observed. The fact that people tend to use human personality traits, such as the Big Five, to judge animals in the same way that they use these traits to judge humans is consistent

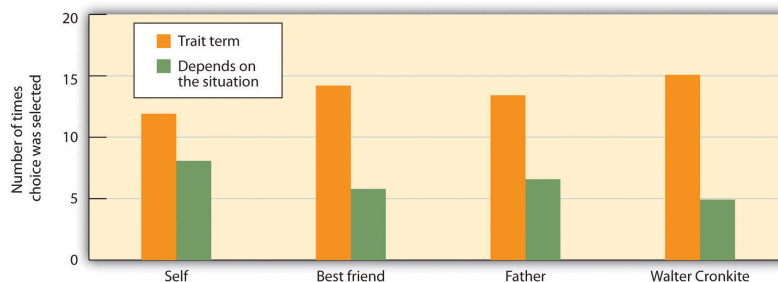
with this idea (Gosling, 2001). And this idea also fits with research showing that people use their knowledge representation (schemas) about people to help them interpret the world around them and that these schemas color their judgments of others' personalities (Fiske & Taylor, 2007).

Research has also shown that people tend to see more traits in other people than they do in themselves. You might be able to get a feeling for this by taking the following short quiz. First, think about a person you know—your mom, your roommate, or a classmate—and choose which of the three responses on each of the four lines best describes him or her. Then answer the questions again, but this time about yourself.

1.	Energetic	Relaxed	Depends on the situation
2.	Skeptical	Trusting	Depends on the situation
3.	Quiet	Talkative	Depends on the situation
4.	Intense	Calm	Depends on the situation

Richard Nisbett and his colleagues (Nisbett, Caputo, Legant, & Marecek, 1973) had college students complete this same task for themselves, for their best friend, for their father, and for the (at the time well-known) newscaster Walter Cronkite. As you can see in the figure, *We Tend to Overestimate the Traits of Others*, the participants chose one of the two trait terms more often for other people than they did for themselves, and chose “depends on the situation” more frequently for themselves than they did for the other people. These results also suggest that people may perceive more consistent traits in others than they should.

We Tend to Overestimate the Traits of Others



Adapted from Nisbett, R. E., Caputo, C., Legant, P., & Marecek, J. (1973). Behavior as seen by the actor and as seen by the observer. *Journal of Personality and Social Psychology*, 27(2), 154-164.

The human tendency to perceive traits is so strong that it is very easy to convince people that trait descriptions of themselves are accurate. Imagine that you had completed a personality test and the psychologist administering the measure gave you this description of your personality:

You have a great need for other people to like and admire you. You have a tendency to be critical of yourself. You have a great deal of unused capacity, which you have not turned to your advantage. While you have some

personality weaknesses, you are generally able to compensate for them. Disciplined and self-controlled outside, you tend to be worrisome and insecure inside. At times you have serious doubts as to whether you have made the right decision or done the right thing.

I would imagine that you might find that it described you. You probably do criticize yourself at least sometimes, and you probably do sometimes worry about things. The problem is that you would most likely have found some truth in a personality description that was the opposite. Could this description fit you too?

You frequently stand up for your own opinions even if it means that others may judge you negatively. You have a tendency to find the positives in your own behavior. You work to the fullest extent of your capabilities. You have few personality weaknesses, but some may show up under stress. You sometimes confide in others that you are concerned or worried, but inside you maintain discipline and self-control. You generally believe that you have made the right decision and done the right thing.

The **Barnum effect** refers to *the observation that people tend to believe in descriptions of their personality that supposedly are descriptive of them but could in fact describe almost anyone*. The Barnum effect helps us understand why many people believe in astrology, horoscopes, fortune-telling, palm reading, tarot card reading, and even some personality tests. People are likely to accept descriptions of their personality if they think that they have been written for them, even though they cannot distinguish their own tarot card or horoscope readings from those of others at better than chance levels (Hines, 2003). Again, people seem to believe in traits more than they should.



The popularity of tarot card reading, crystal ball reading, horoscopes, palm reading, and other techniques shows the human propensity to believe in traits. Credit: Conny Sandland – Fortune teller in Little India, Klang, Malaysia – CC BY-NC 2.0; that's – Tarot cards on a Thai fortune teller's table – CC BY-NC 2.0.

A second way that psychologists responded to Mischel's findings was by searching even more carefully for the existence of traits. One insight was that the relationship between a trait and a behavior is less than perfect because people can express their traits in different ways (Mischel & Shoda, 2008). People high in extraversion, for instance, may become teachers, salesmen, actors, or even criminals. Although the behaviors are very different, they nevertheless all fit with the meaning of the underlying trait.

Psychologists also found that, because people do behave differently in different situations, personality will only predict behavior when the behaviors are aggregated or averaged across different situations. We might not be able to use the personality trait of openness to experience to determine what Saul will do on Friday night, but we can use it to predict what he will do over the next year in a variety of situations. When many measurements of behavior are combined, there is much clearer evidence for the stability of traits and for the effects of traits on behavior (Roberts & DelVecchio, 2000; Srivastava, John, Gosling, & Potter, 2003).

Taken together, these findings make a very important point about personality, which is that it not only comes from inside us but is also shaped by the situations that we are exposed to. Personality is derived

from our interactions with and observations of others, from our interpretations of those interactions and observations, and from our choices of which social situations we prefer to enter or avoid (Bandura, 1986). In fact, behaviorists such as B. F. Skinner explain personality entirely in terms of the environmental influences that the person has experienced. Because we are profoundly influenced by the situations that we are exposed to, our behavior does change from situation to situation, making personality less stable than we might expect. And yet personality does matter—we can, in many cases, use personality measures to predict behavior across situations.

56.

APPROACHES AND MEASUREMENTS

Learning Objectives

By the end of this section you should be able to:

- Describe what MMPI is and how people use MMPI to measure personalities.
- Describe various projective tests.
- Discuss how personality may differ across cultures.
- Discuss ways to study personalities across cultures.

The MMPI and Projective Tests

One of the most important measures of personality (which is used primarily to assess deviations from a “normal” or “average” personality) is the **Minnesota Multiphasic Personality Inventory (MMPI)**, *a test used around the world to identify personality and psychological disorders* (Tellegen et al., 2003). The MMPI was developed by creating a list of more than 1,000 true-false questions and choosing those that best differentiated patients with different psychological disorders from other people. The current version (the MMPI-2) has more than 500 questions, and the items can be combined into a large number of different subscales. Some of the most important of these are shown in the table, Some of the Major Subscales of the MMPI, but there are also scales that represent family problems, work attitudes, and many other dimensions. The MMPI also has questions that are designed to detect the tendency of the respondents to lie, fake, or simply not answer the questions.

Some of the Major Subscales of the MMPI

Abbreviation	Description	What is measured	No. of items
Hs	Hypochondriasis	Concern with bodily symptoms	32
D	Depression	Depressive symptoms	57
Hy	Hysteria	Awareness of problems and vulnerabilities	60
Pd	Psychopathic deviate	Conflict, struggle, anger, respect for society's rules	50
MF	Masculinity/femininity	Stereotypical masculine or feminine interests/behaviors	56
Pa	Paranoia	Level of trust, suspiciousness, sensitivity	40
Pt	Psychasthenia	Worry, anxiety, tension, doubts, obsessiveness	48
Sc	Schizophrenia	Odd thinking and social alienation	78
Ma	Hypomania	Level of excitability	46
Si	Social introversion	People orientation	69

To interpret the results, the clinician looks at the pattern of responses across the different subscales and makes a diagnosis about the potential psychological problems facing the patient. Although clinicians prefer to interpret the patterns themselves, a variety of research has demonstrated that computers can often interpret the results as well as can clinicians (Garb, 1998; Karon, 2000). Extensive research has found that the MMPI-2 can accurately predict which of many different psychological disorders a person suffers from (Graham, 2006).

One potential problem with a measure like the MMPI is that it asks people to consciously report on their inner experiences. But much of our personality is determined by unconscious processes of which we are only vaguely or not at all aware. **Projective measures** are *measures of personality in which unstructured stimuli, such as inkblots, drawings of social situations, or incomplete sentences, are shown to participants, who are asked to freely list what comes to mind as they think about the stimuli*. Experts then score the responses for clues to personality. The proposed advantage of these tests is that they are more indirect—they allow the respondent to freely express whatever comes to mind, including perhaps the contents of their unconscious experiences.

One commonly used projective test is the *Rorschach Inkblot Test*, developed by the Swiss psychiatrist Hermann Rorschach (1884–1922). The **Rorschach Inkblot Test** is *a projective measure of personality in which the respondent indicates his or her thoughts about a series of 10 symmetrical inkblots*. The Rorschach is administered millions of times every year. The participants are asked to respond to the inkblots, and their responses are systematically scored in terms of what, where, and why they saw what they saw. For example, people who focus on the details of the inkblots may have obsessive-compulsive tendencies, whereas those who talk about sex or aggression may have sexual or aggressive problems.

Rorschach Inkblots



The Rorschach Inkblot Test is a projective test designed to assess psychological disorders.

Another frequently administered projective test is the *Thematic Apperception Test (TAT)*, developed by the psychologist Henry Murray (1893–1988). The **Thematic Apperception Test (TAT)** is a *projective measure of personality in which the respondent is asked to create stories about sketches of ambiguous situations, most of them of people, either alone or with others*. The sketches are shown to individuals, who are asked to tell a story about what is happening in the picture. The TAT assumes that people may be unwilling or unable to admit their true feelings when asked directly but that these feelings will show up in the stories about the pictures. Trained coders read the stories and use them to develop a personality profile of the respondent.

Other popular projective tests include those that ask the respondent to draw pictures, such as the Draw-A-Person test (Machover, 1949), and free association tests in which the respondent quickly responds with the first word that comes to mind when the examiner says a test word. Another approach is the use of “anatomically correct” dolls that feature representations of the male and female genitals. Investigators allow children to play with the dolls and then try to determine on the basis of the play if the children may have been sexually abused.

The advantage of projective tests is that they are less direct, allowing people to avoid using their defense

mechanisms and therefore show their “true” personality. The idea is that when people view ambiguous stimuli they will describe them according to the aspects of personality that are most important to them, and therefore bypass some of the limitations of more conscious responding.

Despite their widespread use, however, the empirical evidence supporting the use of projective tests is mixed (Karon, 2000; Wood, Nezworski, Lilienfeld, & Garb, 2003). The reliability of the measures is low because people often produce very different responses on different occasions. The construct validity of the measures is also suspect because there are very few consistent associations between Rorschach scores or TAT scores and most personality traits. The projective tests often fail to distinguish between people with psychological disorders and those without or to correlate with other measures of personality or with behavior.

In sum, projective tests are more useful as icebreakers to get to know a person better, to make the person feel comfortable, and to get some ideas about topics that may be of importance to that person than for accurately diagnosing personality.

Psychology in Everyday Life: Leaders and Leadership

One trait that has been studied in thousands of studies is **leadership**, *the ability to direct or inspire others to achieve goals*. *Trait theories of leadership* are theories based on the idea that some people are simply “natural leaders” because they possess personality characteristics that make them effective (Zaccaro, 2007). Consider Steve Jobs, the founder of Apple, shown in the figure “Varieties of Leaders.” What characteristics do you think he possessed that allowed him to create such a strong company, even though many similar companies failed?

Varieties of Leaders



Which personality traits do you think characterize these leaders?

Research has found that being intelligent is an important characteristic of leaders, as long as the leader communicates to others in a way that is easily understood by his or her followers (Simonton, 1994, 1995). Other research has found that people with good social skills, such as the ability to accurately perceive the needs and goals of the group members and to communicate with others, also tend to make good leaders (Kenny & Zaccaro, 1983).

Because so many characteristics seem to be related to leader skills, some researchers have attempted to account for leadership not in terms of individual traits, but rather in terms of a package of traits that successful leaders seem to have. Some have considered this in terms of charisma (Sternberg & Lubart, 1995; Sternberg, 2002). **Charismatic leaders** are *leaders who are enthusiastic, committed, and self-confident; who tend to talk about the importance of group goals at a broad level; and who make personal sacrifices for the group*. Charismatic leaders express views that support and validate existing group norms but that also contain a vision of what the group could or should be. Charismatic leaders use their referent power to motivate, uplift, and inspire others. And research has found a positive relationship between a leader's charisma and effective leadership performance (Simonton, 1988).

Another trait-based approach to leadership is based on the idea that leaders take either *transactional* or *transformational* leadership styles with their subordinates (Bass, 1999; Pieterse, Van Knippenberg, Schippers, & Stam, 2010). *Transactional* leaders are the more regular leaders, who work with their subordinates to help them understand what is required of them and to get the job done. *Transformational* leaders, on the other hand, are more like charismatic leaders—they have a vision of where the group is going, and attempt to stimulate and inspire their workers to move beyond their present status and to create a new and better future.

Despite the fact that there appear to be at least some personality traits that relate to leadership ability, the most important approaches to understanding leadership take into consideration both the personality characteristics of the leader as well as the situation in which the leader is operating. In some cases the situation itself is important. For instance, you might remember that President George W. Bush's ratings as a leader increased dramatically after the September 11, 2001, terrorist attacks on the World Trade Center. This is a classic example of how a situation can influence the perceptions of a leader's skill.

In still other cases, different types of leaders may perform differently in different situations. Leaders whose personalities lead them to be more focused on fostering harmonious social relationships among the members of the group, for instance, are particularly effective in situations in which the group is already functioning well and yet it is important to keep the group members engaged in the task and committed to the group outcomes. Leaders who are more task-oriented and directive, on the other hand, are more effective when the group is not functioning well and needs a firm hand to guide it (Ayman, Chemers, & Fiedler, 1995).

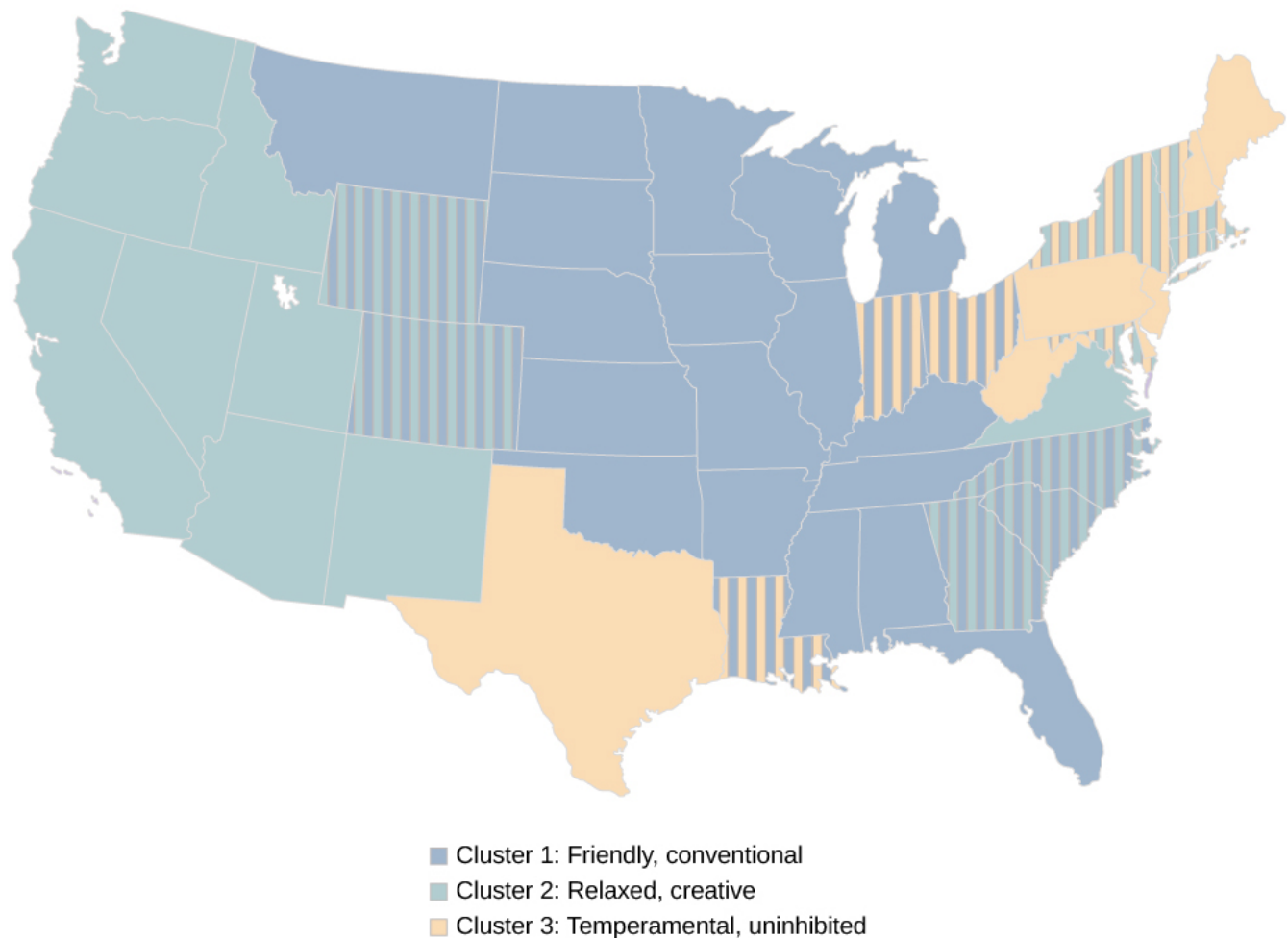
As you have learned in this chapter, personality is shaped by both genetic and environmental factors. The culture in which you live is one of the most important environmental factors that shapes your personality (Triandis & Suh, 2002). The term *culture* refers to all of the beliefs, customs, art, and traditions of a particular society. Culture is transmitted to people through language as well as through the modeling of culturally acceptable and nonacceptable behaviors that are either rewarded or punished (Triandis & Suh, 2002). With these ideas in mind, personality psychologists have become interested in the role of culture in understanding personality. They ask whether personality traits are the same across cultures or if there are variations. It appears that there are both universal and culture-specific aspects that account for variation in people's personalities.

Why might it be important to consider cultural influences on personality? Western ideas about personality may not be applicable to other cultures (Benet-Martinez & Oishi, 2008). In fact, there is evidence that the strength of personality traits varies across cultures. Let's take a look at some of the Big Five factors (conscientiousness, neuroticism, openness, and extroversion) across cultures. As you will learn when you study

social psychology, Asian cultures are more collectivist, and people in these cultures tend to be less extroverted. People in Central and South American cultures tend to score higher on openness to experience, whereas Europeans score higher on neuroticism (Benet-Martinez & Karakitapoglu-Aygun, 2003).

According to this study, there also seem to be regional personality differences within the United States. Researchers analyzed responses from over 1.5 million individuals in the United States and found that there are three distinct regional personality clusters: Cluster 1, which is in the Upper Midwest and Deep South, is dominated by people who fall into the “friendly and conventional” personality; Cluster 2, which includes the West, is dominated by people who are more relaxed, emotionally stable, calm, and creative; and Cluster 3, which includes the Northeast, has more people who are stressed, irritable, and depressed. People who live in Clusters 2 and 3 are also generally more open (Rentfrow et al., 2013).

Personality Clusters in the Continental United States



Researchers found three distinct regional personality clusters in the United States. People tend to be friendly and conventional in the Upper Midwest and Deep South; relaxed, emotionally stable, and creative in the West; and stressed, irritable, and depressed in the Northeast (Rentfrow et al., 2013).

One explanation for the regional differences is selective migration (Rentfrow et al., 2013). Selective migration is the concept that people choose to move to places that are compatible with their personalities and needs. For example, a person high on the agreeable scale would likely want to live near family and friends, and would choose to settle or remain in such an area. In contrast, someone high on openness would prefer to settle in a place that is recognized as diverse and innovative (such as California).

Personality in Individualist and Collectivist Cultures

Individualist cultures and collectivist cultures place emphasis on different basic values. People who live in individualist cultures tend to believe that independence, competition, and personal achievement are important. Individuals in Western nations such as the United States, England, and Australia score high on individualism (Oyserman, Coon, & Kemmelmier, 2002). People who live in collectivist cultures value social harmony, respectfulness, and group needs over individual needs. Individuals who live in countries in Asia, Africa, and South America score high on collectivism (Hofstede, 2001; Triandis, 1995). These values influence personality. For example, Yang (2006) found that people in individualist cultures displayed more personally oriented personality traits, whereas people in collectivist cultures displayed more socially oriented personality traits.

Approaches to Studying Personality in a Cultural Context

There are three approaches that can be used to study personality in a cultural context, the *cultural-comparative approach*; the *indigenous approach*; and the *combined approach*, which incorporates elements of both views. Since ideas about personality have a Western basis, the cultural-comparative approach seeks to test Western ideas about personality in other cultures to determine whether they can be generalized and if they have cultural validity (Cheung van de Vijver, & Leong, 2011). For example, recall from the previous section on the trait perspective that researchers used the cultural-comparative approach to test the universality of McCrae and Costa's Five Factor Model. They found applicability in numerous cultures around the world, with the Big Five traits being stable in many cultures (McCrae & Costa, 1997; McCrae et al., 2005). The indigenous approach came about in reaction to the dominance of Western approaches to the study of personality in non-Western settings (Cheung et al., 2011). Because Western-based personality assessments cannot fully capture the personality constructs of other cultures, the indigenous model has led to the development of personality assessment instruments that are based on constructs relevant to the culture being studied (Cheung et al., 2011). The third approach to cross-cultural studies of personality is the combined approach, which serves as a bridge

between Western and indigenous psychology as a way of understanding both universal and cultural variations in personality (Cheung et al., 2011).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=226#h5p-75>

Summary

The culture in which you live is one of the most important environmental factors that shapes your personality. Western ideas about personality may not be applicable to other cultures. In fact, there is evidence that the strength of personality traits varies across cultures. Individualist cultures and collectivist cultures place emphasis on different basic values. People who live in individualist cultures tend to believe that independence, competition, and personal achievement are important. People who live in collectivist cultures value social harmony, respectfulness, and group needs over individual needs. There are three approaches that can be used to study personality in a cultural context: the cultural-comparative approach, the indigenous approach, and the combined approach, which incorporates both elements of both views.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=226#h5p-76>

Critical Thinking Questions

Why might it be important to consider cultural influences on personality?
Since culture influences one's personality, then Western ideas about personality may not be applicable to people of other cultures. In addition, Western-based measures of personality assessment may not be valid when used to collect data on people from other cultures.

Personal Application Questions

According to the work of Rentfrow and colleagues, personalities are not randomly distributed. Instead they fit into distinct geographic clusters. Based on where you live, do you agree or disagree with the traits associated with yourself and the residents of your area of the country? Why or why not?

57.

REFERENCES

- Adler, A. (1930). Individual psychology. In C. Murchison (Ed.), *Psychologies of 1930* (pp. 395–405). Worcester, MA: Clark University Press.
- Adler, A. (1937). A school girl's exaggeration of her own importance. *International Journal of Individual Psychology*, 3(1), 3–12.
- Adler, A. (1956). *The individual psychology of Alfred Adler: A systematic presentation in selections from his writings*. (C. H. Ansbacher & R. Ansbacher, Eds.). New York: Harper.
- Adler, A. (1961). The practice and theory of individual psychology. In T. Shipley (Ed.), *Classics in psychology* (pp. 687–714). New York: Philosophical Library
- Adler, A. (1964). *Superiority and social interest*. New York: Norton.
- Akomolafe, M. J. (2013). Personality characteristics as predictors of academic performance of secondary school students. *Mediterranean Journal of Social Sciences*, 4(2), 657–664.
- Allport, G. W. & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. Albany, NY: Psychological Review Company.
- Aronow, E., Weiss, K. A., & Rezinkoff, M. (2001). *A practical guide to the Thematic Apperception Test*. Philadelphia: Brunner Routledge.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1995). *Self-efficacy in changing societies*. Cambridge, UK: Cambridge University Press.
- Benassi, V. A., Sweeney, P. D., & Dufour, C. L. (1988). Is there a relation between locus of control orientation and depression? *Journal of Abnormal Psychology*, 97(3), 357.
- Ben-Porath, Y., & Tellegen, A. (2008). *Minnesota Multiphasic Personality Inventory-2-RF*. Minneapolis, MN: University of Minnesota Press.
- Benet-Martínez, V. & Karakitapoglu-Aygun, Z. (2003). The interplay of cultural values and personality in predicting life-satisfaction: Comparing Asian- and European-Americans. *Journal of Cross-Cultural Psychology*, 34, 38–61.
- Benet-Martínez, V., & Oishi, S. (2008). Culture and personality. In O. P. John, R.W. Robins, L. A. Pervin (Eds.), *Handbook of personality: Theory and research*. New York: Guildford Press.

- Beutler, L. E., Nussbaum, P. D., & Meredith, K. E. (1988). Changing personality patterns of police officers. *Professional Psychology: Research and Practice*, 19(5), 503–507.
- Bouchard, T., Jr. (1994). Genes, environment, and personality. *Science*, 264, 1700–1701.
- Bouchard, T., Jr., Lykken, D. T., McGue, M., Segal, N. L., & Tellegen, A. (1990). Sources of human psychological differences: The Minnesota Study of Twins Reared Apart. *Science*, 250, 223–228.
- Burger, J. (2008). *Personality* (7th ed.). Belmont, CA: Thompson Higher Education.
- Carter, J. E., and Heath, B. H. (1990). *Somatotyping: Development and applications*. Cambridge, UK: Cambridge University Press.
- Carter, S., Champagne, F., Coates, S., Nercessian, E., Pfaff, D., Schecter, D., & Stern, N. B. (2008). *Development of temperament symposium*. Philoctetes Center, New York.
- Cattell, R. B. (1946). *The description and measurement of personality*. New York: Harcourt, Brace, & World.
- Cattell, R. B. (1957). *Personality and motivation structure and measurement*. New York: World Book.
- Chamorro-Premuzic, T., & Furnham, A. (2008). Personality, intelligence, and approaches to learning as predictors of academic performance. *Personality and Individual Differences*, 44, 1596–1603.
- Cheung, F. M., van de Vijver, F. J. R., & Leong, F. T. L. (2011). Toward a new approach to the study of personality in culture. *American Psychologist*, 66(7), 593–603.
- Clark, A. L., & Watson, D. (2008). Temperament: An organizing paradigm for trait psychology. In O. P. John, R. W. Robins, & L. A. Previn (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 265–286). New York: Guilford Press.
- Conrad, N. & Party, M.W. (2012). Conscientiousness and academic performance: A Mediational Analysis. *International Journal for the Scholarship of Teaching and Learning*, 6 (1), 1–14.
- Cortés, J., & Gatti, F. (1972). *Delinquency and crime: A biopsychological approach*. New York: Seminar Press.
- Costantino, G. (1982). TEMAS: A new technique for personality research assessment of Hispanic children. Hispanic Research Center, Fordham University *Research Bulletin*, 5, 3–7.
- Cramer, P. (2004). *Storytelling, narrative, and the Thematic Apperception Test*. New York: Guilford Press.
- Damon, S. (1955). Physique and success in military flying. *American Journal of Physical Anthropology*, 13(2), 217–252.
- Donnellan, M. B., & Lucas, R. E. (2008). Age differences in the big five across the life span: Evidence from two national samples. *Psychology and Aging*, 23(3), 558–566.
- Duzant, R. (2005). *Differences of emotional tone and story length of African American respondents when administered the Contemporized Themes Concerning Blacks test versus the Thematic Apperception Test*. Unpublished doctoral dissertation, The Chicago School of Professional Psychology, Chicago, IL.
- Exner, J. E. (2002). *The Rorschach: Basic foundations and principles of interpretation* (Vol. 1). Hoboken, NJ: Wiley.
- Eysenck, H. J. (1990). An improvement on personality inventory. *Current Contents: Social and Behavioral Sciences*, 22(18), 20.

- Eysenck, H. J. (1992). Four ways five factors are *not* basic. *Personality and Individual Differences*, 13, 667–673.
- Eysenck, H. J. (2009). *The biological basis of personality* (3rd ed.). New Brunswick, NJ: Transaction Publishers.
- Eysenck, H. J. (1970). *The structure of human personality*. London, UK: Methuen.
- Eysenck, S. B. G., & Eysenck, H. J. (1963). The validity of questionnaire and rating assessments of extroversion and neuroticism, and their factorial stability. *British Journal of Psychology*, 54, 51–62.
- Eysenck, H. J., & Eysenck, M. W. (1985). *Personality and individual differences: A natural science approach*. New York: Plenum Press.
- Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences*, 6(1), 21–29.
- Fazeli, S. H. (2012). The exploring nature of the assessment instrument of five factors of personality traits in the current studies of personality. *Asian Social Science*, 8(2), 264–275.
- Fancher, R. W. (1979). *Pioneers of psychology*. New York: Norton.
- Freud, S. (1920). Resistance and suppression. *A general introduction to psychoanalysis* (pp. 248–261). New York: Horace Liveright.
- Freud, S. (1923/1949). The ego and the id. London: Hogarth.
- Freud, S. (1931/1968). Female sexuality. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 21). London: Hogarth Press.
- Funder, D. C. (2001). Personality. *Annual Review of Psychology*, 52, 197–221.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.
- Holaday, D., Smith, D. A., & Sherry, Alissa. (2010). Sentence completion tests: A review of the literature and results of a survey of members of the society for personality assessment. *Journal of Personality Assessment*, 74(3), 371–383.
- Hothersall, D. (1995). *History of psychology*. New York: McGraw-Hill.
- Hoy, M. (1997). *Contemporizing of the Themes Concerning Blacks test (C-TCB)*. Alameda, CA: California School of Professional Psychology.
- Hoy-Watkins, M., & Jenkins-Moore, V. (2008). The Contemporized-Themes Concerning Blacks Test (C-TCB). In S. R. Jenkins (Ed.), *A Handbook of Clinical Scoring Systems for Thematic Apperceptive Techniques* (pp. 659–698). New York: Lawrence Erlbaum Associates.
- Genovese, J. E. C. (2008). Physique correlates with reproductive success in an archival sample of delinquent youth. *Evolutionary Psychology*, 6(3), 369–385.
- Jang, K. L., Livesley, W. J., & Vernon, P. A. (1996). Heritability of the big five personality dimensions and their facts: A twin study. *Journal of Personality*, 64(3), 577–591.
- Jang, K. L., Livesley, W. J., Ando, J., Yamagata, S., Suzuki, A., Angleitner, A., et al. (2006). Behavioral genetics of the higher-order factors of the Big Five. *Personality and Individual Differences*, 41, 261–272.

- Judge, T. A., Livingston, B. A., & Hurst, C. (2012). Do nice guys-and gals- really finish last? The joint effects of sex and agreeableness on income. *Journal of Personality and Social Psychology*, 102(2), 390–407.
- Jung, C. G. (1923). *Psychological types*. New York: Harcourt Brace.
- Jung, C. G. (1928). *Contributions to analytical psychology*. New York: Harcourt Brace Jovanovich.
- Jung, C. G. (1964). *Man and his symbols*. New York: Doubleday and Company.
- Jung, C., & Kerenyi, C. (1963). Science of mythology. In R. F. C. Hull (Ed. & Trans.), *Essays on the myth of the divine child and the mysteries of Eleusis*. New York: Harper & Row.
- Launer, J. (2005). Anna O. and the ‘talking cure.’ *QJM: An International Journal of Medicine*, 98(6), 465–466.
- Lecci, L. B. & Magnavita, J. J. (2013). *Personality theories: A scientific approach*. San Diego, CA: Bridgepoint Education.
- Lefcourt, H. M. (1982). *Locus of control: Current trends in theory and research* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Lecci, L. B. & Magnavita, J. J. (2013). *Personality theories: A scientific approach*. San Diego, CA: Bridgepoint Education.
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, 140, 1–55.
- Lilienfeld, S. O., Wood, J. M., & Garb, H. N. (2000). The scientific status of projective techniques. *Psychological Science in the Public Interest*, 1(2), 27–66.
- Maltby, J., Day, L., & Macaskill, A. (2007). *Personality, individual differences and intelligence* (3rd ed.). UK: Pearson.
- Maslow, A. H. (1970). *Motivation and personality*. New York: Harper & Row.
- Maslow, A. H. (1950). Self-actualizing people: A study of psychological health. In W. Wolff (Ed.), *Personality Symposia: Symposium 1 on Values* (pp. 11–34). New York: Grune & Stratton.
- McCrae, R. R., & Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychologist*, 52(5), 509–516.
- McCrae, R. R., et al. (2005). Universal features of personality traits from the observer’s perspective: Data from 50 cultures. *Journal of Personality and Social Psychology*, 88, 547–561.
- Mischel, W. (1993). *Introduction to personality* (5th ed.). Fort Worth, TX: Harcourt Brace Jovanovich.
- Mischel, W., Ayduk, O., Berman, M. G., Casey, B. J., Gotlib, I. H., Jonides, J., et al. (2010). ‘Willpower’ over the life span: Decomposing self-regulation. *Social Cognitive and Affective Neuroscience*, 6(2), 252–256.
- Mischel, W., Ebbesen, E. B., & Raskoff Zeiss, A. (1972). Cognitive and attentional mechanisms of delay in gratification. *Journal of Personality and Social Psychology*, 21(2), 204–218.
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102(2), 246–268.
- Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989, May 26). Delay of gratification in children. *Science*, 244, 933–938.

- Motley, M. T. (2002). Theory of slips. In E. Erwin (Ed.), *The Freud encyclopedia: Theory, therapy, and culture* (pp. 530–534). New York: Routledge.
- Noftle, E. E., & Robins, R. W. (2007). Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores. *Personality Processes and Individual Differences*, 93, 116–130.
- Noga, A. (2007). *Passions and tempers: A history of the humors*. New York: Harper Collins.
- Oyserman, D., Coon, H., & Kemmelmier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128, 3–72.
- Parnell, R.W. (1958). *Behavior and physique: An introduction to practical somatometry*. London, UK: Edward Arnold Publishers LTD.
- Peterson, J., Liivamagi, J., & Koskel, S. (2006). Associations between temperament types and body build in 17–22 year-old Estonian female students. *Papers on Anthropology*, 25, 142–149.
- Piotrowski, Z. A. (1987). *Perceptanalysis: The Rorschach method fundamentally reworked, expanded and systematized*. London, UK: Routledge.
- Rafter, N. (2007). Somatotyping, antimodernism, and the production of criminological knowledge. *Criminology*, 45, 805–833.
- Rentfrow, P. J., Gosling, S. D., Jokela, M., Stillwell, D. J., Kosinski, M., & Potter, J. (2013, October 14). Divided we stand: Three psychological regions of the United States and their political, economic, social, and health correlates. *Journal of Personality and Social Psychology*, 105(6), 996–1012.
- Roesler, C. (2012). Are archetypes transmitted more by culture than biology? Questions arising from conceptualizations of the archetype. *Journal of Analytical Psychology*, 57(2), 223–246.
- Rogers, C. (1980). *A way of being*. Boston, MA: Houghton Mifflin.
- Rosenbaum, R. (1995, January 15). The great Ivy League posture photo scandal. *The New York Times*, pp. A26.
- Rothbart, M. K. (2011). *Becoming who we are: Temperament and personality in development*. New York: Guilford Press.
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: Origins and outcomes. *Journal of Personality and Social Psychology*, 78(1), 122–135.
- Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament. In M. E. Lamb & A. L. Brown (Eds.), *Advances in developmental psychology* (Vol. 1, pp. 37–86). Hillsdale, NJ: Erlbaum.
- Rothbart, M. K., Sheese, B. E., Rueda, M. R., & Posner, M. I. (2011). Developing mechanisms of self-regulation in early life. *Emotion Review*, 3(2), 207–213.
- Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcements. *Psychological Monographs*, 80, 609.
- Rotter, J. B., & Rafferty, J. E. (1950). *Manual the Rotter Incomplete Sentences Blank College Form*. New York: The Psychological Corporation.
- Sanford, R. N., Adkins, M. M., Miller, R. B., & Cobb, E. A. (1943). Physique, personality, and scholarship: A cooperative study of school children. *Monographs of the Society for Research in Child Development*, 8(1), 705.

- Schmitt, D. P., Allik, J., McCrae, R. R., & Benet-Martinez, V. (2007). The geographic distribution of Big Five personality traits: Patterns and profiles of human self-description across 56 nations. *Journal of Cross-Cultural Psychology*, 38, 173–212.
- Scott, J. (2005). *Electra after Freud: Myth and culture*. Ithaca: Cornell University Press.
- Segal, N. L. (2012). *Born together-reared apart: The landmark Minnesota Twin Study*. Cambridge, MA: Harvard University Press.
- Sheldon, W. H. (1940). *The varieties of human physique: An introduction to constitutional psychology*. New York: Harper and Row.
- Sheldon, W. H. (1942). *The varieties of temperament: A psychology of constitutional differences*. New York: Harper and Row.
- Sheldon, W.H. (1949). Varieties of delinquent youth: An introduction to constitutional psychology. New York: Harper and Brothers.
- Skinner, B. F. (1953). *Science and human behavior*. New York: The Free Press.
- Sotirova-Kohli, M., Opwis, K., Roesler, C., Smith, S. M., Rosen, D. H., Vaid, J., & Djnov, V. (2013). Symbol/meaning paired-associate recall: An “archetypal memory” advantage? *Behavioral Sciences*, 3, 541–561. Retrieved from http://www2.cnr.edu/home/araia/Myth_%20Body.pdf
- Stelmack, R. M., & Stalikas, A. (1991). Galen and the humour theory of temperament. *Personal Individual Difference*, 12(3), 255–263.
- Terracciano A., McCrae R. R., Brant L. J., Costa P. T., Jr. (2005). Hierarchical linear modeling analyses of the NEO-PI-R scales in the Baltimore Longitudinal Study of Aging. *Psychology and Aging*, 20, 493–506.
- Thomas, A., & Chess, S. (1977). *Temperament and development*. New York: Brunner/Mazel.
- Tok, S. (2011). The big five personality traits and risky sport participation. *Social Behavior and Personality: An International Journal*, 39(8), 1105–1111.
- Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview.
- Triandis, H. C., & Suh, E. M. (2002). Cultural influences on personality. *Annual Review of Psychology*, 53, 133–160.
- Wagerman, S. A., & Funder, D. C. (2007). Acquaintance reports of personality and academic achievement: A case for conscientiousness. *Journal of Research in Personality*, 41, 221–229.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, 96, 465–490.
- Weiner, I. B. (2003). *Principles of Rorschach interpretation*. Mahwah, N.J.: Lawrence Erlbaum.
- Whyte, C. (1980). An integrated counseling and learning center. In K. V. Lauridsen (Ed.), *Examining the scope of learning centers* (pp. 33–43). San Francisco, CA: Jossey-Bass.
- Whyte, C. (1978). Effective counseling methods for high-risk college freshmen. *Measurement and Evaluation in Guidance*, 6(4), 198–200.
- Whyte, C. B. (1977). High-risk college freshman and locus of control. *The Humanist Educator*, 16(1), 2–5.
- Williams, R. L. (1972). *Themes Concerning Blacks: Manual*. St. Louis, MO: Williams.

- Wundt, W. (1874/1886). *Elements du psychologie, physiologique* (2ieme tome). [Elements of physiological psychology, Vol. 2]. (E. Rouvier, Trans.). Paris: Ancienne Librairie Germer Bailliere et Cie.
- Yang, K. S. (2006). Indigenous personality research: The Chinese case. In U. Kim, K.-S. Yang, & K.-K. Hwang (Eds.), *Indigenous and cultural psychology: Understanding people in context* (pp. 285–314). New York: Springer.
- Young-Eisendrath, P. (1995). *Myth and body: Pandora's legacy in a post-modern world*. Retrieved from http://www2.cnr.edu/home/araia/Myth_%20Body.pdf

PART XII

SOCIAL PSYCHOLOGY



Trayvon Martin, 17, was shot to death at the hands of George Zimmerman, a volunteer neighborhood watchman, in 2012. Was his death the result of self-defense or racial bias? That question drew hundreds of people to rally on each side of this heated debate. (credit “signs”: modification of work by David Shankbone; credit “walk”: modification of work by “Fibonacci Blue”/Flickr)

Humans are diverse, and sometimes our differences make it challenging for us to get along with one another. A poignant example is that of Trayvon Martin, a 17-year-old African American who was shot by a neighborhood watch volunteer, George Zimmerman, in a predominantly White neighborhood in 2012. Zimmerman grew suspicious of the boy dressed in a hoodie and pursued Martin. A physical altercation ended with Zimmerman fatally shooting Martin. Zimmerman claimed that he acted in self-defense; Martin was unarmed. A Florida jury found Zimmerman not guilty of second degree murder nor of manslaughter.

Several groups protested what they deemed racial profiling and brutality against an unarmed Black male. Zimmerman, who has a Peruvian mother and a German father, was accused of being racist. Some media coverage was criticized for inflaming racial politics in their coverage. In spite of conflicts such as these, people also work together to create positive change. For example, after the 9/11 terrorist attacks, people rallied together and charitable donations skyrocketed (Brown & Minty, 2006). This chapter explores how the presence of other people influences the behavior of individuals, dyads, and groups. Social factors can determine whether human behavior tends toward conflict or harmony.

58.

WHAT IS SOCIAL PSYCHOLOGY?

Learning Objectives

By the end of this section, you will be able to:

- Define social psychology
- Describe situational versus dispositional influences on behavior
- Describe the fundamental attribution error

Social psychology *examines how people affect one another, and it looks at the power of the situation.* Social psychologists assert that an individual's thoughts, feelings, and behaviors are very much influenced by social situations. Essentially, people will change their behavior to align with the social situation at hand. If we are in a new situation or are unsure how to behave, we will take our cues from other individuals.

The field of social psychology studies topics at both the intra- and interpersonal levels. Intrapersonal topics (those that pertain to the individual) include emotions and attitudes, the self, and social cognition (the ways in which we think about ourselves and others). Interpersonal topics (those that pertain to dyads and groups) include helping behavior, aggression, prejudice and discrimination, attraction and close relationships, and group processes and intergroup relationships.



Social psychology deals with all kinds of interactions between people, spanning a wide range of how we connect: from moments of confrontation to moments of working together and helping others, as shown here. (credit: Sgt. Derec Pierson, U.S. Army)

Social psychologists focus on how people construe or interpret situations and how these interpretations influence their thoughts, feelings, and behaviors (Ross & Nisbett, 1991). Thus, social psychology studies individuals in a social context and how situational variables interact to influence behavior. In this chapter, we discuss the intrapersonal processes of self-presentation, cognitive dissonance and attitude change, and the interpersonal processes of conformity and obedience, aggression and altruism, and, finally, love and attraction.

Situational and Dispositional Influences on Behavior

Behavior is a product of both the situation (e.g., cultural influences, social roles, and the presence of bystanders) and of the person (e.g., personality characteristics). Subfields of psychology tend to focus on one influence or behavior over others. Situationism is the view that our behavior and actions are determined by our immediate environment and surroundings. In contrast, dispositionism holds that our behavior is determined by internal factors (Heider, 1958). An internal factor is an attribute of a person and includes personality traits and temperament. Social psychologists have tended to take the situationist perspective, whereas personality psychologists have promoted the dispositionist perspective. Modern approaches to social psychology, however, take both the situation and the individual into account when studying human behavior (Fiske, Gilbert, & Lindzey, 2010). In fact, the field of social-personality psychology has emerged to study the complex interaction

of internal and situational factors that affect human behavior (Mischel, 1977; Richard, Bond, & Stokes-Zoota, 2003).

Fundamental Attribution Error

In the United States, the predominant culture tends to favor a dispositional approach in explaining human behavior. Why do you think this is? We tend to think that people are in control of their own behaviors, and, therefore, any behavior change must be due to something internal, such as their personality, habits, or temperament. According to some social psychologists, people tend to overemphasize internal factors as explanations—or attributions—for the behavior of other people. They tend to assume that the behavior of another person is a *trait* of that person, and to underestimate the power of the situation on the behavior of others. They tend to fail to recognize when the behavior of another is due to situational variables, and thus to the person's *state*. This erroneous assumption is called the fundamental attribution error (Ross, 1977; Riggio & Garcia, 2009). To better understand, imagine this scenario: Greg returns home from work, and upon opening the front door his wife happily greets him and inquires about his day. Instead of greeting his wife, Greg yells at her, "Leave me alone!" Why did Greg yell at his wife? How would someone committing the fundamental attribution error explain Greg's behavior? The most common response is that Greg is a mean, angry, or unfriendly person (his traits). This is an internal or dispositional explanation. However, imagine that Greg was just laid off from his job due to company downsizing. Would your explanation for Greg's behavior change? Your revised explanation might be that Greg was frustrated and disappointed for losing his job; therefore, he was in a bad mood (his state). This is now an external or situational explanation for Greg's behavior.

The fundamental attribution error is so powerful that people often overlook obvious situational influences on behavior. A classic example was demonstrated in a series of experiments known as the quizmaster study (Ross, Amabile, & Steinmetz, 1977). Student participants were randomly assigned to play the role of a questioner (the quizmaster) or a contestant in a quiz game. Questioners developed difficult questions to which they knew the answers, and they presented these questions to the contestants. The contestants answered the questions correctly only 4 out of 10 times. After the task, the questioners and contestants were asked to rate their own general knowledge compared to the average student. Questioners did not rate their general knowledge higher than the contestants, but the contestants rated the questioners' intelligence higher than their own. In a second study, observers of the interaction also rated the questioner as having more general knowledge than the contestant. The obvious influence on performance is the situation. The questioners wrote the questions, so of course they had an advantage. Both the contestants and observers made an internal attribution for the performance. They concluded that the questioners must be more intelligent than the contestants.



In the quizmaster study, people tended to disregard the influence of the situation and wrongly concluded that a questioner's knowledge was greater than their own. (credit: Steve Jurvetson)

As demonstrated in the example above, the fundamental attribution error is considered a powerful influence in how we explain the behaviors of others. However, it should be noted that some researchers have suggested that the fundamental attribution error may not be as powerful as it is often portrayed. In fact, a recent review of more than 173 published studies suggests that several factors (e.g., high levels of idiosyncrasy of the character and how well hypothetical events are explained) play a role in determining just how influential the fundamental attribution error is (Malle, 2006).

Is the Fundamental Attribution Error a Universal Phenomenon?

You may be able to think of examples of the fundamental attribution error in your life. Do people in all cultures commit the fundamental attribution error? Research suggests that they do not. People from an individualistic culture, that is, a culture that focuses on individual achievement and autonomy, have the greatest tendency to commit the fundamental attribution error. Individualistic cultures, which tend to be found in western countries such as the United States, Canada, and the United Kingdom, promote a focus on the individual. Therefore, a person's disposition is thought to be the primary explanation for her behavior. In contrast, people from a collectivistic culture, that is, a culture that focuses on communal relationships with others, such as family, friends, and community, are less likely to commit the fundamental attribution error (Markus & Kitayama, 1991; Triandis, 2001).



(a)



(b)



(c)

People from collectivistic cultures, such as some Asian cultures, are more likely to emphasize relationships with others than to focus primarily on the individual. Activities such as (a) preparing a meal, (b) hanging out, and (c) playing a game engage people in a group. (credit a: modification of work by Arian Zwegers; credit b: modification of work by “conbon33”/Flickr; credit c: modification of work by Anja Disseldorp)

Why do you think this is the case? Collectivistic cultures, which tend to be found in East Asian countries and in Latin American and African countries, focus on the group more than on the individual (Nisbett, Peng, Choi, & Norenzayan, 2001). This focus on others provides a broader perspective that takes into account both situational and cultural influences on behavior; thus, a more nuanced explanation of the causes of others' behavior becomes more likely.

Characteristics of Individualistic and Collectivistic Cultures

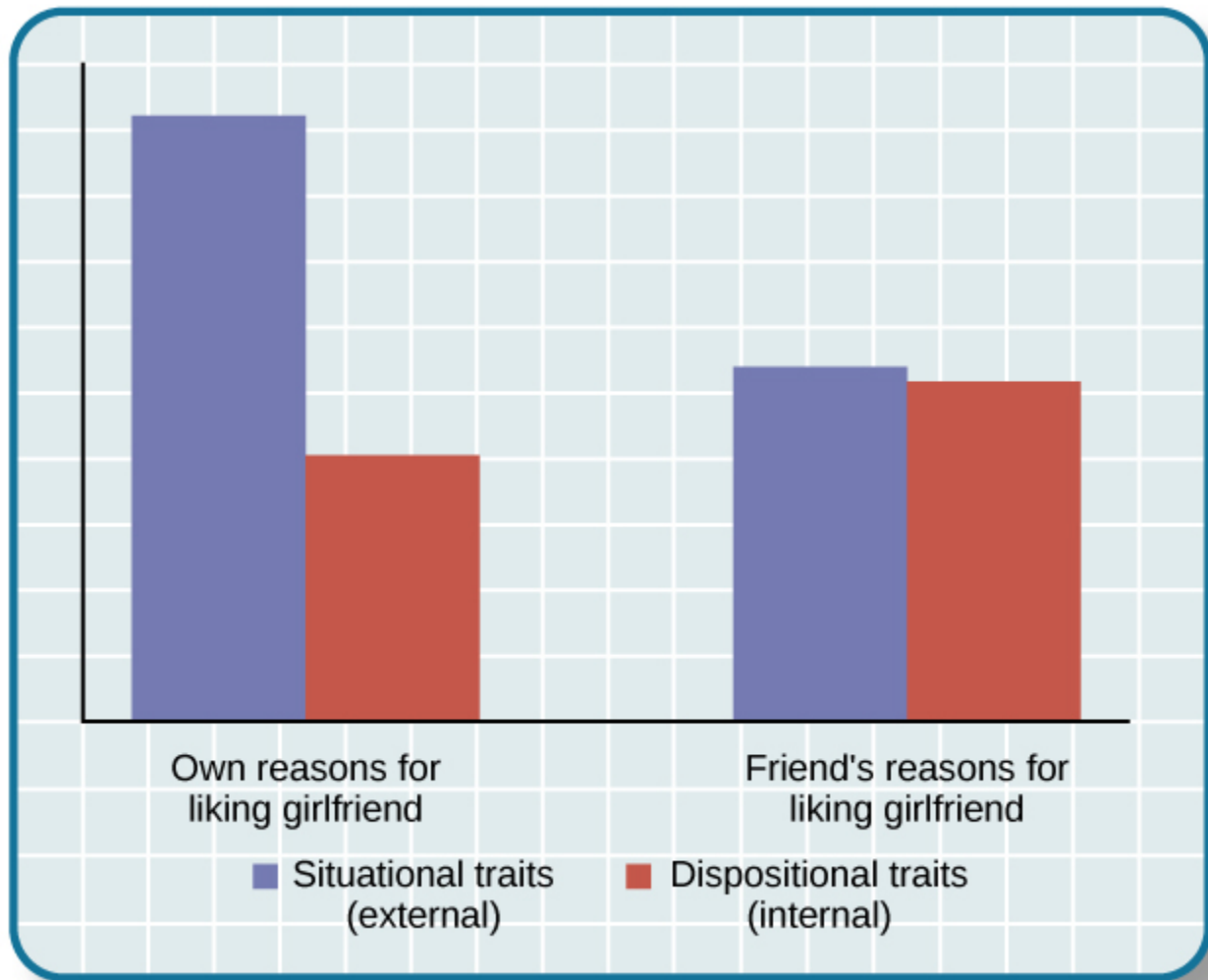
Individualistic Culture	Collectivistic Culture
Achievement oriented	Relationship oriented
Focus on autonomy	Focus on group autonomy
Dispositional perspective	Situational perspective
Independent	Interdependent
Analytic thinking style	Holistic thinking style

Actor-Observer Bias

Returning to our earlier example, Greg knew that he lost his job, but an observer would not know. So a naïve observer would tend to attribute Greg's hostile behavior to Greg's disposition rather than to the true, situational cause. Why do you think we underestimate the influence of the situation on the behaviors of others? One reason is that we often don't have all the information we need to make a situational explanation for another person's behavior. The only information we might have is what is observable. Due to this lack of information we have a tendency to assume the behavior is due to a dispositional, or internal, factor. When it comes to explaining our own behaviors, however, we have much more information available to us. If you

came home from school or work angry and yelled at your dog or a loved one, what would your explanation be? You might say you were very tired or feeling unwell and needed quiet time—a situational explanation. The **actor-observer bias** is *the phenomenon of attributing other people's behavior to internal factors (fundamental attribution error) while attributing our own behavior to situational forces* (Jones & Nisbett, 1971; Nisbett, Caputo, Legant, & Marecek, 1973; Choi & Nisbett, 1998). As actors of behavior, we have more information available to explain our own behavior. However as observers, we have less information available; therefore, we tend to default to a dispositionist perspective.

One study on the actor-observer bias investigated reasons male participants gave for why they liked their girlfriend (Nisbett et al., 1973). When asked why participants liked their own girlfriend, participants focused on internal, dispositional qualities of their girlfriends (for example, her pleasant personality). The participants' explanations rarely included causes internal to themselves, such as dispositional traits (for example, "I need companionship"). In contrast, when speculating why a male friend likes his girlfriend, participants were equally likely to give dispositional and external explanations. This supports the idea that actors tend to provide few internal explanations but many situational explanations for their own behavior. In contrast, observers tend to provide more dispositional explanations for a friend's behavior.



Actor-observer bias is evident when subjects explain their own reasons for liking a girlfriend versus their impressions of others' reasons for liking a girlfriend.

Self-Serving Bias

Following an outcome, **self-serving bias** are those *attributions that enable us to see ourselves in favorable light* (for example, making internal attributions for success and external attributions for failures). When you do well at a task—for example, acing an exam—it is in your best interest to make a dispositional attribution for your behavior (“I’m smart”) instead of a situational one (“The exam was easy”). The tendency of an individual to take credit by making dispositional or internal attributions for positive outcomes but situational or external attributions for negative outcomes is known as the self-serving bias (Miller & Ross, 1975). This bias serves to protect self-esteem. You can imagine that if people always made situational attributions for their behavior, they would never be able to take credit and feel good about their accomplishments.

We can understand self-serving bias by digging more deeply into attribution, a belief about the cause

of a result. One model of attribution proposes three main dimensions: locus of control (internal versus external), stability (stable versus unstable), and controllability (controllable versus uncontrollable). In this context, stability refers to the extent to which the circumstances that result in a given outcome are changeable. The circumstances are considered stable if they are unlikely to change. Controllability refers to the extent to which the circumstances that are associated with a given outcome can be controlled. Obviously, those things that we have the power to control would be labeled controllable (Weiner, 1979).

Consider the example of how we explain our favorite sports team's wins. Research shows that we make internal, stable, and controllable attributions for our team's victory (Grove, Hanrahan, & McInman, 1991). For example, we might tell ourselves that our team is talented (internal), consistently works hard (stable), and uses effective strategies (controllable). In contrast, we are more likely to make external, unstable, and uncontrollable attributions when our favorite team loses. For example, we might tell ourselves that the other team has more experienced players or that the referees were unfair (external), the other team played at home (unstable), and the cold weather affected our team's performance (uncontrollable).



We tend to believe that our team wins because it's better, but loses for reasons it cannot control (Roesch & Amirkham, 1997). (credit: "TheAHL"/Flickr)

Just-World Hypothesis

One consequence of westerners' tendency to provide dispositional explanations for behavior is victim blame (Jost & Major, 2001). When people experience bad fortune, others tend to assume that they somehow are responsible for their own fate. A common ideology, or worldview, in the United States is the just-world hypothesis. The **just-world hypothesis** is *the belief that people get the outcomes they deserve* (Lerner & Miller, 1978). In order to maintain the belief that the world is a fair place, people tend to think that good people

experience positive outcomes, and bad people experience negative outcomes (Jost, Banaji, & Nosek, 2004; Jost & Major, 2001). The ability to think of the world as a fair place, where people get what they deserve, allows us to feel that the world is predictable and that we have some control over our life outcomes (Jost et al., 2004; Jost & Major, 2001). For example, if you want to experience positive outcomes, you just need to work hard to get ahead in life.

Can you think of a negative consequence of the just-world hypothesis? One negative consequence is people's tendency to blame poor individuals for their plight. What common explanations are given for why people live in poverty? Have you heard statements such as, "The poor are lazy and just don't want to work" or "Poor people just want to live off the government"? What types of explanations are these, dispositional or situational? These dispositional explanations are clear examples of the fundamental attribution error. Blaming poor people for their poverty ignores situational factors that impact them, such as high unemployment rates, recession, poor educational opportunities, and the familial cycle of poverty. Other research shows that people who hold just-world beliefs have negative attitudes toward people who are unemployed and people living with AIDS (Sutton & Douglas, 2005). In the United States and other countries, victims of sexual assault may find themselves blamed for their abuse. Victim advocacy groups, such as Domestic Violence Ended (DOVE), attend court in support of victims to ensure that blame is directed at the perpetrators of sexual violence, not the victims.



People who hold just-world beliefs tend to blame the people in poverty for their circumstances, ignoring situational and cultural causes of poverty. (credit: Adrian Miles)

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=740#h5p-200>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=740#h5p-201>

Critical Thinking Questions

Compare and contrast situational influences and dispositional influences and give an example of each. Explain how situational influences and dispositional influences might explain inappropriate behavior.

A situationism view is that our behaviors are determined by the situation—for example, a person who is late for work claims that heavy traffic caused the delay. A dispositional view is

that our behaviors are determined by personality traits—for example, a driver in a road rage incident claims the driver who cut her off is an aggressive person. Thus, a situational view tends to provide an excuse for inappropriate behavior, and a dispositional view tends to lay blame for inappropriate behavior.

Provide an example of how people from individualistic and collectivistic cultures would differ in explaining why they won an important sporting event.

People from individualistic cultures would tend to attribute athletic success to individual hard work and ability. People from collectivistic cultures would tend to attribute athletic success to the team working together and the support and encouragement of the coach.

Personal Application Questions

Provide a personal example of an experience in which your behavior was influenced by the power of the situation.

Think of an example in the media of a sports figure—player or coach—who gives a self-serving attribution for winning or losing. Examples might include accusing the referee of incorrect calls, in the case of losing, or citing their own hard work and talent, in the case of winning.

Summary

Social psychology is the subfield of psychology that studies the power of the situation to influence individuals' thoughts, feelings, and behaviors. Psychologists categorize the causes of human behavior as those due to internal factors, such as personality, or those due to external factors, such as cultural and other social influences. Behavior is better explained, however, by using both approaches. Lay people tend to over-rely on dispositional explanations for behavior and ignore the power of situational influences, a perspective called the fundamental attribution error. People from individualistic cultures are more likely to display this bias versus people from collectivistic cultures. Our explanations for our own and others behaviors can be biased due to not having enough information about others' motivations for behaviors and by providing explanations that bolster our self-esteem.

59.

SOCIAL COGNITION

Learning Objectives

By the end of this section, you will be able to:

- Describe social roles and how they influence behavior
- Explain what social norms are and how they influence behavior
- Define script
- Describe the findings of Zimbardo's Stanford prison experiment

As you've learned, social psychology is the study of how people affect one another's thoughts, feelings, and behaviors. We have discussed situational perspectives and social psychology's emphasis on the ways in which a person's environment, including culture and other social influences, affect behavior. In this section, we examine situational forces that have a strong influence on human behavior including social roles, social norms, and scripts. We discuss how humans use the social environment as a source of information, or cues, on how to behave. Situational influences on our behavior have important consequences, such as whether we will help a stranger in an emergency or how we would behave in an unfamiliar environment.

Social Roles

One major social determinant of human behavior is our social roles. A **social role** is *a pattern of behavior that is expected of a person in a given setting or group* (Hare, 2003). Each one of us has several social roles. You may be, at the same time, a student, a parent, an aspiring teacher, a son or daughter, a spouse, and a lifeguard. How do these social roles influence your behavior? Social roles are defined by culturally shared knowledge. That is, nearly everyone in a given culture knows what behavior is expected of a person in a given role. For example, what is the social role for a student? If you look around a college classroom you will likely see students engaging

in studious behavior, taking notes, listening to the professor, reading the textbook, and sitting quietly at their desks. Of course you may see students deviating from the expected studious behavior such as texting on their phones or using Facebook on their laptops, but in all cases, the students that you observe are attending class—a part of the social role of students.



Being a student is just one of the many social roles you have. (credit: "University of Michigan MSIS"/Flickr)

Social roles, and our related behavior, can vary across different settings. How do you behave when you are engaging in the role of son or daughter and attending a family function? Now imagine how you behave when you are engaged in the role of employee at your workplace. It is very likely that your behavior will be different. Perhaps you are more relaxed and outgoing with your family, making jokes and doing silly things. But at your workplace you might speak more professionally, and although you may be friendly, you are also serious and focused on getting the work completed. These are examples of how our social roles influence and often dictate our behavior to the extent that identity and personality can vary with context (that is, in different social groups) (Malloy, Albright, Kenny, Agatstein & Winquist, 1997).

Social Norms

As discussed previously, social roles are defined by a culture's shared knowledge of what is expected behavior of an individual in a specific role. This shared knowledge comes from social norms. A **social norm** is *a group's expectation of what is appropriate and acceptable behavior for its members*—how they are supposed to behave and think (Deutsch & Gerard, 1955; Berkowitz, 2004). How are we expected to act? What are we expected to talk about? What are we expected to wear? In our discussion of social roles we noted that colleges have social norms for students' behavior in the role of student and workplaces have social norms for employees' behaviors

in the role of employee. Social norms are everywhere including in families, gangs, and on social media outlets. What are some social norms on Facebook?

Tweens, Teens, and Social Norms

My 11-year-old daughter, Jessica, recently told me she needed shorts and shirts for the summer, and that she wanted me to take her to a store at the mall that is popular with preteens and teens to buy them. I have noticed that many girls have clothes from that store, so I tried teasing her. I said, “All the shirts say ‘Aero’ on the front. If you are wearing a shirt like that and you have a substitute teacher, and the other girls are all wearing that type of shirt, won’t the substitute teacher think you are all named ‘Aero’?”

My daughter replied, in typical 11-year-old fashion, “Mom, you are not funny. Can we please go shopping?”

I tried a different tactic. I asked Jessica if having clothing from that particular store will make her popular. She replied, “No, it will not make me popular. It is what the popular kids wear. It will make me feel happier.” How can a label or name brand make someone feel happier?

Think back to what you’ve learned about lifespan development. What is it about pre-teens and young teens that make them want to fit in? Does this change over time? Think back to your high school experience, or look around your college campus. What is the main name brand clothing you see? What messages do we get from the media about how to fit in?



Young people struggle to become independent at the same time they are desperately trying to fit in with their peers. (credit: Monica Arellano-Ongpin)

Scripts

Because of social roles, people tend to know what behavior is expected of them in specific, familiar settings. A

script is a person's knowledge about the sequence of events expected in a specific setting (Schank & Abelson, 1977). How do you act on the first day of school, when you walk into an elevator, or are at a restaurant? For example, at a restaurant in the United States, if we want the server's attention, we try to make eye contact. In Brazil, you would make the sound "psst" to get the server's attention. You can see the cultural differences in scripts. To an American, saying "psst" to a server might seem rude, yet to a Brazilian, trying to make eye contact might not seem an effective strategy. Scripts are important sources of information to guide behavior in given situations. Can you imagine being in an unfamiliar situation and not having a script for how to behave? This could be uncomfortable and confusing. How could you find out about social norms in an unfamiliar culture?

Zimbardo's Stanford Prison Experiment

The famous Stanford prison experiment, conducted by social psychologist Philip Zimbardo and his colleagues at Stanford University, demonstrated the power of social roles, social norms, and scripts. In the summer of 1971, an advertisement was placed in a California newspaper asking for male volunteers to participate in a study about the psychological effects of prison life. More than 70 men volunteered, and these volunteers then underwent psychological testing to eliminate candidates who had underlying psychiatric issues, medical issues, or a history of crime or drug abuse. The pool of volunteers was whittled down to 24 healthy male college students. Each student was paid \$15 per day and was randomly assigned to play the role of either a prisoner or a guard in the study. Based on what you have learned about research methods, why is it important that participants were randomly assigned?

A mock prison was constructed in the basement of the psychology building at Stanford. Participants assigned to play the role of prisoners were "arrested" at their homes by Palo Alto police officers, booked at a police station, and subsequently taken to the mock prison. The experiment was scheduled to run for several weeks. To the surprise of the researchers, both the "prisoners" and "guards" assumed their roles with zeal. In fact, on day 2, some of the prisoners revolted, and the guards quelled the rebellion by threatening the prisoners with night sticks. In a relatively short time, the guards came to harass the prisoners in an increasingly sadistic manner, through a complete lack of privacy, lack of basic comforts such as mattresses to sleep on, and through degrading chores and late-night counts.

The prisoners, in turn, began to show signs of severe anxiety and hopelessness—they began tolerating the guards' abuse. Even the Stanford professor who designed the study and was the head researcher, Philip Zimbardo, found himself acting as if the prison was real and his role, as prison supervisor, was real as well. After only six days, the experiment had to be ended due to the participants' deteriorating behavior. Zimbardo explained,

At this point it became clear that we had to end the study. We had created an overwhelmingly powerful situation—a situation in which prisoners were withdrawing and behaving in pathological ways, and in which some of the guards were behaving sadistically. Even the "good" guards felt helpless to intervene, and none of the

guards quit while the study was in progress. Indeed, it should be noted that no guard ever came late for his shift, called in sick, left early, or demanded extra pay for overtime work. (Zimbardo, 2013)

The Stanford prison experiment demonstrated the power of social roles, norms, and scripts in affecting human behavior. The guards and prisoners enacted their social roles by engaging in behaviors appropriate to the roles: The guards gave orders and the prisoners followed orders. Social norms require guards to be authoritarian and prisoners to be submissive. When prisoners rebelled, they violated these social norms, which led to upheaval. The specific acts engaged by the guards and the prisoners derived from scripts. For example, guards degraded the prisoners by forcing them to do push-ups and by removing all privacy. Prisoners rebelled by throwing pillows and trashing their cells. Some prisoners became so immersed in their roles that they exhibited symptoms of mental breakdown; however, according to Zimbardo, none of the participants suffered long-term harm (Alexander, 2001).

The Stanford Prison Experiment has some parallels with the abuse of prisoners of war by U.S. Army troops and CIA personnel at the Abu Ghraib prison in 2003 and 2004. The offenses at Abu Ghraib were documented by photographs of the abuse, some taken by the abusers themselves.



Iraqi prisoners of war were abused by their American captors in Abu Ghraib prison, during the second Iraq war. (credit: United States Department of Defense)

Visit this website to hear an NPR interview with Philip Zimbardo where he discusses the parallels between the Stanford prison experiment and the Abu Ghraib prison in Iraq: [Prison Psychology and the Stanford Prison Experiment](#).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=742#h5p-203>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=742#h5p-204>

Critical Thinking Questions

Why didn't the "good" guards in the Stanford prison experiment object to other guards' abusive behavior? Were the student prisoners simply weak people? Why didn't they object to being abused?

The good guards were fulfilling their social roles and they did not object to other guards' abusive behavior because of the power of the situation. In addition, the prison supervisor's behavior sanctioned the guards' negative treatment of prisoners. The prisoners were not weak people; they were recruited because they were healthy, mentally stable adults. The power of their social role influenced them to engage in subservient prisoner behavior. The script for prisoners is to accept abusive behavior from authority figures, especially for punishment, when they do not follow the rules.

Describe how social roles, social norms, and scripts were evident in the Stanford prison experiment. How can this experiment be applied to everyday life? Are there any more recent examples where people started fulfilling a role and became abusive?

Social roles were in play as each participant acted out behaviors appropriate to his role as prisoner, guard, or supervisor. Scripts determined the specific behaviors the guards and prisoners displayed, such as humiliation and passivity. The social norms of a prison environment sanctions abuse of prisoners since they have lost many of their human rights and became the property of the government. This experiment can be applied to other situations in which social norms, roles, and scripts dictate our behavior, such as in mob behavior. A more recent example of similar behavior was the abuse of prisoners by American soldiers who were working as prison guards at the Abu Ghraib prison in Iraq.

Personal Application Questions

Try attending a religious service very different from your own and see how you feel and behave without knowing the appropriate script. Or, try attending an important, personal event that you have never attended before, such as a bar mitzvah (a coming-of-age ritual in Jewish culture), a quinceañera (in some Latin American cultures a party is given to a girl who is turning 15 years old), a wedding, a funeral, or a sporting event new to you, such as horse racing or bull riding. Observe and record your feelings and behaviors in this unfamiliar setting for which you lack the appropriate script. Do you silently observe the action, or do you ask another

person for help interpreting the behaviors of people at the event? Describe in what ways your behavior would change if you were to attend a similar event in the future?

Name and describe at least three social roles you have adopted for yourself. Why did you adopt these roles? What are some roles that are expected of you, but that you try to resist?

Summary

Human behavior is largely influenced by our social roles, norms, and scripts. In order to know how to act in a given situation, we have shared cultural knowledge of how to behave depending on our role in society. Social norms dictate the behavior that is appropriate or inappropriate for each role. Each social role has scripts that help humans learn the sequence of appropriate behaviors in a given setting. The famous Stanford prison experiment is an example of how the power of the situation can dictate the social roles, norms, and scripts we follow in a given situation, even if this behavior is contrary to our typical behavior.

60.

ATTITUDES AND PERSUASION

Learning Objectives

By the end of this section, you will be able to:

- Define attitude
- Describe how people's attitudes are internally changed through cognitive dissonance
- Explain how people's attitudes are externally changed through persuasion
- Describe the peripheral and central routes to persuasion

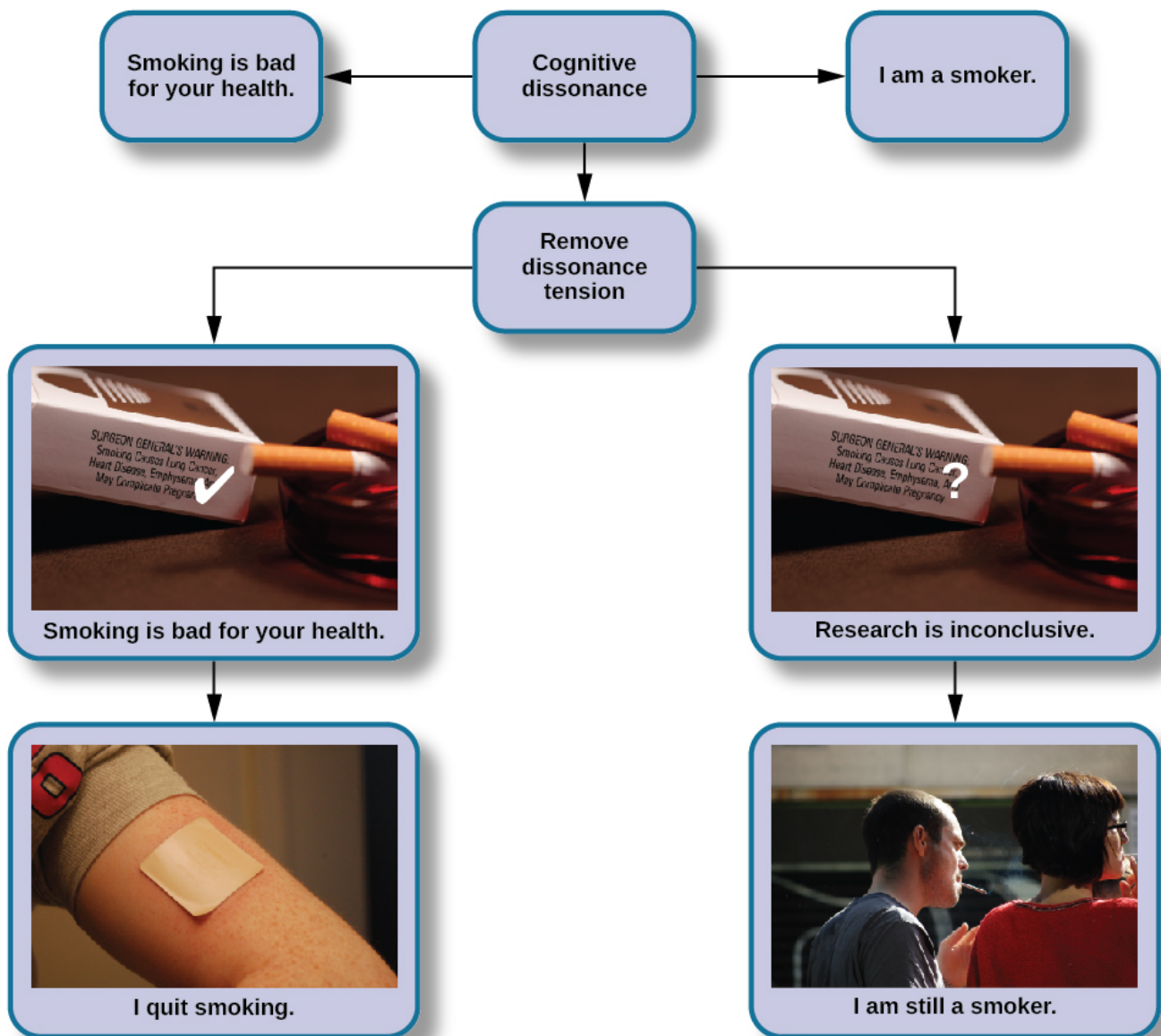
Social psychologists have documented how the power of the situation can influence our behaviors. Now we turn to how the power of the situation can influence our attitudes and beliefs. **Attitude** is *our evaluation of a person, an idea, or an object*. We have attitudes for many things ranging from products that we might pick up in the supermarket to people around the world to political policies. Typically, attitudes are favorable or unfavorable: positive or negative (Eagly & Chaiken, 1993). And, they have three components: an affective component (feelings), a behavioral component (the effect of the attitude on behavior), and a cognitive component (belief and knowledge) (Rosenberg & Hovland, 1960).

For example, you may hold a positive attitude toward recycling. This attitude should result in positive feelings toward recycling (such as “It makes me feel good to recycle” or “I enjoy knowing that I make a small difference in reducing the amount of waste that ends up in landfills”). Certainly, this attitude should be reflected in our behavior: You actually recycle as often as you can. Finally, this attitude will be reflected in favorable thoughts (for example, “Recycling is good for the environment” or “Recycling is the responsible thing to do”).

Our attitudes and beliefs are not only influenced by external forces, but also by internal influences that we control. Like our behavior, our attitudes and thoughts are not always changed by situational pressures, but they can be consciously changed by our own free will. In this section we discuss the conditions under which we would want to change our own attitudes and beliefs.

What is Cognitive Dissonance?

Social psychologists have documented that feeling good about ourselves and maintaining positive self-esteem is a powerful motivator of human behavior (Tavris & Aronson, 2008). In the United States, members of the predominant culture typically think very highly of themselves and view themselves as good people who are above average on many desirable traits (Ehrlinger, Gilovich, & Ross, 2005). Often, our behavior, attitudes, and beliefs are affected when we experience a threat to our self-esteem or positive self-image. Psychologist Leon Festinger (1957) defined **cognitive dissonance** as *psychological discomfort arising from holding two or more inconsistent attitudes, behaviors, or cognitions* (thoughts, beliefs, or opinions). Festinger's theory of cognitive dissonance states that when we experience a conflict in our behaviors, attitudes, or beliefs that runs counter to our positive self-perceptions, we experience psychological discomfort (dissonance). For example, if you believe smoking is bad for your health but you continue to smoke, you experience conflict between your belief and behavior.



Cognitive dissonance is aroused by inconsistent beliefs and behaviors. Believing cigarettes are bad for your health, but smoking cigarettes anyway, can cause cognitive dissonance. To reduce cognitive dissonance, individuals can change their behavior, as in quitting smoking, or change their belief, such as discounting the evidence that smoking is harmful. (credit “cigarettes”: modification of work by CDC/Debora Cartagena; “patch”: modification of “RegBarc”/Wikimedia Commons; “smoking”: modification of work by Tim Parkinson)

Later research documented that only conflicting cognitions that threaten individuals’ positive self-image cause dissonance (Greenwald & Ronis, 1978). Additional research found that dissonance is not only psychologically uncomfortable but also can cause physiological arousal (Croyle & Cooper, 1983) and activate regions of the brain important in emotions and cognitive functioning (van Veen, Krug, Schooler, & Carter, 2009). When we experience cognitive dissonance, we are motivated to decrease it because it is psychologically, physically,

and mentally uncomfortable. We can reduce cognitive dissonance by bringing our cognitions, attitudes, and behaviors in line—that is, making them harmonious. This can be done in different ways, such as:

- changing our discrepant behavior (e.g., stop smoking),
- changing our cognitions through rationalization or denial (e.g., telling ourselves that health risks can be reduced by smoking filtered cigarettes),
- adding a new cognition (e.g., “Smoking suppresses my appetite so I don’t become overweight, which is good for my health.”).

A classic example of cognitive dissonance is John, a 20-year-old who enlists in the military. During boot camp he is awakened at 5:00 a.m., is chronically sleep deprived, yelled at, covered in sand flea bites, physically bruised and battered, and mentally exhausted. It gets worse. Recruits that make it to week 11 of boot camp have to do 54 hours of continuous training.



A person who has chosen a difficult path must deal with cognitive dissonance in addition to many other discomforts. (credit: Tyler J. Bolken)

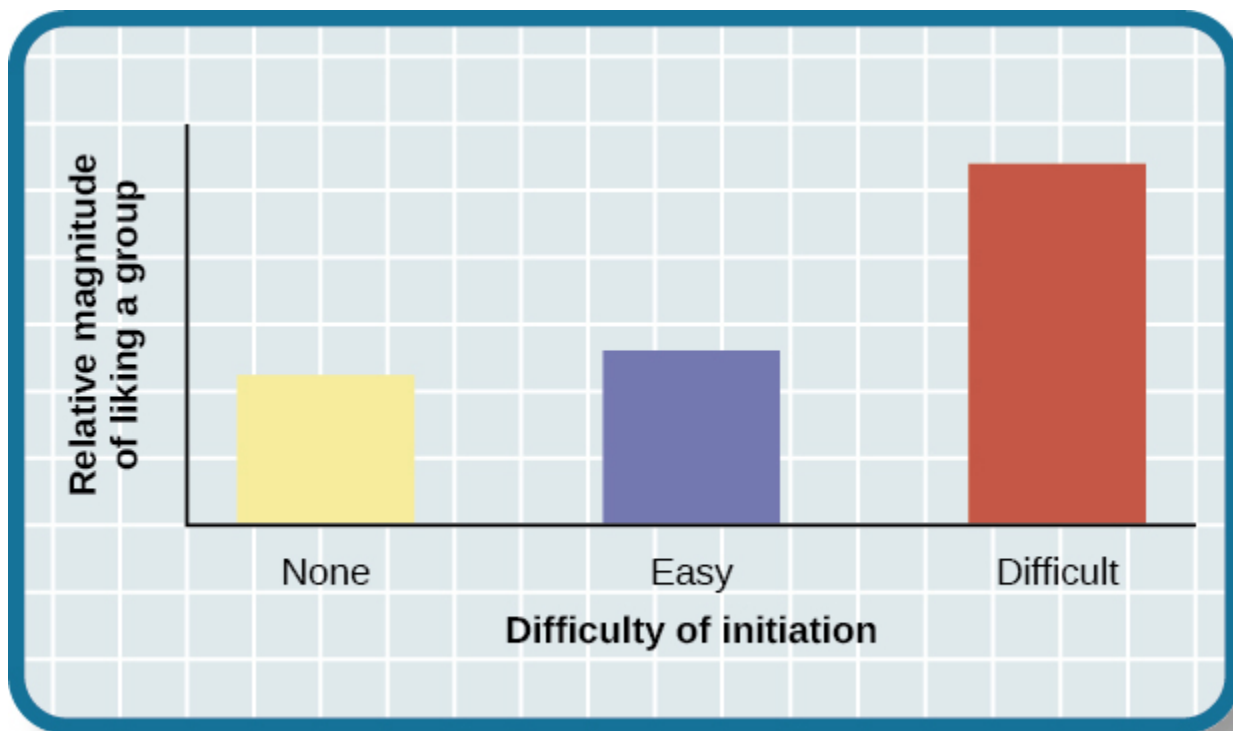
Not surprisingly, John is miserable. No one likes to be miserable. In this type of situation, people can change their beliefs, their attitudes, or their behaviors. The last option, a change of behaviors, is not available to John. He has signed on to the military for four years, and he cannot legally leave.

If John keeps thinking about how miserable he is, it is going to be a very long four years. He will be in a constant state of cognitive dissonance. As an alternative to this misery, John can change his beliefs or attitudes. He can tell himself, “I am becoming stronger, healthier, and sharper. I am learning discipline and how to defend myself and my country. What I am doing is really important.” If this is his belief, he will realize that he

is becoming stronger through his challenges. He then will feel better and not experience cognitive dissonance, which is an uncomfortable state.

The Effect of Initiation

The military example demonstrates the observation that a difficult initiation into a group influences us to like the group *more*, due to the justification of effort. We do not want to have wasted time and effort to join a group that we eventually leave. A classic experiment by Aronson and Mills (1959) demonstrated this justification of effort effect. College students volunteered to join a campus group that would meet regularly to discuss the psychology of sex. Participants were randomly assigned to one of three conditions: no initiation, an easy initiation, and a difficult initiation into the group. After participating in the first discussion, which was deliberately made very boring, participants rated how much they liked the group. Participants who underwent a difficult initiation process to join the group rated the group more favorably than did participants with an easy initiation or no initiation.



Justification of effort has a distinct effect on a person liking a group. Students in the difficult initiation condition liked the group more than students in other conditions due to the justification of effort.

Similar effects can be seen in a more recent study of how student effort affects course evaluations. Heckert, Latier, Ringwald-Burton, and Drazen (2006) surveyed 463 undergraduates enrolled in courses at a midwestern university about the amount of effort that their courses required of them. In addition, the students were also

asked to evaluate various aspects of the course. Given what you've just read, it will come as no surprise that those courses that were associated with the highest level of effort were evaluated as being more valuable than those that did not. Furthermore, students indicated that they learned more in courses that required more effort, regardless of the grades that they received in those courses (Heckert et al., 2006).

Besides the classic military example and group initiation, can you think of other examples of cognitive dissonance? Here is one: Marco and Maria live in Fairfield County, Connecticut, which is one of the wealthiest areas in the United States and has a very high cost of living. Marco telecommutes from home and Maria does not work outside of the home. They rent a very small house for more than \$3,000 a month. Maria shops at consignment stores for clothes and economizes where she can. They complain that they never have any money and that they cannot buy anything new. When asked why they do not move to a less expensive location, since Marco telecommutes, they respond that Fairfield County is beautiful, they love the beaches, and they feel comfortable there. How does the theory of cognitive dissonance apply to Marco and Maria's choices?

Persuasion

In the previous section we discussed that the motivation to reduce cognitive dissonance leads us to change our attitudes, behaviors, and/or cognitions to make them consonant. **Persuasion** is *the process of changing our attitude toward something based on some kind of communication*. Much of the persuasion we experience comes from outside forces. How do people convince others to change their attitudes, beliefs, and behaviors? What communications do you receive that attempt to persuade you to change your attitudes, beliefs, and behaviors?



We encounter attempts at persuasion attempts everywhere. Persuasion is not limited to formal advertising; we are confronted with it throughout our everyday world. (credit: Robert Couse-Baker)

A subfield of social psychology studies persuasion and social influence, providing us with a plethora of information on how humans can be persuaded by others.

Yale Attitude Change Approach

The topic of persuasion has been one of the most extensively researched areas in social psychology (Fiske et al., 2010). During the Second World War, Carl Hovland extensively researched persuasion for the U.S. Army. After the war, Hovland continued his exploration of persuasion at Yale University. Out of this work came a model called the Yale attitude change approach, which describes the conditions under which people tend to change their attitudes. Hovland demonstrated that certain features of the source of a persuasive message, the content of the message, and the characteristics of the audience will influence the persuasiveness of a message (Hovland, Janis, & Kelley, 1953).

Features of the source of the persuasive message include the credibility of the speaker (Hovland & Weiss, 1951) and the physical attractiveness of the speaker (Eagly & Chaiken, 1975; Petty, Wegener, & Fabrigar, 1997). Thus, speakers who are credible, or have expertise on the topic, and who are deemed as trustworthy are more persuasive than less credible speakers. Similarly, more attractive speakers are more persuasive than less attractive speakers. The use of famous actors and athletes to advertise products on television and in print relies on this

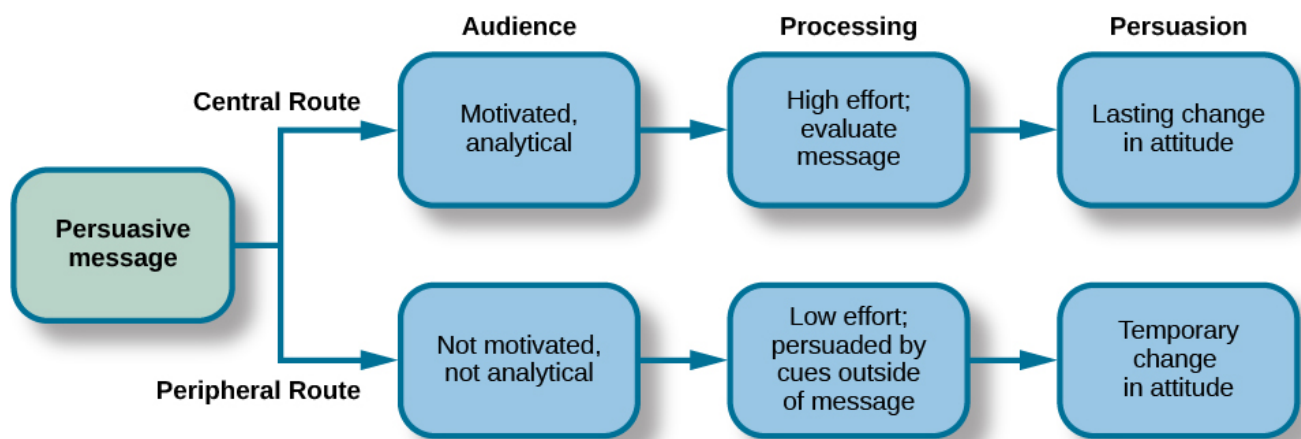
principle. The immediate and long term impact of the persuasion also depends, however, on the credibility of the messenger (Kumkale & Albarracín, 2004).

Features of the message itself that affect persuasion include subtlety (the quality of being important, but not obvious) (Petty & Cacioppo, 1986; Walster & Festinger, 1962); sidedness (that is, having more than one side) (Crowley & Hoyer, 1994; Igou & Bless, 2003; Lumsdaine & Janis, 1953); timing (Haugtvedt & Wegener, 1994; Miller & Campbell, 1959), and whether both sides are presented. Messages that are more subtle are more persuasive than direct messages. Arguments that occur first, such as in a debate, are more influential if messages are given back-to-back. However, if there is a delay after the first message, and before the audience needs to make a decision, the last message presented will tend to be more persuasive (Miller & Campbell, 1959).

Features of the audience that affect persuasion are attention (Albarracín & Wyer, 2001; Festinger & Maccoby, 1964), intelligence, self-esteem (Rhodes & Wood, 1992), and age (Krosnick & Alwin, 1989). In order to be persuaded, audience members must be paying attention. People with lower intelligence are more easily persuaded than people with higher intelligence; whereas people with moderate self-esteem are more easily persuaded than people with higher or lower self-esteem (Rhodes & Wood, 1992). Finally, younger adults aged 18–25 are more persuadable than older adults.

Elaboration Likelihood Model

An especially popular model that describes the dynamics of persuasion is the elaboration likelihood model of persuasion (Petty & Cacioppo, 1986). The elaboration likelihood model considers the variables of the attitude change approach—that is, features of the source of the persuasive message, contents of the message, and characteristics of the audience are used to determine when attitude change will occur. According to the elaboration likelihood model of persuasion, there are two main routes that play a role in delivering a persuasive message: central and peripheral.



Persuasion can take one of two paths, and the durability of the end result depends on the path.

The central route is logic driven and uses data and facts to convince people of an argument's worthiness. For example, a car company seeking to persuade you to purchase their model will emphasize the car's safety features and fuel economy. This is a direct route to persuasion that focuses on the quality of the information. In order for the central route of persuasion to be effective in changing attitudes, thoughts, and behaviors, the argument must be strong and, if successful, will result in lasting attitude change.

The central route to persuasion works best when the target of persuasion, or the audience, is analytical and willing to engage in processing of the information. From an advertiser's perspective, what products would be best sold using the central route to persuasion? What audience would most likely be influenced to buy the product? One example is buying a computer. It is likely, for example, that small business owners might be especially influenced by the focus on the computer's quality and features such as processing speed and memory capacity.

The peripheral route is an indirect route that uses peripheral cues to associate positivity with the message (Petty & Cacioppo, 1986). Instead of focusing on the facts and a product's quality, the peripheral route relies on association with positive characteristics such as positive emotions and celebrity endorsement. For example, having a popular athlete advertise athletic shoes is a common method used to encourage young adults to purchase the shoes. This route to attitude change does not require much effort or information processing. This method of persuasion may promote positivity toward the message or product, but it typically results in less permanent attitude or behavior change. The audience does not need to be analytical or motivated to process the message. In fact, a peripheral route to persuasion may not even be noticed by the audience, for example in the strategy of product placement. Product placement refers to putting a product with a clear brand name or brand identity in a TV show or movie to promote the product (Gupta & Lord, 1998). For example, one season of the reality series *American Idol* prominently showed the panel of judges drinking out of cups that displayed the Coca-Cola logo. What other products would be best sold using the peripheral route to persuasion? Another example is clothing: A retailer may focus on celebrities that are wearing the same style of clothing.

Foot-in-the-door Technique

Researchers have tested many persuasion strategies that are effective in selling products and changing people's attitude, ideas, and behaviors. One effective strategy is the foot-in-the-door technique (Cialdini, 2001; Pliner, Hart, Kohl, & Saari, 1974). Using the foot-in-the-door technique, the persuader gets a person to agree to bestow a small favor or to buy a small item, only to later request a larger favor or purchase of a bigger item. The foot-in-the-door technique was demonstrated in a study by Freedman and Fraser (1966) in which participants who agreed to post small sign in their yard or sign a petition were more likely to agree to put a large sign in their yard than people who declined the first request. Research on this technique also illustrates the principle of consistency (Cialdini, 2001): Our past behavior often directs our future behavior, and we have a desire to maintain consistency once we have committed to a behavior.



(a)



(b)

With the foot-in-the-door technique, a small request such as (a) wearing a campaign button can turn into a large request, such as (b) putting campaign signs in your yard. (credit a: modification of work by Joe Crawford; credit b: modification of work by “shutterblog”/Flickr)

A common application of foot-in-the-door is when teens ask their parents for a small permission (for example, extending curfew by a half hour) and then asking them for something larger. Having granted the smaller request increases the likelihood that parents will acquiesce with the later, larger request.

How would a store owner use the foot-in-the-door technique to sell you an expensive product? For example, say that you are buying the latest model smartphone, and the salesperson suggests you purchase the best data plan. You agree to this. The salesperson then suggests a bigger purchase—the three-year extended warranty. After agreeing to the smaller request, you are more likely to also agree to the larger request. You may have encountered this if you have bought a car. When salespeople realize that a buyer intends to purchase a certain model, they might try to get the customer to pay for many or most available options on the car.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it

online here:

<https://louis.pressbooks.pub/intropsychology/?p=744#h5p-206>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=744#h5p-207>

Critical Thinking Questions

Give an example (one not used in class or your text) of cognitive dissonance and how an individual might resolve this.

One example is choosing which college to attend—the public school close to home or the Ivy League school out of state. Since both schools are desirable, the student is likely to experience cognitive dissonance in making this decision. In order to justify choosing the public school close to home, the student could change her cognition about Ivy League school, asserting that it is too expensive and the quality of education at the public school is just as good. She could change

her attitude toward the Ivy League school and determine that the students there are too stuffy and wouldn't make good classmates.

Imagine that you work for an advertising agency, and you've been tasked with developing an advertising campaign to increase sales of Bliss Soda. How would you develop an advertisement for this product that uses a central route of persuasion? How would you develop an ad using a peripheral route of persuasion?

Although potential answers will vary, advertisements using the central route of persuasion might involve a doctor listing logical reasons for drinking this product. For example, the doctor might cite research suggesting that the soda is better than alternatives because of its reduced calorie content, lack of adverse health consequences, etc. An advertisement using a peripheral route of persuasion might show very attractive people consuming the product while spending time on a beautiful, sunny beach.

Personal Application Questions

Cognitive dissonance often arises after making an important decision, called post-decision dissonance (or in popular terms, buyer's remorse). Describe a recent decision you made that caused dissonance and describe how you resolved it.

Describe a time when you or someone you know used the foot-in-the-door technique to gain someone's compliance.

Summary

Attitudes are our evaluations or feelings toward a person, idea, or object and typically are positive or negative. Our attitudes and beliefs are influenced not only by external forces, but also by internal influences that we control. An internal form of attitude change is cognitive dissonance or the tension we experience when our thoughts, feelings, and behaviors are in conflict. In order to reduce dissonance, individuals can change their behavior, attitudes, or cognitions, or add a new cognition. External forces of persuasion include advertising; the features of advertising that influence our behaviors include the source, message, and audience. There are two primary routes to persuasion. The central route to persuasion uses facts and information to persuade

potential consumers. The peripheral route uses positive association with cues such as beauty, fame, and positive emotions.

61.

CONFORMITY, COMPLIANCE, AND OBEDIENCE

Learning Objectives

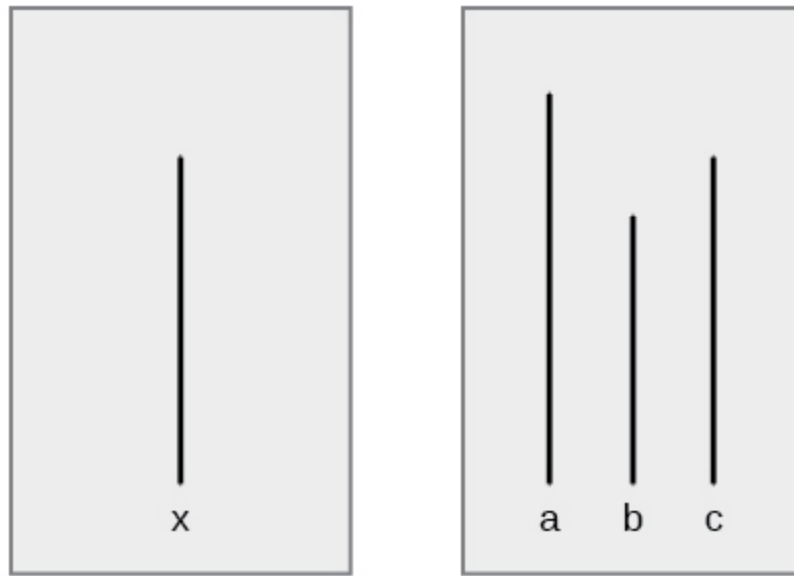
By the end of this section, you will be able to:

- Explain the Asch effect
- Define conformity and types of social influence
- Describe Stanley Milgram's experiment and its implications
- Define groupthink, social facilitation, and social loafing

In this section, we discuss additional ways in which people influence others. The topics of conformity, social influence, obedience, and group processes demonstrate the power of the social situation to change our thoughts, feelings, and behaviors. We begin this section with a discussion of a famous social psychology experiment that demonstrated how susceptible humans are to outside social pressures.

Conformity

Solomon Asch conducted several experiments in the 1950s to determine how people are affected by the thoughts and behaviors of other people. In one study, a group of participants was shown a series of printed line segments of different lengths: a, b, and c. Participants were then shown a fourth line segment: x. They were asked to identify which line segment from the first group (a, b, or c) most closely resembled the fourth line segment in length.



These line segments illustrate the judgment task in Asch's conformity study. Which line on the right—a, b, or c—is the same length as line x on the left?

Each group of participants had only one true, naïve subject. The remaining members of the group were confederates of the researcher. A confederate is a person who is aware of the experiment and works for the researcher. Confederates are used to manipulate social situations as part of the research design, and the true, naïve participants believe that confederates are, like them, uninformed participants in the experiment. In Asch's study, the confederates identified a line segment that was obviously shorter than the target line—a wrong answer. The naïve participant then had to identify aloud the line segment that best matched the target line segment.

How often do you think the true participant aligned with the confederates' response? That is, how often do you think the group influenced the participant, and the participant gave the wrong answer? Asch (1955) found that 76% of participants conformed to group pressure at least once by indicating the incorrect line. Conformity is the change in a person's behavior to go along with the group, even if he does not agree with the group. Why would people give the wrong answer? What factors would increase or decrease someone giving in or conforming to group pressure?

The **Asch effect** is *the influence of the group majority on an individual's judgment*.

What factors make a person more likely to yield to group pressure? Research shows that the size of the majority, the presence of another dissenter, and the public or relatively private nature of responses are key influences on conformity.

- The size of the majority: The greater the number of people in the majority, the more likely an individual will conform. There is, however, an upper limit: a point where adding more members does not increase conformity. In Asch's study, conformity increased with the number of people in the majority—up to seven individuals. At numbers beyond seven, conformity leveled off and decreased slightly (Asch, 1955).

- The presence of another dissenter: If there is at least one dissenter, conformity rates drop to near zero (Asch, 1955).
- The public or private nature of the responses: When responses are made publicly (in front of others), conformity is more likely; however, when responses are made privately (e.g., writing down the response), conformity is less likely (Deutsch & Gerard, 1955).

The finding that conformity is more likely to occur when responses are public than when they are private is the reason government elections require voting in secret, so we are not coerced by others. The Asch effect can be easily seen in children when they have to publicly vote for something. For example, if the teacher asks whether the children would rather have extra recess, no homework, or candy, once a few children vote, the rest will comply and go with the majority. In a different classroom, the majority might vote differently, and most of the children would comply with that majority. When someone's vote changes if it is made in public versus private, this is known as compliance. Compliance can be a form of conformity. Compliance is going along with a request or demand, even if you do not agree with the request. In Asch's studies, the participants complied by giving the wrong answers, but privately did not accept that the obvious wrong answers were correct.



Voting for government officials in the United States is private to reduce the pressure of conformity. (credit: Nicole Klauss)

Now that you have learned about the Asch line experiments, why do you think the participants conformed? The correct answer to the line segment question was obvious, and it was an easy task. Researchers have categorized the motivation to conform into two types: normative social influence and informational social influence (Deutsch & Gerard, 1955).

In normative social influence, people conform to the group norm to fit in, to feel good, and to be accepted

by the group. However, with informational social influence, people conform because they believe the group is competent and has the correct information, particularly when the task or situation is ambiguous. What type of social influence was operating in the Asch conformity studies? Since the line judgment task was unambiguous, participants did not need to rely on the group for information. Instead, participants complied to fit in and avoid ridicule, an instance of normative social influence.

An example of informational social influence may be what to do in an emergency. Imagine that you are in a movie theater watching a film and what seems to be smoke comes in the theater from under the emergency exit door. You are not certain that it is smoke—it might be a special effect for the movie, such as a fog machine. When you are uncertain you will tend to look at the behavior of others in the theater. If other people show concern and get up to leave, you are likely to do the same. However, if others seem unconcerned, you are likely to stay put and continue watching the movie.



(a)



(b)

People in crowds tend to take cues from others and act accordingly. (a) An audience is listening to a lecture and people are relatively quiet, still, and attentive to the speaker on the stage. (b) An audience is at a rock concert where people are dancing, singing, and possibly engaging in activities like crowd surfing. (credit a: modification of work by Matt Brown; credit b: modification of work by Christian Holmér)

How would you have behaved if you were a participant in Asch's study? Many students say they would not conform, that the study is outdated, and that people nowadays are more independent. To some extent this may be true. Research suggests that overall rates of conformity may have reduced since the time of Asch's research. Furthermore, efforts to replicate Asch's study have made it clear that many factors determine how likely it is that someone will demonstrate conformity to the group. These factors include the participant's age, gender, and socio-cultural background (Bond & Smith, 1996; Larsen, 1990; Walker & Andrade, 1996).

Watch this video to see a replication of the Asch experiment: [conformity](#).



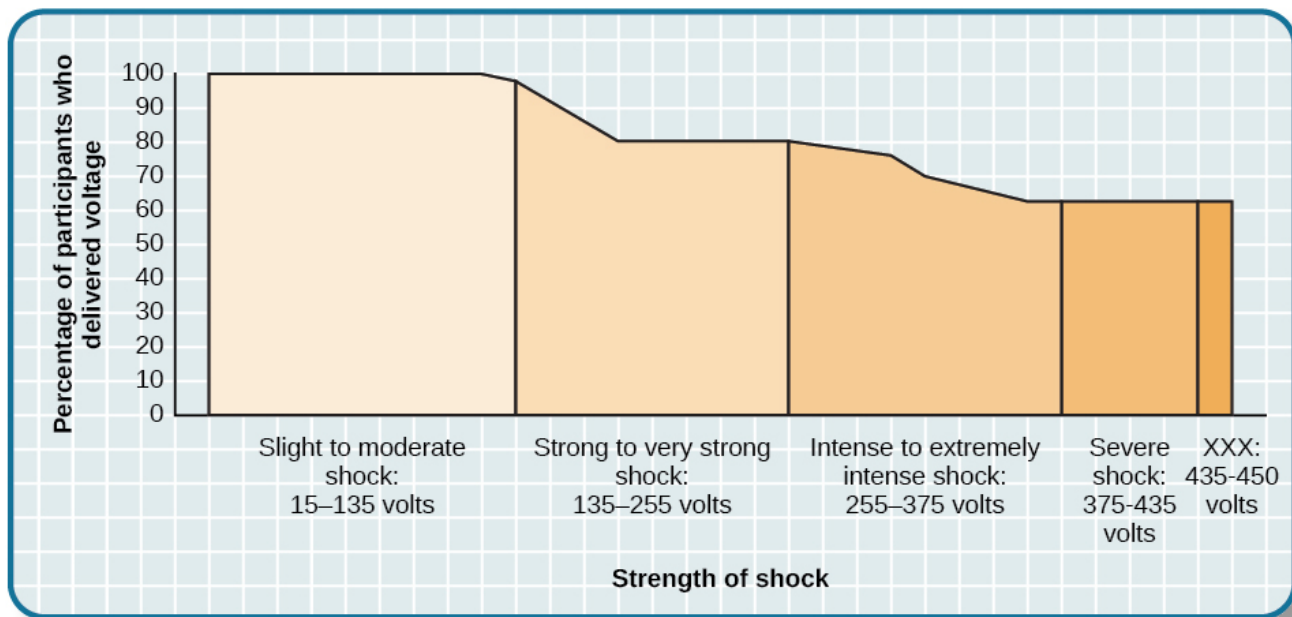
One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=746#oembed-1>

Stanley Milgram's Experiment

Conformity is one effect of the influence of others on our thoughts, feelings, and behaviors. Another form of social influence is obedience to authority. **Obedience** is *the change of an individual's behavior to comply with a demand by an authority figure*. People often comply with the request because they are concerned about a consequence if they do not comply. To demonstrate this phenomenon, we review another classic social psychology experiment.

Stanley Milgram was a social psychology professor at Yale who was influenced by the trial of Adolf Eichmann, a Nazi war criminal. Eichmann's defense for the atrocities he committed was that he was "just following orders." Milgram (1963) wanted to test the validity of this defense, so he designed an experiment and initially recruited 40 men for his experiment. The volunteer participants were led to believe that they were participating in a study to improve learning and memory. The participants were told that they were to teach other students (learners) correct answers to a series of test items. The participants were shown how to use a device that they were told delivered electric shocks of different intensities to the learners. The participants were told to shock the learners if they gave a wrong answer to a test item—that the shock would help them to learn. The participants gave (or believed they gave) the learners shocks, which increased in 15-volt increments, all the way up to 450 volts. The participants did not know that the learners were confederates and that the confederates did not actually receive shocks.

In response to a string of incorrect answers from the learners, the participants obediently and repeatedly shocked them. The confederate learners cried out for help, begged the participant teachers to stop, and even complained of heart trouble. Yet, when the researcher told the participant-teachers to continue the shock, 65% of the participants continued the shock to the maximum voltage and to the point that the learner became unresponsive. What makes someone obey authority to the point of potentially causing serious harm to another person?



The Milgram experiment showed the surprising degree to which people obey authority. Two out of three (65%) participants continued to administer shocks to an unresponsive learner.

Several variations of the original Milgram experiment were conducted to test the boundaries of obedience. When certain features of the situation were changed, participants were less likely to continue to deliver shocks (Milgram, 1965). For example, when the setting of the experiment was moved to an office building, the percentage of participants who delivered the highest shock dropped to 48%. When the learner was in the same room as the teacher, the highest shock rate dropped to 40%. When the teachers' and learners' hands were touching, the highest shock rate dropped to 30%. When the researcher gave the orders by phone, the rate dropped to 23%. These variations show that when the humanity of the person being shocked was increased, obedience decreased. Similarly, when the authority of the experimenter decreased, so did obedience.

This case is still very applicable today. What does a person do if an authority figure orders something done? What if the person believes it is incorrect, or worse, unethical? In a study by Martin and Bull (2008), midwives privately filled out a questionnaire regarding best practices and expectations in delivering a baby. Then, a more senior midwife and supervisor asked the junior midwives to do something they had previously stated they were opposed to. Most of the junior midwives were obedient to authority, going against their own beliefs.

Groupthink

When in group settings, we are often influenced by the thoughts, feelings, and behaviors around us. Whether it is due to normative or informational social influence, groups have power to influence individuals. Another phenomenon of group conformity is groupthink. **Groupthink** is *the modification of the opinions of members of*

a group to align with what they believe is the group consensus (Janis, 1972). In group situations, the group often takes action that individuals would not perform outside the group setting because groups make more extreme decisions than individuals do. Moreover, groupthink can hinder opposing trains of thought. This elimination of diverse opinions contributes to faulty decision by the group.

Groupthink in the U.S. Government

There have been several instances of groupthink in the U.S. government. One example occurred when the United States led a small coalition of nations to invade Iraq in March 2003. This invasion occurred because a small group of advisors and former President George W. Bush were convinced that Iraq represented a significant terrorism threat with a large stockpile of weapons of mass destruction at its disposal. Although some of these individuals may have had some doubts about the credibility of the information available to them at the time, in the end, the group arrived at a consensus that Iraq had weapons of mass destruction and represented a significant threat to national security. It later came to light that Iraq did not have weapons of mass destruction, but not until the invasion was well underway. As a result, 6,000 American soldiers were killed and many more civilians died. How did the Bush administration arrive at their conclusions?

Why does groupthink occur? There are several causes of groupthink, which makes it preventable. When the group is highly cohesive, or has a strong sense of connection, maintaining group harmony may become more important to the group than making sound decisions. If the group leader is directive and makes his opinions known, this may discourage group members from disagreeing with the leader. If the group is isolated from hearing alternative or new viewpoints, groupthink may be more likely. How do you know when groupthink is occurring?

There are several symptoms of groupthink including the following:

- perceiving the group as invulnerable or invincible—believing it can do no wrong
- believing the group is morally correct
- self-censorship by group members, such as withholding information to avoid disrupting the group consensus
- the quashing of dissenting group members' opinions
- the shielding of the group leader from dissenting views
- perceiving an illusion of unanimity among group members
- holding stereotypes or negative attitudes toward the out-group or others with differing viewpoints (Janis, 1972)

Given the causes and symptoms of groupthink, how can it be avoided? There are several strategies that can improve group decision making including seeking outside opinions, voting in private, having the leader

withhold position statements until all group members have voiced their views, conducting research on all viewpoints, weighing the costs and benefits of all options, and developing a contingency plan (Janis, 1972; Mitchell & Eckstein, 2009).

Group Polarization

Another phenomenon that occurs within group settings is group polarization. **Group polarization** (Teger & Pruitt, 1967) is *the strengthening of an original group attitude after the discussion of views within a group*. That is, if a group initially favors a viewpoint, after discussion the group consensus is likely a stronger endorsement of the viewpoint. Conversely, if the group was initially opposed to a viewpoint, group discussion would likely lead to stronger opposition. Group polarization explains many actions taken by groups that would not be undertaken by individuals. Group polarization can be observed at political conventions, when platforms of the party are supported by individuals who, when not in a group, would decline to support them. A more everyday example is a group's discussion of how attractive someone is. Does your opinion change if you find someone attractive, but your friends do not agree? If your friends vociferously agree, might you then find this person even more attractive?

Social Facilitation

Not all intergroup interactions lead to the negative outcomes we have described. Sometimes being in a group situation can improve performance. **Social facilitation** *occurs when an individual performs better when an audience is watching than when the individual performs the behavior alone*. This typically occurs when people are performing a task for which they are skilled. Can you think of an example in which having an audience could improve performance? One common example is sports. Skilled basketball players will be more likely to make a free throw basket when surrounded by a cheering audience than when playing alone in the gym. However, there are instances when even skilled athletes can have difficulty under pressure. For example, if an athlete is less skilled or nervous about making a free throw, having an audience may hinder rather than help. In sum, social facilitation is likely to occur for easy tasks, or tasks at which we are skilled, but worse performance may occur when performing in front of others, depending on the task.



The attention of the crowd can motivate a skilled athlete. (credit: Tommy Gilligan/USMA)

Social Loafing

Another way in which a group presence can affect our performance is social loafing. **Social loafing** is *the exertion of less effort by a person working together with a group*. Social loafing occurs when our individual performance cannot be evaluated separately from the group. Thus, group performance declines on easy tasks (Karau & Williams, 1993). Essentially individual group members loaf and let other group members pick up the slack. Because everyone's efforts cannot be evaluated, individuals become less motivated to perform well. For example, consider a group of people cooperating to clean litter from the roadside. Some people will exert a great amount of effort, while others will exert little effort. Yet the entire job gets done, and it may not be obvious who worked hard and who didn't.

As a college student you may have experienced social loafing while working on a group project. Have you ever had to contribute more than your fair share because your fellow group members weren't putting in the work? This may happen when a professor assigns a group grade instead of individual grades. If the professor doesn't know how much effort each student contributed to a project, some students may be inclined to let more conscientious students do more of the work. The chance of social loafing in student work groups increases as the size of the group increases (Shepperd & Taylor, 1999).

Interestingly, the opposite of social loafing occurs when the task is complex and difficult (Bond & Titus,

1983; Geen, 1989). Remember the previous discussion of choking under pressure? This happens when you perform a difficult task and your individual performance can be evaluated. In a group setting, such as the student work group, if your individual performance cannot be evaluated, there is less pressure for you to do well, and thus less anxiety or physiological arousal (Latané, Williams, & Harkens, 1979). This puts you in a relaxed state in which you can perform your best, if you choose (Zajonc, 1965). If the task is a difficult one, many people feel motivated and believe that their group needs their input to do well on a challenging project (Jackson & Williams, 1985). Given what you learned about social loafing, what advice would you give a new professor about how to design group projects? If you suggested that individuals' efforts should not be evaluated, to prevent the anxiety of choking under pressure, but that the task must be challenging, you have a good understanding of the concepts discussed in this section. Alternatively, you can suggest that individuals' efforts should be evaluated, but the task should be easy so as to facilitate performance. Good luck trying to convince your professor to only assign easy projects.

Types of Social Influence

Type of Social Influence	Description
Conformity	Changing your behavior to go along with the group even if you do not agree with the group
Compliance	Going along with a request or demand
Normative social influence	Conformity to a group norm to fit in, feel good, and be accepted by the group
Informational social influence	Conformity to a group norm prompted by the belief that the group is competent and has the correct information
Obedience	Changing your behavior to please an authority figure or to avoid aversive consequences
Groupthink	Group members modify their opinions to match what they believe is the group consensus
Group polarization	Strengthening of the original group attitude after discussing views within a group
Social facilitation	Improved performance when an audience is watching versus when the individual performs the behavior alone
Social loafing	Exertion of less effort by a person working in a group because individual performance cannot be evaluated separately from the group, thus causing performance decline on easy tasks

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=746#h5p-209>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=746#h5p-210>

Critical Thinking Questions

Describe how seeking outside opinions can prevent groupthink. Outsiders can serve as a quality control by offering diverse views and views that may differ from the leader's opinion. The outsider can also remove the illusion of invincibility by having the group's action held up to outside scrutiny. An outsider may offer additional information and uncover information that group members withheld.

Compare and contrast social loafing and social facilitation. In social loafing individual performance cannot be evaluated; however, in social facilitation individual performance can be evaluated. Social loafing and social facilitation both occur for easy or well-known tasks and when individuals are relaxed.

Personal Application Questions

1. Conduct a conformity study the next time you are in an elevator. After you enter the elevator, stand with your back toward the door. See if others conform to your behavior. Did your results turn out as expected?
2. Most students adamantly state that they would never have turned up the voltage in the [Milgram experiment](#). Do you think you would have refused to shock the learner? Looking at your own past behavior, what evidence suggests that you would go along with the order to increase the voltage?

Summary

The power of the situation can lead people to conform, or go along with the group, even in the face of inaccurate information. Conformity to group norms is driven by two motivations, the desire to fit in and be liked and the desire to be accurate and gain information from the group. Authority figures also have influence over our behaviors, and many people become obedient and follow orders even if the orders are contrary to their personal values. Conformity to group pressures can also result in groupthink, or the faulty decision-making process that results from cohesive group members trying to maintain group harmony. Group situations can improve human behavior through facilitating performance on easy tasks but inhibiting performance on difficult tasks. The presence of others can also lead to social loafing when individual efforts cannot be evaluated.

62.

PREJUDICE AND DISCRIMINATION

Learning Objectives

By the end of this section, you will be able to:

- Define and distinguish among prejudice, stereotypes, and discrimination
- Provide examples of prejudice, stereotypes, and discrimination
- Explain why prejudice and discrimination exist

Human conflict can result in crime, war, and mass murder, such as genocide. Prejudice and discrimination often are root causes of human conflict, which explains how strangers come to hate one another to the extreme of causing others harm. Prejudice and discrimination affect everyone. In this section we will examine the definitions of prejudice and discrimination, examples of these concepts, and causes of these biases.



(a)



(b)



(c)

Prejudice and discrimination occur across the globe. (a) A 1939 sign in German-occupied Poland warns “No Entrance for Poles!” (b) An African American male drinks from a designated “colored” water fountain in Oklahoma in 1939 during the era of racial segregation as a practice of discrimination. (c) A member of the Westboro Baptist Church, widely identified as a hate group, engages in discrimination based on religion and sexual orientation. (credit b: modification of work by United States Farm Security Administration; credit c: modification of work by “JCWilmore”/Wikimedia Commons)

Understanding Prejudice and Discrimination

As we discussed in the opening story of Trayvon Martin, humans are very diverse and although we share many similarities, we also have many differences. The social groups we belong to help form our identities (Tajfel, 1974). These differences may be difficult for some people to reconcile, which may lead to prejudice toward people who are different. Prejudice is a negative attitude and feeling toward an individual based solely on one's membership in a particular social group (Allport, 1954; Brown, 2010). Prejudice is common against people who are members of an unfamiliar cultural group. Thus, certain types of education, contact, interactions, and building relationships with members of different cultural groups can reduce the tendency toward prejudice. In fact, simply imagining interacting with members of different cultural groups might affect prejudice. Indeed, when experimental participants were asked to imagine themselves positively interacting with someone from a different group, this led to an increased positive attitude toward the other group and an increase in positive traits associated with the other group. Furthermore, imagined social interaction can reduce anxiety associated with inter-group interactions (Crisp & Turner, 2009). What are some examples of social groups that you belong to that contribute to your identity? Social groups can include gender, race, ethnicity, nationality, social class, religion, sexual orientation, profession, and many more. And, as is true for social roles, you can simultaneously be a member of more than one social group. An example of prejudice is having a negative attitude toward people who are not born in the United States. Although people holding this prejudiced attitude do not know all people who were not born in the United States, they dislike them due to their status as foreigners.

Can you think of a prejudiced attitude you have held toward a group of people? How did your prejudice develop? Prejudice often begins in the form of a stereotype—that is, a specific belief or assumption about individuals based solely on their membership in a group, regardless of their individual characteristics. Stereotypes become overgeneralized and applied to all members of a group. For example, someone holding prejudiced attitudes toward older adults, may believe that older adults are slow and incompetent (Cuddy, Norton, & Fiske, 2005; Nelson, 2004). We cannot possibly know each individual person of advanced age to know that all older adults are slow and incompetent. Therefore, this negative belief is overgeneralized to all members of the group, even though many of the individual group members may in fact be spry and intelligent.

Another example of a well-known stereotype involves beliefs about racial differences among athletes. As Hodge, Burden, Robinson, and Bennett (2008) point out, Black male athletes are often believed to be more athletic, yet less intelligent, than their White male counterparts. These beliefs persist despite several high profile examples to the contrary. Sadly, such beliefs often influence how these athletes are treated by others and how they view themselves and their own capabilities. Whether or not you agree with a stereotype, stereotypes are generally well-known within each culture (Devine, 1989).

Sometimes people will act on their prejudiced attitudes toward a group of people, and this behavior is known as discrimination. Discrimination is negative action toward an individual because of one's membership in a particular group (Allport, 1954; Dovidio & Gaertner, 2004). As a result of holding negative beliefs

(stereotypes) and negative attitudes (prejudice) about a particular group, people often treat the target of prejudice poorly, such as excluding older adults from their circle of friends. Have you ever been the target of discrimination? If so, how did this negative treatment make you feel?

Connecting Stereotypes, Prejudice, and Discrimination

Item	Function	Connection	Example
Stereotype	Cognitive; thoughts about people	Overgeneralized beliefs about people may lead to prejudice.	“Yankees fans are arrogant and obnoxious.”
Prejudice	Affective; feelings about people, both positive and negative	Feelings may influence treatment of others, leading to discrimination.	“I hate Yankees fans; they make me angry.”
Discrimination	Behavior; positive or negative treatment of others	Holding stereotypes and harboring prejudice may lead to excluding, avoiding, and biased treatment of group members.	“I would never hire nor become friends with a person if I knew he or she were a Yankees fan.”

So far, we’ve discussed stereotypes, prejudice, and discrimination as negative thoughts, feelings, and behaviors because these are typically the most problematic. However, it is important to also point out that people can hold positive thoughts, feelings, and behaviors toward individuals based on group membership; for example, they would show preferential treatment for people who are like themselves—that is, who share the same gender, race, or favorite sports team.

This video demonstrates the concepts of prejudice, stereotypes, and discrimination. In the video, a social experiment is conducted in a park where three people try to steal a bike out in the open. The race and gender of the thief is varied: a White male teenager, a Black male teenager, and a White female. Does anyone try to stop them? The treatment of the teenagers in the video demonstrates the concept of racism: [What Would You Do? Bike Theft \(White Guy, Black Guy, Pretty Girl\)](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=748#oembed-1>

Types of Prejudice and Discrimination

When we meet strangers we automatically process three pieces of information about them: their race, gender, and age (Ito & Urland, 2003). Why are these aspects of an unfamiliar person so important? Why don't we instead notice whether their eyes are friendly, whether they are smiling, their height, the type of clothes they are wearing? Although these secondary characteristics are important in forming a first impression of a stranger, the social categories of race, gender, and age provide a wealth of information about an individual. This information, however, often is based on stereotypes. We may have different expectations of strangers depending on their race, gender, and age. What stereotypes and prejudices do you hold about people who are from a race, gender, and age group different from your own?

Racism

Racism is *prejudice and discrimination against an individual based solely on one's membership in a specific racial group* (such as toward African Americans, Asian Americans, Latinos, Native Americans, European Americans). What are some stereotypes of various racial or ethnic groups? Research suggests cultural stereotypes for Asian Americans include cold, sly, and intelligent; for Latinos, cold and unintelligent; for European Americans, cold and intelligent; and for African Americans, aggressive, athletic, and more likely to be law breakers (Devine & Elliot, 1995; Fiske, Cuddy, Glick, & Xu, 2002; Sommers & Ellsworth, 2000; Dixon & Linz, 2000).

Racism exists for many racial and ethnic groups. For example, Blacks are significantly more likely to have their vehicles searched during traffic stops than Whites, particularly when Blacks are driving in predominately White neighborhoods, (a phenomenon often termed "DWB," or "driving while Black.") (Rojek, Rosenfeld, & Decker, 2012)

Mexican Americans and other Latino groups also are targets of racism from the police and other members of the community. For example, when purchasing items with a personal check, Latino shoppers are more likely than White shoppers to be asked to show formal identification (Dovidio et al., 2010).

In one case of alleged harassment by the police, several East Haven, Connecticut, police officers were arrested on federal charges due to reportedly continued harassment and brutalization of Latinos. When the accusations came out, the mayor of East Haven was asked, "What are you doing for the Latino community today?" The Mayor responded, "I might have tacos when I go home, I'm not quite sure yet" ("East Haven Mayor," 2012) This statement undermines the important issue of racial profiling and police harassment of Latinos, while belittling Latino culture by emphasizing an interest in a food product stereotypically associated with Latinos.

Racism is prevalent toward many other groups in the United States including Native Americans, Arab Americans, Jewish Americans, and Asian Americans. Have you witnessed racism toward any of these racial or ethnic groups? Are you aware of racism in your community?

One reason modern forms of racism, and prejudice in general, are hard to detect is related to the dual attitudes model (Wilson, Lindsey, & Schooler, 2000). Humans have two forms of attitudes: explicit attitudes, which are conscious and controllable, and implicit attitudes, which are unconscious and uncontrollable (Devine, 1989; Olson & Fazio, 2003). Because holding egalitarian views is socially desirable (Plant & Devine, 1998), most people do not show extreme racial bias or other prejudices on measures of their explicit attitudes. However, measures of implicit attitudes often show evidence of mild to strong racial bias or other prejudices (Greenwald, McGee, & Schwartz, 1998; Olson & Fazio, 2003).

Sexism

Sexism is *prejudice and discrimination toward individuals based on their sex*. Typically, sexism takes the form of men holding biases against women, but either sex can show sexism toward their own or their opposite sex. Like racism, sexism may be subtle and difficult to detect. Common forms of sexism in modern society include gender role expectations, such as expecting women to be the caretakers of the household. Sexism also includes people's expectations for how members of a gender group should behave. For example, women are expected to be friendly, passive, and nurturing, and when women behave in an unfriendly, assertive, or neglectful manner they often are disliked for violating their gender role (Rudman, 1998). Research by Laurie Rudman (1998) finds that when female job applicants self-promote, they are likely to be viewed as competent, but they may be disliked and are less likely to be hired because they violated gender expectations for modesty. Sexism can exist on a societal level such as in hiring, employment opportunities, and education. Women are less likely to be hired or promoted in male-dominated professions such as engineering, aviation, and construction (Blau, Ferber, & Winkler, 2010; Ceci & Williams, 2011). Have you ever experienced or witnessed sexism? Think about your family members' jobs or careers. Why do you think there are differences in the jobs women and men have, such as more women nurses but more male surgeons (Betz, 2008)?



Women now have many jobs previously closed to them, though they still face challenges in male-dominated occupations. (credit: "Alex"/Flickr)

Ageism

People often form judgments and hold expectations about people based on their age. These judgments and expectations can lead to **ageism**, or *prejudice and discrimination toward individuals based solely on their age*. Typically, ageism occurs against older adults, but ageism also can occur toward younger adults. Think of expectations you hold for older adults. How could someone's expectations influence the feelings they hold toward individuals from older age groups? Ageism is widespread in U.S. culture (Nosek, 2005), and a common ageist attitude toward older adults is that they are incompetent, physically weak, and slow (Greenberg, Schimel, & Martens, 2002) and some people consider older adults less attractive. Some cultures, however, including some Asian, Latino, and African American cultures, both outside and within the United States afford older adults respect and honor.

Ageism can also occur toward younger adults. What expectations do you hold toward younger people? Does society expect younger adults to be immature and irresponsible? How might these two forms of ageism affect a younger and older adult who are applying for a salesclerk position?

Homophobia

Another form of prejudice is **homophobia**: *prejudice and discrimination of individuals based solely on their sexual orientation*. Like ageism, homophobia is a widespread prejudice in U.S. society that is tolerated by many people (Herek & McLemore, 2013; Nosek, 2005). Negative feelings often result in discrimination, such as the exclusion of lesbian, gay, bisexual, and transgender (LGBT) people from social groups and the avoidance of LGBT neighbors and co-workers. This discrimination also extends to employers deliberately declining to hire qualified LGBT job applicants. Have you experienced or witnessed homophobia? If so, what stereotypes, prejudiced attitudes, and discrimination were evident?

Research into Homophobia

Some people are quite passionate in their hatred for nonheterosexuals in our society. In some cases, people have been tortured and/or murdered simply because they were not heterosexual. This passionate response has led some researchers to question what motives might exist for homophobic people. Adams, Wright, & Lohr (1996) conducted a study investigating this issue and their results were quite an eye-opener.

In this experiment, male college students were given a scale that assessed how homophobic they were; those with extreme scores were recruited to participate in the experiment. In the end, 64 men agreed to participate and were split into 2 groups: homophobic men and nonhomophobic men. Both groups of men were fitted with a penile plethysmograph, an instrument that measures changes in blood flow to the penis and serves as an objective measurement of sexual arousal.

All men were shown segments of sexually explicit videos. One of these videos involved a sexual interaction between a man and a woman (heterosexual clip). One video displayed two females engaged in a sexual interaction (homosexual female clip), and the final video displayed two men engaged in a sexual interaction (homosexual male clip). Changes in penile tumescence were recorded during all three clips, and a subjective measurement of sexual arousal was also obtained. While both groups of men became sexually aroused to the heterosexual and female homosexual video clips, only those men who were identified as homophobic showed sexual arousal to the homosexual male video clip. While all men reported that their erections indicated arousal for the heterosexual and female homosexual clips, the homophobic men indicated that they were not sexually aroused (despite their erections) to the male homosexual clips. Adams et al. (1996) suggest that these findings may indicate that homophobia is related to homosexual arousal that the homophobic individuals either deny or are unaware of.

Why Do Prejudice and Discrimination Exist?

Prejudice and discrimination persist in society due to social learning and conformity to social norms. Children learn prejudiced attitudes and beliefs from society: their parents, teachers, friends, the media, and other sources of socialization, such as Facebook (O’Keeffe & Clarke-Pearson, 2011). If certain types of prejudice and discrimination are acceptable in a society, there may be normative pressures to conform and share those prejudiced beliefs, attitudes, and behaviors. For example, public and private schools are still somewhat segregated by social class. Historically, only children from wealthy families could afford to attend private schools, whereas children from middle- and low-income families typically attended public schools. If a child from a low-income family received a merit scholarship to attend a private school, how might the child be treated by classmates? Can you recall a time when you held prejudiced attitudes or beliefs or acted in a discriminatory manner because your group of friends expected you to?

Stereotypes and Self-Fulfilling Prophecy

When we hold a stereotype about a person, we have expectations that he or she will fulfill that stereotype. A **self-fulfilling prophecy** is *an expectation held by a person that alters his or her behavior in a way that tends to make it true*. When we hold stereotypes about a person, we tend to treat the person according to our expectations. This treatment can influence the person to act according to our stereotypic expectations, thus confirming our stereotypic beliefs. Research by Rosenthal and Jacobson (1968) found that disadvantaged students whose teachers expected them to perform well had higher grades than disadvantaged students whose teachers expected them to do poorly.

Consider this example of cause and effect in a self-fulfilling prophecy: If an employer expects an openly gay male job applicant to be incompetent, the potential employer might treat the applicant negatively during the

interview by engaging in less conversation, making little eye contact, and generally behaving coldly toward the applicant (Hebl, Foster, Mannix, & Dovidio, 2002). In turn, the job applicant will perceive that the potential employer dislikes him, and he will respond by giving shorter responses to interview questions, making less eye contact, and generally disengaging from the interview. After the interview, the employer will reflect on the applicant's behavior, which seemed cold and distant, and the employer will conclude, based on the applicant's poor performance during the interview, that the applicant was in fact incompetent. Thus, the employer's stereotype—gay men are incompetent and do not make good employees—is reinforced. Do you think this job applicant is likely to be hired? Treating individuals according to stereotypic beliefs can lead to prejudice and discrimination.

Another dynamic that can reinforce stereotypes is confirmation bias. When interacting with the target of our prejudice, we tend to pay attention to information that is consistent with our stereotypic expectations and ignore information that is inconsistent with our expectations. In this process, known as **confirmation bias**, we *seek out information that supports our stereotypes and ignore information that is inconsistent with our stereotypes* (Wason & Johnson-Laird, 1972). In the job interview example, the employer may not have noticed that the job applicant was friendly and engaging, and that he provided competent responses to the interview questions in the beginning of the interview. Instead, the employer focused on the job applicant's performance in the later part of the interview, after the applicant changed his demeanor and behavior to match the interviewer's negative treatment.

Have you ever fallen prey to the self-fulfilling prophecy or confirmation bias, either as the source or target of such bias? How might we stop the cycle of the self-fulfilling prophecy? Social class stereotypes of individuals tend to arise when information about the individual is ambiguous. If information is unambiguous, stereotypes do not tend to arise (Baron et al., 1995).

In-Groups and Out-Groups

As discussed previously in this section, we all belong to a gender, race, age, and social economic group. These groups provide a powerful source of our identity and self-esteem (Tajfel & Turner, 1979). These groups serve as our in-groups. An **in-group** is *a group that we identify with or see ourselves as belonging to*. A group that we don't belong to, or an **out-group**, is *a group that we view as fundamentally different from us*. For example, if you are female, your gender in-group includes all females, and your gender out-group includes all males. People often view gender groups as being fundamentally different from each other in personality traits, characteristics, social roles, and interests. Because we often feel a strong sense of belonging and emotional connection to our in-groups, we develop in-group bias: a preference for our own group over other groups. This in-group bias can result in prejudice and discrimination because the out-group is perceived as different and is less preferred than our in-group.



These children are very young, but they are already aware of their gender in-group and out-group.
(credit: modification of work by Simone Ramella)

Despite the group dynamics that seem only to push groups toward conflict, there are forces that promote reconciliation between groups: the expression of empathy, of acknowledgment of past suffering on both sides, and the halt of destructive behaviors.

One function of prejudice is to help us feel good about ourselves and maintain a positive self-concept. This need to feel good about ourselves extends to our in-groups: We want to feel good and protect our in-groups. We seek to resolve threats individually and at the in-group level. This often happens by blaming an out-group for the problem. Scapegoating is the act of blaming an out-group when the in-group experiences frustration or is blocked from obtaining a goal (Allport, 1954).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=748#h5p-212>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=748#h5p-213>

Critical Thinking Questions

Some people seem more willing to openly display prejudice regarding sexual orientation than prejudice regarding race and gender. Speculate on why this might be.

In the United States, many people believe that sexual orientation is a choice, and there is some debate in the research literature as to the extent sexual orientation is biological or influenced by social factors. Because race and gender are not chosen, many Americans believe it is unfair to negatively judge women or racial minority groups for a characteristic that is determined by genetics. In addition, many people in the United States practice religions that believe homosexuality is wrong.

When people blame a scapegoat, how do you think they choose evidence to support the blame?

One way in which they might do this is to selectively attend to information that would bolster their argument. Furthermore, they may actively seek out information to confirm their assertions.

Personal Application Questions

1. Give an example when you felt that someone was prejudiced against you. What do you think caused this attitude? Did this person display any discrimination behaviors and, if so, how?
2. Give an example when you felt prejudiced against someone else. How did you discriminate against them? Why do you think you did this?

Summary

As diverse individuals, humans can experience conflict when interacting with people who are different from each other. Prejudice, or negative feelings and evaluations, is common when people are from a different social group (i.e., out-group). Negative attitudes toward out-groups can lead to discrimination. Prejudice and discrimination against others can be based on gender, race, ethnicity, social class, sexual orientation, or a variety of other social identities. In-group's who feel threatened may blame the out-groups for their plight, thus using the out-group as a scapegoat for their frustration.

63.

AGGRESSION

Learning Objectives

By the end of this section, you will be able to:

- Define aggression
- Define cyberbullying
- Describe the bystander effect

Throughout this chapter we have discussed how people interact and influence one another's thoughts, feelings, and behaviors in both positive and negative ways. People can work together to achieve great things, such as helping each other in emergencies: recall the heroism displayed during the 9/11 terrorist attacks. People also can do great harm to one another, such as conforming to group norms that are immoral and obeying authority to the point of murder: consider the mass conformity of Nazis during WWII. In this section we will discuss a negative side of human behavior—aggression.

Aggression

Humans engage in aggression when they seek to cause harm or pain to another person. Aggression takes two forms depending on one's motives: hostile or instrumental. Hostile aggression is motivated by feelings of anger with intent to cause pain; a fight in a bar with a stranger is an example of hostile aggression. In contrast, instrumental aggression is motivated by achieving a goal and does not necessarily involve intent to cause pain (Berkowitz, 1993); a contract killer who murders for hire displays instrumental aggression.

There are many different theories as to why aggression exists. Some researchers argue that aggression serves an evolutionary function (Buss, 2004). Men are more likely than women to show aggression (Wilson & Daly, 1985). From the perspective of evolutionary psychology, human male aggression, like that in nonhuman

primates, likely serves to display dominance over other males, both to protect a mate and to perpetuate the male's genes. Sexual jealousy is part of male aggression; males endeavor to make sure their mates are not copulating with other males, thus ensuring their own paternity of the female's offspring. Although aggression provides an obvious evolutionary advantage for men, women also engage in aggression. Women typically display instrumental forms of aggression, with their aggression serving as a means to an end (Dodge & Schwartz, 1997). For example, women may express their aggression covertly, for example, by communication that impairs the social standing of another person. Another theory that explains one of the functions of human aggression is frustration aggression theory (Dollard, Doob, Miller, Mowrer, & Sears, 1939). This theory states that when humans are prevented from achieving an important goal, they become frustrated and aggressive.



Human males and nonhuman male primates endeavor to gain and display dominance over other males, as demonstrated in the behavior of these monkeys. (credit: "Arcadius"/Flickr)

Bullying

A modern form of aggression is bullying. As you learn in your study of child development, socializing and playing with other children is beneficial for children's psychological development. However, as you may have experienced as a child, not all play behavior has positive outcomes. Some children are aggressive and want to play roughly. Other children are selfish and do not want to share toys. One form of negative social interactions among children that has become a national concern is bullying. Bullying is repeated negative treatment of another person, often an adolescent, over time (Olweus, 1993). A one-time incident in which one child hits another child on the playground would not be considered bullying: Bullying is repeated behavior. The negative treatment typical in bullying is the attempt to inflict harm, injury, or humiliation, and bullying can include physical or verbal attacks. However, bullying doesn't have to be physical or verbal, it can be psychological. Research finds gender differences in how girls and boys bully others (American Psychological Association, 2010; Olweus, 1993). Boys tend to engage in direct, physical aggression such as physically harming others. Girls tend to engage in indirect, social forms of aggression such as spreading rumors, ignoring, or socially isolating

others. Based on what you have learned about child development and social roles, why do you think boys and girls display different types of bullying behavior?

Bullying involves three parties: the bully, the victim, and witnesses or bystanders. The act of bullying involves an imbalance of power with the bully holding more power—physically, emotionally, and/or socially over the victim. The experience of bullying can be positive for the bully, who may enjoy a boost to self-esteem. However, there are several negative consequences of bullying for the victim, and for the bystanders. How do you think bullying negatively impacts adolescents? Being the victim of bullying is associated with decreased mental health, including experiencing anxiety and depression (APA, 2010). Victims of bullying may underperform in schoolwork (Bowen, 2011). Bullying also can result in the victim committing suicide (APA, 2010). How might bullying negatively affect witnesses?

Although there is not one single personality profile for who becomes a bully and who becomes a victim of bullying (APA, 2010), researchers have identified some patterns in children who are at a greater risk of being bullied (Olweus, 1993):

- Children who are emotionally reactive are at a greater risk for being bullied. Bullies may be attracted to children who get upset easily because the bully can quickly get an emotional reaction from them.
- Children who are different from others are likely to be targeted for bullying. Children who are overweight, cognitively impaired, or racially or ethnically different from their peer group may be at higher risk.
- Gay, lesbian, bisexual, and transgender teens are at very high risk of being bullied and hurt due to their sexual orientation.

Cyberbullying

With the rapid growth of technology, and widely available mobile technology and social networking media, a new form of bullying has emerged: cyberbullying (Hoff & Mitchell, 2009). Cyberbullying, like bullying, is repeated behavior that is intended to cause psychological or emotional harm to another person. What is unique about cyberbullying is that it is typically covert, concealed, done in private, and the bully can remain anonymous. This anonymity gives the bully power, and the victim may feel helpless, unable to escape the harassment, and unable to retaliate (Spears, Slee, Owens, & Johnson, 2009).

Cyberbullying can take many forms, including harassing a victim by spreading rumors, creating a website defaming the victim, and ignoring, insulting, laughing at, or teasing the victim (Spears et al., 2009). In cyberbullying, it is more common for girls to be the bullies and victims because cyberbullying is nonphysical and is a less direct form of bullying (Hoff & Mitchell, 2009). Interestingly, girls who become cyberbullies often have been the victims of cyberbullying at one time (Vandebosch & Van Cleemput, 2009). The effects of cyberbullying are just as harmful as traditional bullying and include the victim feeling frustration, anger, sadness, helplessness, powerlessness, and fear. Victims will also experience lower self-esteem (Hoff & Mitchell,

2009; Spears et al., 2009). Furthermore, recent research suggests that both cyberbullying victims and perpetrators are more likely to experience suicidal ideation, and they are more likely to attempt suicide than individuals who have no experience with cyberbullying (Hinduja & Patchin, 2010). What features of technology make cyberbullying easier and perhaps more accessible to young adults? What can parents, teachers, and social networking websites, like Facebook, do to prevent cyberbullying?



Because cyberbullying is not physical in nature, cyberbullies and their victims are most often female; however, there is much evidence that male homosexuals are frequently victims of cyberbullying as well (Hinduja & Patchin, 2011). (credit: Steven Depolo)

The Bystander Effect

The discussion of bullying highlights the problem of witnesses not intervening to help a victim. This is a common occurrence, as the following well-publicized event demonstrates. In 1964, in Queens, New York, a 19-year-old woman named Kitty Genovese was attacked by a person with a knife near the back entrance to her apartment building and again in the hallway inside her apartment building. When the attack occurred, she screamed for help numerous times and eventually died from her stab wounds. This story became famous because reportedly numerous residents in the apartment building heard her cries for help and did nothing—neither helping her nor summoning the police—though these facts have been disputed.

Based on this case, researchers Latané and Darley (1968) described a phenomenon called the bystander effect. The bystander effect is a phenomenon in which a witness or bystander does not volunteer to help a victim or person in distress. Instead, they just watch what is happening. Social psychologists hold that we make these decisions based on the social situation, not our own personality variables. Why do you think the bystanders didn't help Genovese? What are the benefits to helping her? What are the risks? It is very likely you listed more costs than benefits to helping. In this situation, bystanders likely feared for their own lives—if they went to her aid the attacker might harm them. However, how difficult would it have been to make a

phone call to the police from the safety of their apartments? Why do you think no one helped in any way? Social psychologists claim that diffusion of responsibility is the likely explanation. Diffusion of responsibility is the tendency for no one in a group to help because the responsibility to help is spread throughout the group (Bandura, 1999). Because there were many witnesses to the attack on Genovese, as evidenced by the number of lit apartment windows in the building, individuals assumed someone else must have already called the police. The responsibility to call the police was diffused across the number of witnesses to the crime. Have you ever passed an accident on the freeway and assumed that a victim or certainly another motorist has already reported the accident? In general, the greater the number of bystanders, the less likely any one person will help.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=750#h5p-215>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=750#h5p-216>

Critical Thinking Questions

Compare and contrast hostile and instrumental aggression.

Hostile aggression is intentional with the purpose to inflict pain. Hostile aggression is often motivated by anger. In contrast, instrumental aggression is not motivated by anger or the intention to cause pain. Instrumental aggression serves as a means to reach a goal. In a sense it is a more practical or functional form of aggression, whereas hostile aggression is more emotion-driven and less functional and rational.

What evidence discussed in the previous section suggests that cyberbullying is difficult to detect and prevent?

Cyberbullying is difficult to prevent because there are so many forms of media that adolescents use and are exposed to. The Internet is virtually everywhere: computers, phones, tablets, TVs, gaming systems, and so on. Parents likely do not monitor all of their children's use of the Internet, thus their children could be exposed to cyberbullying without their knowledge.

Cyberbullying is difficult to detect because it can be done anonymously. Cyberbullies can use pseudonyms and can attack victims in untraceable ways, such as hacking into Facebook accounts or making Twitter posts on their behalf.

Personal Application Questions

Have you ever experienced or witnessed bullying or cyberbullying? How did it make you feel? What did you do about it? After reading this section would you have done anything differently?

The next time you see someone needing help, observe your surroundings. Look to see if the bystander effect is in action and take measures to make sure the person gets help. If you aren't able to help, notify an adult or authority figure that can.

Summary

Aggression is seeking to cause another person harm or pain. Hostile aggression is motivated by feelings of anger with intent to cause pain, and instrumental aggression is motivated by achieving a goal and does not

necessarily involve intent to cause pain. Bullying is an international public health concern that largely affects the adolescent population. Bullying is repeated behaviors that are intended to inflict harm on the victim and can take the form of physical, psychological, emotional, or social abuse. Bullying has negative mental health consequences for youth including suicide. Cyberbullying is a newer form of bullying that takes place in an online environment where bullies can remain anonymous and victims are helpless to address the harassment. Despite the social norm of helping others in need, when there are many bystanders witnessing an emergency, diffusion of responsibility will lead to a lower likelihood of any one person helping.

64.

PROSOCIAL BEHAVIOR

Learning Objectives

By the end of this section, you will be able to:

- Describe altruism
- Describe conditions that influence the formation of relationships
- Identify what attracts people to each other
- Describe the triangular theory of love
- Explain social exchange theory in relationships

You've learned about many of the negative behaviors of social psychology, but the field also studies many positive social interactions and behaviors. What makes people like each other? With whom are we friends? Whom do we date? Researchers have documented several features of the situation that influence whether we form relationships with others. There are also universal traits that humans find attractive in others. In this section we discuss conditions that make forming relationships more likely, what we look for in friendships and romantic relationships, the different types of love, and a theory explaining how our relationships are formed, maintained, and terminated.

Prosocial Behavior and Altruism

Do you voluntarily help others? Voluntary behavior with the intent to help other people is called prosocial behavior. Why do people help other people? Is personal benefit such as feeling good about oneself the only reason people help one another? Research suggests there are many other reasons. Altruism is people's desire to help others even if the costs outweigh the benefits of helping. In fact, people acting in altruistic ways may disregard the personal costs associated with helping. For example, news accounts of the 9/11 terrorist attacks

on the World Trade Center in New York reported an employee in the first tower helped his co-workers make it to the exit stairwell. After helping a co-worker to safety, he went back in the burning building to help additional co-workers. In this case the costs of helping were great, and the hero lost his life in the destruction (Stewart, 2002).



The events of 9/11 unleashed an enormous show of altruism and heroism on the parts of first responders and many ordinary people. (credit: Don Halasy)

Some researchers suggest that altruism operates on empathy. Empathy is the capacity to understand another person's perspective, to feel what he or she feels. An empathetic person makes an emotional connection with others and feels compelled to help (Batson, 1991). Other researchers argue that altruism is a form of selfless helping that is not motivated by benefits or feeling good about oneself. Certainly, after helping, people feel good about themselves, but some researchers argue that this is a consequence of altruism, not a cause. Other researchers argue that helping is always self-serving because our egos are involved, and we receive benefits from helping (Cialdini, Brown, Lewis, Luce, & Neuberg 1997). It is challenging to determine experimentally the true motivation for helping, whether it is largely self-serving (egoism) or selfless (altruism). Thus, a debate on whether pure altruism exists continues.

See this excerpt from the popular TV series [Friends episode](#) for a discussion of the egoism versus altruism debate.

Forming Relationships

What do you think is the single most influential factor in determining with whom you become friends and whom you form romantic relationships? You might be surprised to learn that the answer is simple: the people with whom you have the most contact. This most important factor is proximity. You are more likely to be friends with people you have regular contact with. For example, there are decades of research that shows that you are more likely to become friends with people who live in your dorm, your apartment building, or your immediate neighborhood than with people who live farther away (Festinger, Schachler, & Back, 1950). It is simply easier to form relationships with people you see often because you can get to know them.

Similarity is another factor that influences who we form relationships with. We are more likely to become friends or lovers with someone who is similar to us in background, attitudes, and lifestyle. In fact, there is no evidence that opposites attract. Rather, we are attracted to people who are most like us (McPherson, Smith-Lovin, & Cook, 2001). Why do you think we are attracted to people who are similar to us? Sharing things in common will certainly make it easy to get along with others and form connections. When you and another person share similar music taste, hobbies, food preferences, and so on, deciding what to do with your time together might be easy. Homophily is the tendency for people to form social networks, including friendships, marriage, business relationships, and many other types of relationships, with others who are similar (McPherson et al., 2001).



People tend to be attracted to similar people. Many couples share a cultural background. This can be quite obvious in a ceremony such as a wedding, and more subtle (but no less significant) in the day-to-day workings of a relationship. (credit: modification of work by Shiraz Chanawala)

But, homophily limits our exposure to diversity (McPherson et al., 2001). By forming relationships only with people who are similar to us, we will have homogenous groups and will not be exposed to different points of view. In other words, because we are likely to spend time with those who are most like ourselves, we will have limited exposure to those who are different than ourselves, including people of different races, ethnicities, social-economic status, and life situations.

Once we form relationships with people, we desire reciprocity. Reciprocity is the give and take in relationships. We contribute to relationships, but we expect to receive benefits as well. That is, we want our relationships to be a two-way street. We are more likely to like and engage with people who like us back. Self-disclosure is part of the two-way street. Self-disclosure is the sharing of personal information (Laurenceau, Barrett, & Pietromonaco, 1998). We form more intimate connections with people with whom we disclose important information about ourselves. Indeed, self-disclosure is a characteristic of healthy intimate relationships, as long as the information disclosed is consistent with our own views (Cozby, 1973).

Attraction

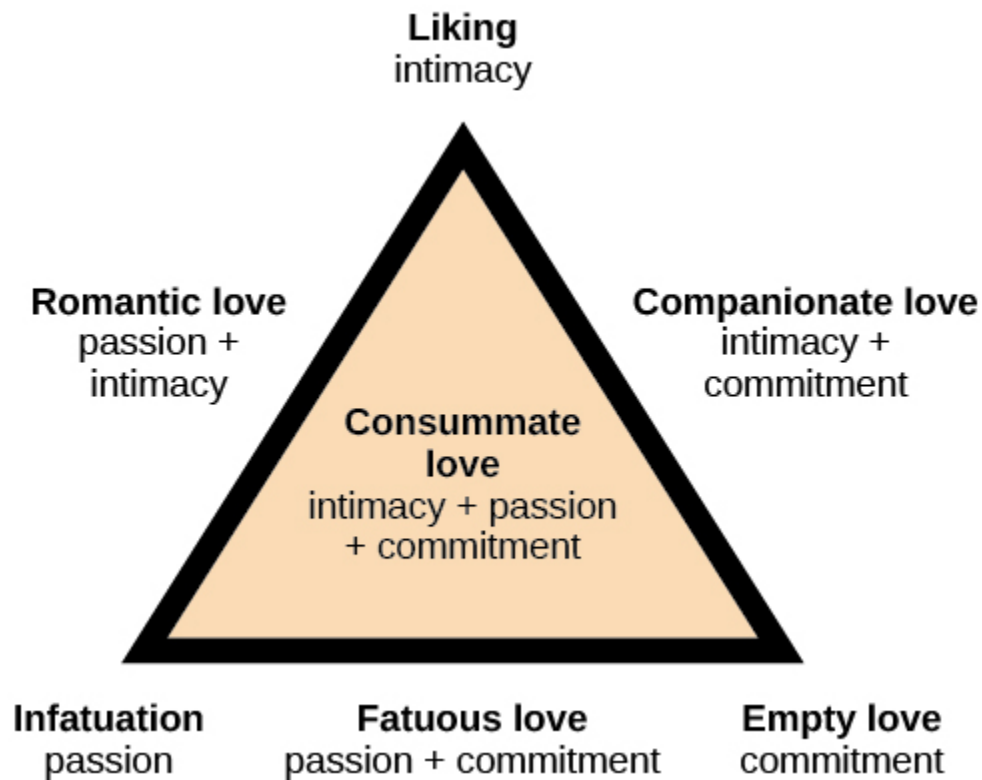
We have discussed how proximity and similarity lead to the formation of relationships, and that reciprocity and self-disclosure are important for relationship maintenance. But what features of a person do we find attractive?

We don't form relationships with everyone that lives or works near us, so how is it that we decide which specific individuals we will select as friends and lovers?

Researchers have documented several characteristics in men and women those humans find attractive. First, we look for friends and lovers who are physically attractive. People differ in what they consider attractive, and attractiveness is culturally influenced. Research, however, suggests that some universally attractive features in women include large eyes, high cheekbones, a narrow jaw line, a slender build (Buss, 1989), and a lower waist-to-hip ratio (Singh, 1993). For men, attractive traits include being tall, having broad shoulders, and a narrow waist (Buss, 1989). Both men and women with high levels of facial and body symmetry are generally considered more attractive than asymmetric individuals (Fink, Neave, Manning, & Grammer, 2006; Penton-Voak et al., 2001; Rikowski & Grammer, 1999). Social traits that people find attractive in potential female mates include warmth, affection, and social skills; in males, the attractive traits include achievement, leadership qualities, and job skills (Regan & Berscheid, 1997). Although humans want mates who are physically attractive, this does not mean that we look for the most attractive person possible. In fact, this observation has led some to propose what is known as the matching hypothesis which asserts that people tend to pick someone they view as their equal in physical attractiveness and social desirability (Taylor, Fiore, Mendelsohn, & Cheshire, 2011). For example, you and most people you know likely would say that a very attractive movie star is out of your league. So, even if you had proximity to that person, you likely would not ask them out on a date because you believe you likely would be rejected. People weigh a potential partner's attractiveness against the likelihood of success with that person. If you think you are particularly unattractive (even if you are not), you likely will seek partners that are unattractive (that is, unattractive in physical appearance or in behavior).

Sternberg's Triangular Theory of Love

We typically love the people with whom we form relationships, but the type of love we have for our family, friends, and lovers differs. Robert Sternberg (1986) proposed that there are three components of love: intimacy, passion, and commitment. These three components form a triangle that defines multiple types of love: this is known as Sternberg's triangular theory of love. Intimacy is the sharing of details and intimate thoughts and emotions. Passion is the physical attraction—the flame in the fire. Commitment is standing by the person—the “in sickness and health” part of the relationship.



According to Sternberg's triangular theory of love, seven types of love can be described from combinations of three components: intimacy, passion, and commitment. (credit: modification of work by "Lnesa"/Wikimedia Commons)

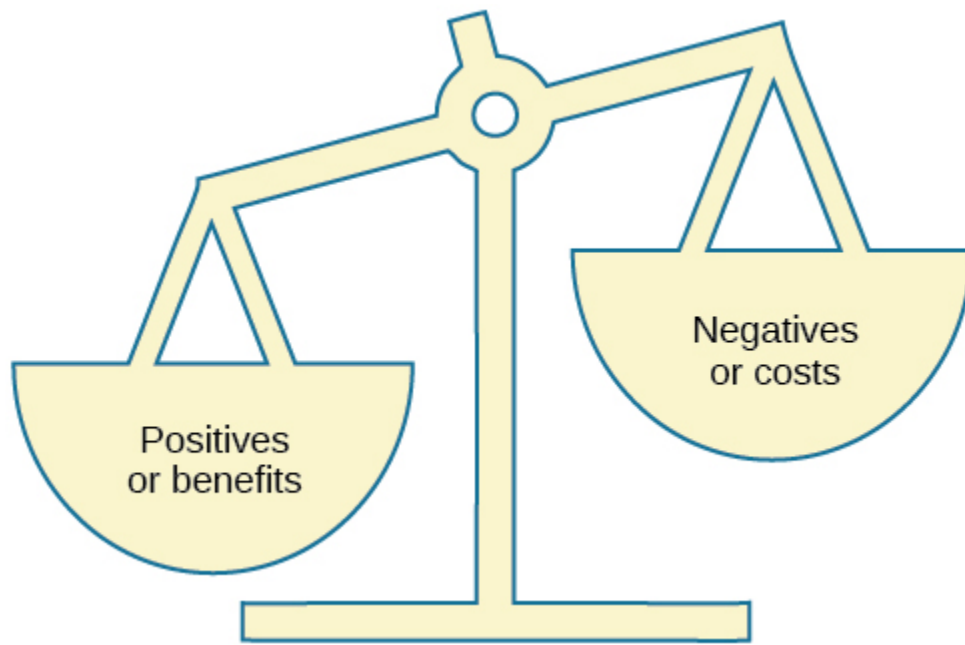
Sternberg (1986) states that a healthy relationship will have all three components of love—intimacy, passion, and commitment—which is described as consummate love. However, different aspects of love might be more prevalent at different life stages. Other forms of love include liking, which is defined as having intimacy but no passion or commitment. Infatuation is the presence of passion without intimacy or commitment. Empty love is having commitment without intimacy or passion. Companionate love, which is characteristic of close friendships and family relationships, consists of intimacy and commitment but no passion. Romantic love is defined by having passion and intimacy, but no commitment. Finally, fatuous love is defined by having passion and commitment, but no intimacy, such as a long-term sexual love affair. Can you describe other examples of relationships that fit these different types of love?



According to Sternberg, consummate love describes a healthy relationship containing intimacy, passion, and commitment. (credit: Kerry Ceszyk)

Social Exchange Theory

We have discussed why we form relationships, what attracts us to others, and different types of love. But what determines whether we are satisfied with and stay in a relationship? One theory that provides an explanation is social exchange theory. According to social exchange theory, we act as naïve economists in keeping a tally of the ratio of costs and benefits of forming and maintaining a relationship with others (Rusbult & Van Lange, 2003).



Acting like naïve economists, people may keep track of the costs and benefits of maintaining a relationship. Typically, only those relationships in which the benefits outweigh the costs will be maintained.

People are motivated to maximize the benefits of social exchanges, or relationships, and minimize the costs. People prefer to have more benefits than costs, or to have nearly equal costs and benefits, but most people are dissatisfied if their social exchanges create more costs than benefits. Let's discuss an example. If you have ever decided to commit to a romantic relationship, you probably considered the advantages and disadvantages of your decision. What are the benefits of being in a committed romantic relationship? You may have considered having companionship, intimacy, and passion, but also being comfortable with a person you know well. What are the costs of being in a committed romantic relationship? You may think that over time boredom from being with only one person may set in; moreover, it may be expensive to share activities such as attending movies and going to dinner. However, the benefits of dating your romantic partner presumably outweigh the costs, or you wouldn't continue the relationship.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=752#h5p-218>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=752#h5p-219>

Critical Thinking Questions

Describe what influences whether relationships will be formed.

Proximity is a major situational factor in relationship formation; people who have frequent contact are more likely to form relationships. Whether or not individuals will form a relationship is based on non-situational factors such as similarity, reciprocity, self-disclosure, and physical

attractiveness. In relationships, people seek reciprocity (i.e., a give and take in costs and benefits), self-disclosure of intimate information, and physically attractive partners.

The evolutionary theory argues that humans are motivated to perpetuate their genes and reproduce. Using an evolutionary perspective, describe traits in men and women that humans find attractive.

Traits that promote reproduction in females are warmth, affection, and social skills; women with these traits are presumably better able to care for children. Traits that are desired in males include achievement, leadership qualities, and job skills; men with these traits are thought to be better able to financially provide for their families.

Personal Application Questions

1. Think about your recent friendships and romantic relationship(s). What factors do you think influenced the development of these relationships? What attracted you to becoming friends or romantic partners?
2. Have you ever used a social exchange theory approach to determine how satisfied you were in a relationship, either a friendship or romantic relationship? Have you ever had the costs outweigh the benefits of a relationship? If so, how did you address this imbalance?

Summary

Altruism is a pure form of helping others out of empathy, which can be contrasted with egoistic motivations for helping. Forming relationships with others is a necessity for social beings. We typically form relationships with people who are close to us in proximity and people with whom we share similarities. We expect reciprocity and self-disclosure in our relationships. We also want to form relationships with people who are physically attractive, though standards for attractiveness vary by culture and gender. There are many types of love that are determined by various combinations of intimacy, passion, and commitment; consummate love, which is the ideal form of love, contains all three components. When determining satisfaction and whether to maintain a relationship, individuals often use a social exchange approach and weigh the costs and benefits of forming and maintaining a relationship.

65.

SOCIAL COGNITION: MAKING SENSE OF OURSELVES AND OTHERS

Learning Objectives

By the end of this section, you will be able to:

- Review the principles of social cognition, including the fundamentals of how we form judgments about other people.
- Define the concept of attitude and review the ways that attitudes are developed and changed, and how attitudes relate to behavior.

One important aspect of social cognition involves forming impressions of other people. Making these judgments quickly and accurately helps us guide our behavior to interact appropriately with the people we know. If we can figure out why our roommate is angry at us, we can react to resolve the problem; if we can determine how to motivate the people in our group to work harder on a project, then the project might be better.

PERCEIVING OTHERS

Our initial judgments of others are based in large part on what we see. The physical features of other people,

particularly their sex, race, age, and physical attractiveness, are very salient, and we often focus our attention on these dimensions (Schneider, 2003; Zebrowitz & Montepare, 2006).

Although it may seem inappropriate or shallow to admit it, we are strongly influenced by the physical attractiveness of others, and many cases physical attractiveness is the most important determinant of our initial liking for other people (Walster, Aronson, Abrahams, & Rottmann, 1966). Infants who are only a year old prefer to look at faces that adults consider to be attractive than at unattractive faces (Langlois, Ritter, Roggman, & Vaughn, 1991). Evolutionary psychologists have argued that our belief that “what is beautiful is also good” may be because we use attractiveness as a cue for health; people whom we find more attractive may also, evolutionarily, have been healthier (Zebrowitz, Fellous, Mignault, & Andreoletti, 2003).



Can you read a book by its cover? Which of these people do you think is more fun and friendly? Who is smarter or more competent? Do you think your judgments are accurate?
J.K. Califf – -19 – CC BY-SA 2.0;
Sascha Kohlmann – Man, Tram – CC BY-SA 2.0; DFID –
Sadia, a teacher in Abbottabad, Pakistan – CC BY-SA 2.0; Ben Raynal – Stranger #61 – CC BY-NC 2.0.

One indicator of health is youth. Leslie Zebrowitz and her colleagues (Zebrowitz, 1996; Zebrowitz, Luevano, Bronstad, & Aharon, 2009) have extensively studied the tendency for both men and women to prefer people whose faces have characteristics similar to those of babies. These features include large, round, and widely spaced eyes, a small nose and chin, prominent cheekbones, and a large forehead. People who have baby faces (both men and women) are seen as more attractive than people who are not baby-faced.



People with baby faces are perceived as attractive.
 johanferreira15 – zac efron in 2008 – CC BY 2.0; friskytuna – Rachel Bilson – CC BY 2.0.

Another indicator of health is symmetry. People are more attracted to faces that are more symmetrical than they are to those that are less symmetrical, and this may be due in part to the perception that symmetrical faces are perceived as healthier (Rhodes et al., 2001).

Although you might think that we would prefer faces that are unusual or unique, in fact the opposite is true. Langlois and Roggman (1990) showed college students the faces of men and women. The faces were composites made up of the average of 2, 4, 8, 16, or 32 faces. The researchers found that the more faces that were averaged into the stimulus, the more attractive it was judged. Again, our liking for average faces may be because they appear healthier.

Although preferences for youthful, symmetrical, and average faces have been observed cross-culturally, and thus appear to be common human preferences, different cultures may also have unique beliefs about what is attractive. In modern Western cultures, “thin is in,” and people prefer those who have little excess fat (Crandall, Merman, & Hebl, 2009). The need to be thin to be attractive is particularly strong for women in contemporary society, and the desire to maintain a low body weight can lead to low self-esteem, eating disorders, and other unhealthy behaviors. However, the norm of thinness has not always been in place; the preference for women with slender, masculine, and athletic looks has become stronger over the past 50 years. In contrast to the relatively universal preferences for youth, symmetry, and averageness, other cultures do not show such a strong propensity for thinness (Sugiyama, 2005).

FORMING JUDGMENTS ON THE BASIS OF APPEARANCE: STEREOTYPING, PREJUDICE,

AND DISCRIMINATION

We frequently use people's appearances to form our judgments about them and to determine our responses to them. The *tendency to attribute personality characteristics to people on the basis of their external appearance or their social group memberships* is known as stereotyping. Our stereotypes about physically attractive people lead us to see them as more dominant, sexually warm, mentally healthy, intelligent, and socially skilled than we perceive physically unattractive people (Langlois et al., 2000). And our stereotypes lead us to treat people differently—the physically attractive are given better grades on essay exams, are more successful on job interviews, and receive lighter sentences in court judgments than their less attractive counterparts (Hosoda, Stone-Romero, & Coats, 2003; Zebrowitz & McDonald, 1991).

In addition to stereotypes about physical attractiveness, we also regularly stereotype people on the basis of their sex, race, age, religion, and many other characteristics, and these stereotypes are frequently negative (Schneider, 2004). Stereotyping is unfair to the people we judge because stereotypes are based on our preconceptions and negative emotions about the members of the group. Stereotyping is closely related to prejudice, *the tendency to dislike people because of their appearance or group memberships*, and discrimination, *negative behaviors toward others based on prejudice*. Stereotyping, prejudice, and discrimination work together. We may not vote for a gay person for public office because of our negative stereotypes about gays, and we may avoid people from other religions or those with mental illness because of our prejudices.

Some stereotypes may be accurate in part. Research has found, for instance, that attractive people are actually more sociable, more popular, and less lonely than less attractive individuals (Langlois et al., 2000). And, consistent with the stereotype that women are “emotional,” women are, on average, more empathic and attuned to the emotions of others than are men (Hall & Schmid Mast, 2008). Group differences in personality traits may occur in part because people act toward others on the basis of their stereotypes, creating a *self-fulfilling prophecy*. A self-fulfilling prophecy occurs *when our expectations about the personality characteristics of others lead us to behave toward those others in ways that make those beliefs come true*. If I have a stereotype that attractive people are friendly, then I may act in a friendly way toward people who are attractive. This friendly behavior may be reciprocated by the attractive person, and if many other people also engage in the same positive behaviors with the person, in the long run he or she may actually become friendlier.

But even if attractive people are on average friendlier than unattractive people, not all attractive people are friendlier than all unattractive people. And even if women are, on average, more emotional than men, not all men are less emotional than all women. Social psychologists believe that it is better to treat people as individuals rather than rely on our stereotypes and prejudices, because stereotyping and prejudice are always unfair and often inaccurate (Fiske, 1989; Stangor, 1995). Furthermore, many of our stereotypes and prejudices occur out of our awareness, such that we do not even know that we are using them.

IMPLICIT ASSOCIATION TEST

You might want to test your own stereotypes and prejudices by completing the [Implicit Association Test](#), a measure of unconscious stereotyping.

We use our stereotypes and prejudices in part because they are easy; if we can quickly size up people on the basis of their physical appearance, that can save us a lot of time and effort. We may be evolutionarily disposed to stereotyping. Because our primitive ancestors needed to accurately separate members of their own kin group from those of others, categorizing people into “us” (the *ingroup*) and “them” (the *outgroup*) was useful and even necessary (Neuberg, Kenrick, & Schaller, 2010). And *the positive emotions that we experience as a result of our group memberships*—known as social identity—can be an important and positive part of our everyday experiences (Hogg, 2003). We may gain social identity as members of our university, our sports teams, our religious and racial groups, and many other groups.

But the fact that we *may* use our stereotypes does not mean that we *should* use them. Stereotypes, prejudice, and discrimination, whether they are consciously or unconsciously applied, make it difficult for some people to effectively contribute to society and may create both mental and physical health problems for them (Swim & Stangor, 1998). In some cases getting beyond our prejudices is required by law, as detailed in the U.S. Civil Rights Act of 1964, the Equal Opportunity Employment Act of 1972, and the Fair Housing Act of 1978.

There are individual differences in prejudice, such that some people are more likely to try to control and confront their stereotypes and prejudices whereas others apply them more freely (Czopp, Monteith, & Mark, 2006; Plant & Devine, 1998). For instance, some people believe in group hierarchies—that some groups are naturally better than others—whereas other people are more egalitarian and hold fewer prejudices (Sidanius & Pratto, 1999; Stangor & Leary, 2006).

Social psychologists believe that we should work to get past our prejudices. The tendency to hold stereotypes and prejudices and to act on them can be reduced, for instance, through positive interactions and friendships with members of other groups, through practice in avoiding using them, and through education (Hewstone, 1996).

RESEARCH FOCUS: FORMING JUDGMENTS OF PEOPLE IN SECONDS

Research has demonstrated that people can draw very accurate conclusions about others on the basis of very limited data. Ambady and Rosenthal (1993) made videotapes of six female and seven male graduate students while they were teaching an undergraduate course. The courses covered diverse areas of the college curriculum, including humanities, social sciences, and natural sciences. For each teacher, three 10-second video clips were taken: 10 seconds from the first 10 minutes of the class, 10 seconds from the middle of the class, and 10 seconds from the last 10 minutes of the class.

The researchers then asked nine female undergraduates to rate the clips of the teachers on 15 dimensions including *optimistic*, *confident*, *active*, *enthusiastic*, *dominant*, *likable*, *warm*, *competent*, and *supportive*. Ambady and her colleagues then compared the ratings of the participants who had seen the teacher for only 30 seconds with the ratings of the same instructors that had been made by students who had spent a whole semester with the teacher, and who had rated her at the end of the semester on scales such as “Rate the quality of the section overall” and “Rate section leader’s performance overall.” As you can see in [Table 14.1 “Accurate Perceptions in 30 Seconds”](#), the ratings of the participants and the ratings of the students were highly positively correlated.

TABLE 14.1 ACCURATE PERCEPTIONS IN 30 SECONDS

Variable	Pearson Correlation Coefficient (r)
Accepting	0.50
Active	0.77
Attentive	0.48
Competent	0.56
Confident	0.82
Dominant	0.79
Empathic	0.45
Enthusiastic	0.76
Honest	0.32
Likable	0.73
(Not) anxious	0.26
Optimistic	0.84
Professional	0.53
Supportive	0.55
Warm	0.67
Overall, across all traits	0.76

This table shows the Pearson correlation coefficients between the impressions that a group of students made after they had seen a video of instructors teaching for only 30 seconds and the teaching ratings of the same instructors made by students who had spent a whole semester in the class. You can see that the correlations are all positive, and that many of them are quite large. The conclusion is that people are sometimes able to draw accurate impressions about other people very quickly.

Source: Ambady, N., & Rosenthal, R. (1993). Half a minute: Predicting teacher evaluations from thin slices of nonverbal behavior and physical attractiveness. *Journal of Personality & Social Psychology*, 64(3), 431–441.

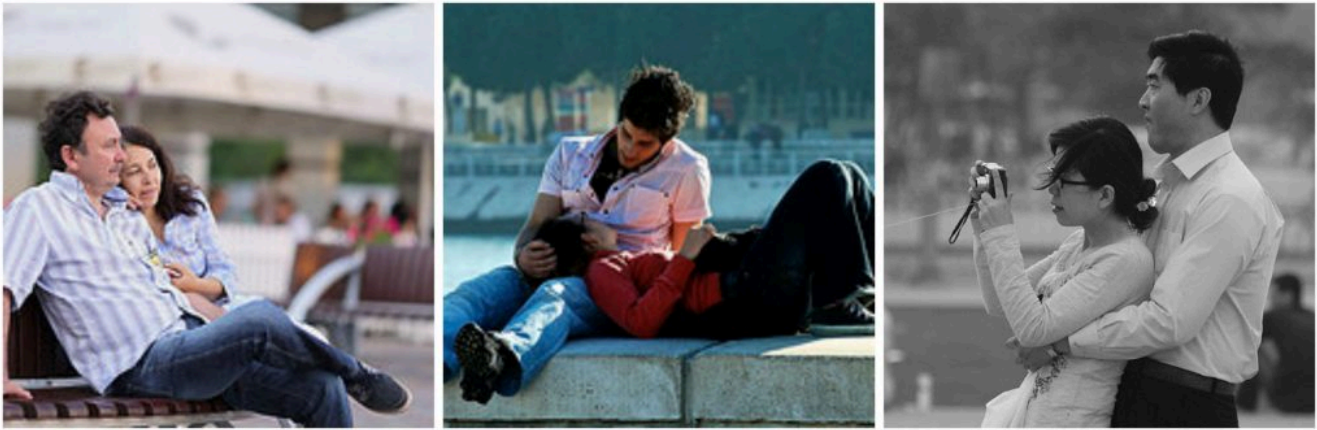
If the finding that judgments made about people in 30 seconds correlate highly with judgments made about the same people after a whole semester surprises you, then perhaps you may be even more surprised to hear that we do not even need that much time. Indeed, Willis and Todorov (2006) found that even a tenth of a second was enough to make judgments that correlated highly with those same judgments made by other people who were given several minutes to make the judgments. Other research has found that we can make accurate judgments, for instance, about our perceptions of salespersons (Ambady, Krabbenhoft, & Hogan, 2006) and about the sexual orientation of

other people (Ambady, Hallahan, & Conner, 1999), in just a few seconds. Todorov, Mandisodza, Goren, and Hall (2005) found that people voted for political candidates in large part on the basis of whether or not their faces, seen only for one second, looked like faces of competent people. Taken together, this research shows that we are well able to form initial impressions of others quickly and often quite accurately.

CLOSE RELATIONSHIPS

One of the most important tasks faced by humans is to develop successful relationships with others. These relationships include acquaintanceships and friendships but also the more important close relationships, which are *the long-term intimate and romantic relationships that we develop with another person—for instance, in a marriage* (Hendrick & Hendrick, 2000). Because most of us will want to enter into a close relationship at some point, and because close relationships are evolutionarily important as they form the basis for effective child rearing, it is useful to know what psychologists have learned about the principles of liking and loving within them.

A major interest of social psychologists is the study of *interpersonal attraction*, or what makes people like, and even love, each other. One important factor is a perceived similarity in values and beliefs between the partners (Davis & Rusbult, 2001). Similarity is important for relationships both because it is more convenient (it's easier if both partners like to ski or go to the movies than if only one does), but also because similarity supports our values—I can feel better about myself and my choice of activities if I see that you also enjoy doing the same things that I do.



Close relationships are characterized by responsiveness, disclosure, intimacy, equity, and passion.

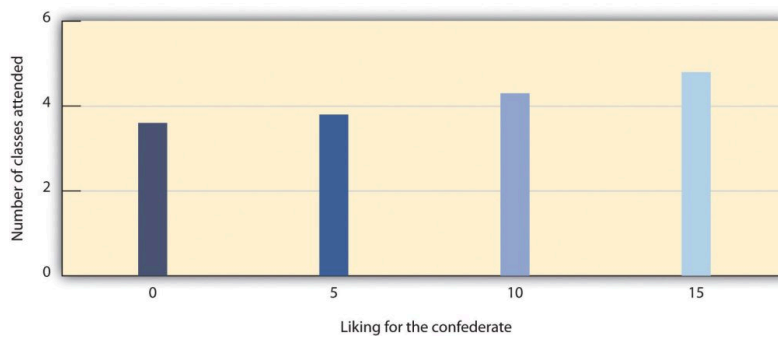
Vladimir Pustovit – Couple – CC BY 2.0; Pedro Ribeiro Simões – Couple in love – CC BY 2.0; Ben – Couple – CC BY 2.0.

Liking is also enhanced by *self-disclosure*, the tendency to communicate frequently, without fear of reprisal, and in an accepting and empathetic manner. Friends are friends because we can talk to them openly about our needs and goals, and because they listen to and respond to our needs (Reis & Aron, 2008). But self-disclosure must be balanced. If I open up to you about the concerns that are important to me, I expect you to do the same in return. If the self-disclosure is not reciprocal, the relationship may not last.

Another important determinant of liking is *proximity*, or the extent to which people are physically near us. Research has found that we are more likely to develop friendships with people who are nearby, for instance, those who live in the same dorm that we do, and even with people who just happen to sit nearer to us in our classes (Back, Schmukle, & Egloff, 2008).

Proximity has its effect on liking through the principle of mere exposure, which is *the tendency to prefer stimuli (including but not limited to people) that we have seen more frequently*. Moreland and Beach (1992) studied mere exposure by having female confederates attend a large lecture class of over 100 students 0, 5, 10, or 15 times during a semester. At the end of the term, the other students in the class were shown pictures of the confederates and asked to indicate both if they recognized them and also how much they liked them. The number of times the confederates had attended class didn't influence the other students' ability to recognize them, but it did influence their liking for them. As predicted by the mere exposure hypothesis, students who had attended class more often were liked more (Figure "Mere Exposure in the Classroom").

Mere Exposure in the Classroom



Richard Moreland and Scott Beach (1992) had female confederates visit classrooms 0, 5, 10, or 15 times over the course of a semester. Then the students rated their liking of the confederates. As predicted by the principles of mere exposure, confederates who had attended class more often were also liked more. Adapted from Moreland, R. L., & Beach, S. R. (1992). Exposure effects in the classroom: The development of affinity among students. *Journal of Experimental Social Psychology*, 28(3), 255–276.

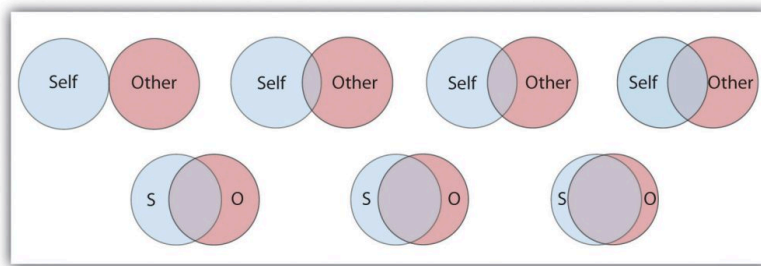
The effect of mere exposure is powerful and occurs in a wide variety of situations. Infants tend to smile at a photograph of someone they have seen before more than they smile at a photograph of someone they are seeing for the first time (Brooks-Gunn & Lewis, 1981), and people prefer side-to-side reversed images of their own faces over their normal (nonreversed) face, whereas their friends prefer their normal face over the reversed one (Mita, Dermer, & Knight, 1977). This is expected on the basis of mere exposure, since people see their own faces primarily in mirrors and thus are exposed to the reversed face more often.

Mere exposure may well have an evolutionary basis. We have an initial fear of the unknown, but as things become more familiar they seem more similar and safe, and thus produce more positive affect and seem less threatening and dangerous (Freitas, Azizian, Travers, & Berry, 2005). In fact, research has found that stimuli tend to produce more positive affect as they become more familiar (Harmon-Jones & Allen, 2001). When the stimuli are people, there may well be an added effect. Familiar people become more likely to be seen as part of the ingroup rather than the outgroup, and this may lead us to like them more. Leslie Zebrowitz and her colleagues found that we like people of our own race in part because they are perceived as similar to us (Zebrowitz, Bornstad, & Lee, 2007).

In the most successful relationships the two people begin to see themselves as a single unit. Arthur Aron

and his colleagues (Aron, Aron, & Smollan, 1992) assessed the role of closeness in relationships using the *Inclusion of Other in the Self Scale* as shown in Figure “The Inclusion of Other in the Self Scale.” You might try completing the measure yourself for some different people that you know—for instance, your family members, friends, spouse, or girlfriend or boyfriend. The measure is simple to use and to interpret; if people see the circles representing the self and the other as more overlapping, this means that the relationship is close. But if they choose the circles that are less overlapping, then the relationship is less so.

The Inclusion of Other in the Self Scale



This scale is used to determine how close two partners feel to each other. The respondent simply circles which of the seven figures he or she feels best characterizes the relationship. Adapted from Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality & Social Psychology*, 63(4), 596–612.

Although the closeness measure is very simple, it has been found to be predictive of people’s satisfaction with their close relationships, and of the tendency for couples to stay together (Aron, Aron, Tudor, & Nelson, 1991; Aron, Paris, & Aron, 1995). When the partners in a relationship feel that they are close, and when they indicate that the relationship is based on caring, warmth, acceptance and social support, we can say that the relationship is *intimate* (Reis & Aron, 2008).

When a couple begins to take care of a household together, has children, and perhaps has to care for elderly parents, the requirements of the relationship become correspondingly bigger. As a result of this complexity, the partners in close relationships increasingly turn to each other for help in coordinating activities, remembering dates and appointments, and accomplishing tasks. Relationships are close in part because the couple becomes highly *interdependent*, relying on each other to meet important goals (Berscheid & Reis, 1998).

In relationships in which a positive rapport between the partners is developed and maintained over a period

of time, the partners are naturally happy with the relationship and they become committed to it. *Commitment* refers to the feelings and actions that keep partners working together to maintain the relationship (Rusbult, Olsen, Davis, Hannon, 2001) and is characterized by mutual expectations that the self and the partner will be responsive to each other's needs (Clark & Mills, 2004). Partners who are committed to the relationship see their mates as more attractive, are less able to imagine themselves with another partner, express less interest in other potential mates, and are less likely to break up (Simpson & Harris, 1994).

People also find relationships more satisfactory, and stay in them longer, when they feel that they are being rewarded by them. When the needs of either or both of the partners are not being met, the relationship is in trouble. This is not to say that people only think about the benefits they are getting; they will also consider the needs of the other. But over the long term, both partners must benefit from the relationship.

Although sexual arousal and excitement are more important early on in relationships, intimacy is also determined by sexual and romantic attraction. Indeed, intimacy is also dependent on *passion*—the partners must display positive affect toward each other. Happy couples are in positive moods when they are around each other; they laugh with each other, express approval rather than criticism of each other's behaviors, and enjoy physical contact. People are happier in their relationships when they view the other person in a positive or even an “idealized” sense, rather than a more realistic and perhaps more negative one (Murray, Holmes, & Griffin, 1996).

Margaret Clark and Edward Lemay (2010) recently reviewed the literature on close relationships and argued that their most important characteristic is a sense of *responsiveness*. People are happy, healthy, and likely to stay in relationships in which they are sure that they can trust the other person to understand, validate, and care for them. It is this unconditional giving and receiving of love that promotes the welfare of both partners and provides the *secure base* that allows both partners to thrive.

CAUSAL ATTRIBUTION: FORMING JUDGMENTS BY OBSERVING BEHAVIOR

When we observe people's behavior we may attempt to determine if the behavior really reflects their underlying personality. If Frank hits Joe, we might wonder if Frank is naturally aggressive or if perhaps Joe had provoked him. If Leslie leaves a big tip for the waitress, we might wonder if she is a generous person or if the service was particularly excellent. *The process of trying to determine the causes of people's behavior, with the goal of learning about their personalities*, is known as causal attribution (Jones et al., 1987).

Making causal attributions is a bit like conducting an experiment. We carefully observe the people we are

interested in and note how they behave in different social situations. After we have made our observations, we draw our conclusions. Sometimes we may decide that the behavior was caused primarily by the person; this is called making a *person attribution*. At other times, we may determine that the behavior was caused primarily by the situation; this is called making a *situation attribution*. And at other times we may decide that the behavior was caused by both the person and the situation.

It is easier to make personal attributions when behavior is more unusual or unexpected. Imagine that you go to a party and you are introduced to Tess. Tess shakes your hand and says, “Nice to meet you!” Can you readily conclude, on the basis of this behavior, that Tess is a friendly person? Probably not. Because the social situation demands that people act in a friendly way (shaking your hand and saying “nice to meet you”), it is difficult to know whether Tess acted friendly because of the situation or because she is really friendly. Imagine, however, that instead of shaking your hand, Tess sticks out her tongue at you and walks away. I think you would agree that it is easier in this case to infer that Tess is unfriendly because her behavior is so contrary to what one would expect (Jones, Davis, & Gergen, 1961).

Although people are reasonably accurate in their attributions (we could say, perhaps, that they are “good enough”; Fiske, 2003), they are far from perfect. One error that we frequently make when making judgments about ourselves is to make *self-serving attributions* by judging the causes of our own behaviors in overly positive ways. If you did well on a test, you will probably attribute that success to person causes (“I’m smart,” “I studied really hard”), but if you do poorly on the test you are more likely to make situation attributions (“The test was hard,” “I had bad luck”). Although making causal attributions is expected to be logical and scientific, our emotions are not irrelevant.

Another way that our attributions are often inaccurate is that we are, by and large, too quick to attribute the behavior of other people to something personal about them rather than to something about their situation. We are more likely to say, “Leslie left a big tip, so she must be generous” than “Leslie left a big tip, but perhaps that was because the service was really excellent.” *The common tendency to overestimate the role of person factors and overlook the impact of situations in judging others* is known as the fundamental attribution error (or correspondence bias).

The fundamental attribution error occurs in part because other people are so salient in our social environments. When I look at you, I see you as my focus, and so I am likely to make personal attributions about you. If the situation is reversed such that people see situations from the perspectives of others, the fundamental attribution error is reduced (Storms, 1973). And when we judge people, we often see them in only one situation. It’s easy for you to think that your math professor is “picky and detail-oriented” because that describes her behavior in class, but you don’t know how she acts with her friends and family, which might be completely different. And we also tend to make person attributions because they are easy. We are more likely to commit the fundamental attribution error—quickly jumping to the conclusion that behavior is caused by underlying personality—when we are tired, distracted, or busy doing other things (Trope & Alfieri, 1997).



The tendency to make person attributions (such as poor people are lazy) for the behaviors of others, even where situational factors such as poor education and growing up in poverty might be better explanations, is caused by the fundamental attribution error.

Franco Folini – Homeless woman with dogs – CC BY-SA 2.0.

An important moral about perceiving others applies here: *We should not be too quick to judge other people*. It is easy to think that poor people are lazy, that people who say something harsh are rude or unfriendly, and that all terrorists are insane madmen. But these attributions may frequently overemphasize the role of the person, resulting in an inappropriate and inaccurate tendency to *blame the victim* (Lerner, 1980; Tennen & Affleck, 1990). Sometimes people are lazy and rude, and some terrorists are probably insane, but these people may also be influenced by the situation in which they find themselves. Poor people may find it more difficult to get work and education because of the environment they grow up in, people may say rude things because they are feeling threatened or are in pain, and terrorists may have learned in their family and school that committing violence in the service of their beliefs is justified. When you find yourself making strong person attributions for the behaviors of others, I hope you will stop and think more carefully. Would you want other people to make person attributions for your behavior in the same situation, or would you prefer that they more fully consider the situation surrounding your behavior? Are you perhaps making the fundamental attribution error?

ATTITUDES AND BEHAVIOR

Attitude refer to *our relatively enduring evaluations of people and things* (Albarracín, Johnson, & Zanna, 2005). We each hold many thousands of attitudes, including those about family and friends, political parties and

political figures, abortion rights, preferences for music, and much more. Some of our attitudes, including those about sports, roller coaster rides, and capital punishment, are heritable, which explains in part why we are similar to our parents on many dimensions (Olson, Vernon, Harris, & Jang, 2001). Other attitudes are learned through direct and indirect experiences with the attitude objects (De Houwer, Thomas, & Baeyens, 2001).

Attitudes are important because they frequently (but not always) predict behavior. If we know that a person has a more positive attitude toward Frosted Flakes than toward Cheerios, then we will naturally predict that she will buy more of the former when she gets to the market. If we know that Charlie is madly in love with Charlene, then we will not be surprised when he proposes marriage. Because attitudes often predict behavior, people who wish to change behavior frequently try to change attitudes through the use of *persuasive communications*. Table “Techniques That Can Be Effective in Persuading Others” presents some of the many techniques that can be used to change people’s attitudes (Cialdini, 2001).

Techniques That Can Be Effective in Persuading Others

Technique	Examples
Choose effective communicators.	Communicators who are attractive, expert, trustworthy, and similar to the listener are most persuasive.
Consider the goals of the listener.	If the listener wants to be entertained, then it is better to use a humorous ad; if the listener is processing the ad more carefully, use a more thoughtful one.
Use humor.	People are more easily persuaded when they are in a good mood.
Use classical conditioning.	Try to associate your product with positive stimuli such as funny jokes or attractive models.
Make use of the listener’s emotions.	Humorous and fear-arousing ads can be effective because they arouse the listener’s emotions.
Use the listener’s behavior to modify his or her attitude.	One approach is the <i>foot-in-the-door technique</i> . First ask for a minor request, and then ask for a larger request after the smaller request has been accepted.

Attitudes predict behavior better for some people than for others. People who are high in self-monitoring—*the tendency to regulate behavior to meet the demands of social situations*—tend to change their behaviors to match the social situation and thus do not always act on their attitudes (Gangestad & Snyder, 2000). High self-monitors agree with statements such as, “In different situations and with different people, I often act like very different persons” and “I guess I put on a show to impress or entertain people.” Attitudes are more likely to predict behavior for low self-monitors, who are more likely to act on their own attitudes even when the social situation suggests that they should behave otherwise. Low self-monitors are more likely to agree with

statements such as “At parties and social gatherings, I do not attempt to do or say things that others will like” and “I can only argue for ideas that I already believe.”

The match between the social situations in which the attitudes are expressed and the behaviors are engaged in also matters, such that there is a greater attitude-behavior correlation when the social situations match. Imagine for a minute the case of Magritte, a 16-year-old high school student. Magritte tells her parents that she hates the idea of smoking cigarettes. But how sure are you that Magritte’s attitude will predict her behavior? Would you be willing to bet that she’d never try smoking when she’s out with her friends?

The problem here is that Magritte’s attitude is being expressed in one social situation (when she is with her parents) whereas the behavior (trying a cigarette) is going to occur in a very different social situation (when she is out with her friends). The relevant social norms are, of course, much different in the two situations. Magritte’s friends might be able to convince her to try smoking, despite her initial negative attitude, by enticing her with peer pressure. Behaviors are more likely to be consistent with attitudes when the social situation in which the behavior occurs is similar to the situation in which the attitude is expressed (Ajzen, 1991).

Although it might not have surprised you to hear that our attitudes predict our behaviors, you might be more surprised to learn that our behaviors also have an influence on our attitudes. It makes sense that if I like Frosted Flakes I’ll buy them, because my positive attitude toward the product influences my behavior. But my attitudes toward Frosted Flakes may also become more positive if I decide—for whatever reason—to buy some. It makes sense that Charlie’s love for Charlene will lead him to propose marriage, but it is also the case that he will likely love Charlene even more after he does so.

Behaviors influence attitudes in part through the process of *self-perception*. Self-perception occurs *when we use our own behavior as a guide to help us determine our own thoughts and feelings* (Bem, 1972; Olson & Stone, 2005). In one demonstration of the power of self-perception, Wells and Petty (1980) assigned their research participants to shake their heads either up and down or side to side as they read newspaper editorials. The participants who had shaken their heads up and down later agreed with the content of the editorials more than the people who had shaken them side to side. Wells and Petty argued that this occurred because the participants used their own head-shaking behaviors to determine their attitudes about the editorials.

Persuaders may use the principles of self-perception to change attitudes. The *foot-in-the-door technique* is a method of persuasion in which the person is first persuaded to accept a rather minor request and then asked for a larger one after that. In one demonstration, Guéguen and Jacob (2002) found that students in a computer discussion group were more likely to volunteer to complete a 40-question survey on their food habits (which required 15 to 20 minutes of their time) if they had already, a few minutes earlier, agreed to help the same requestor with a simple computer-related question (about how to convert a file type) than if they had not first been given the smaller opportunity to help. The idea is that when asked the second time, the people looked at their past behavior (having agreed to the small request) and inferred that they are helpful people.

Behavior also influences our attitudes through a more emotional process known as *cognitive dissonance*. Cognitive dissonance refers to *the discomfort we experience when we choose to behave in ways that we see as inappropriate* (Festinger, 1957; Harmon-Jones & Mills, 1999). If we feel that we have wasted our time or acted

against our own moral principles, we experience negative emotions (dissonance) and may change our attitudes about the behavior to reduce the negative feelings.

Elliot Aronson and Judson Mills (1959) studied whether the cognitive dissonance created by an initiation process could explain how much commitment students felt to a group that they were part of. In their experiment, female college students volunteered to join a group that would be meeting regularly to discuss various aspects of the psychology of sex. According to random assignment, some of the women were told that they would be required to perform an embarrassing procedure (they were asked to read some obscene words and some sexually oriented passages from a novel in public) before they could join the group, whereas other women did not have to go through this initiation. Then all the women got a chance to listen to the group's conversation, which turned out to be very boring.

Aronson and Mills found that the women who had gone through the embarrassing experience subsequently reported more liking for the group than those who had not. They argued that the more effort an individual expends to become a member of the group (e.g., a severe initiation), the more they will become committed to the group, to justify the effort they have put in during the initiation. The idea is that the effort creates dissonant cognitions ("I did all this work to join the group"), which are then justified by creating more consonant ones ("OK, this group is really pretty fun"). Thus the women who spent little effort to get into the group were able to see the group as the dull and boring conversation that it was. The women who went through the more severe initiation, however, succeeded in convincing themselves that the same discussion was a worthwhile experience.

When we put in effort for something—an initiation, a big purchase price, or even some of our precious time—we will likely end up liking the activity more than we would have if the effort had been less; not doing so would lead us to experience the unpleasant feelings of dissonance. After we buy a product, we convince ourselves that we made the right choice because the product is excellent. If we fail to lose the weight we wanted to, we decide that we look good anyway. If we hurt someone else's feelings, we may even decide that he or she is a bad person who deserves our negative behavior. To escape from feeling poorly about themselves, people will engage in quite extraordinary rationalizing. No wonder that most of us believe that "If I had it all to do over again, I would not change anything important."

Summary

Social psychology is the scientific study of how we influence, and are influenced by, the people around us. Social cognition involves forming impressions of ourselves and other people. Doing so quickly and accurately is functional for social life. Our initial judgments of others are based in large part on what we see. The physical features of other people—and particularly their sex, race, age, and physical attractiveness—are very salient, and we often focus our attention on these dimensions. We are attracted to people who appear to be healthy. Indicators of health include youth, symmetry, and averageness. We frequently use people's appearances to form our judgments about them, and to determine our responses to them. These responses include stereotyping, prejudice, and discrimination. Social psychologists believe that people should get past their prejudices and

judge people as individuals. Close relationships are based on intimacy. Intimacy is determined by similarity, self-disclosure, interdependence, commitment, rewards, and passion.

Causal attribution is the process of trying to determine the causes of people's behavior with the goal of learning about their personalities. Although people are reasonably accurate in their attributions, they also succumb to biases such as the fundamental attribution error. Attitudes refer to our relatively enduring evaluations of people and things. Attitudes are determined in part by genetic transmission from our parents and in part through direct and indirect experiences. Although attitudes predict behaviors, behaviors also predict attitudes. This occurs through the processes of self-perception and cognitive dissonance.

EXERCISES AND CRITICAL THINKING

What kinds of people are you attracted to? Do your preferences match the factors that we have just discussed?

What stereotypes and prejudices do you hold? Are you able to get past them and judge people as individuals? Do you think that your stereotypes influence your behavior without your being aware of them?

Consider a time when your behavior influenced your attitudes. Did this occur as a result of self-perception or cognitive dissonance?

66.

INTERACTING WITH OTHERS: HELPING, HURTING, AND CONFORMING

Learning Objectives

By the end of this section, you will be able to:

- Summarize the genetic and environmental factors that contribute to human altruism.
- Provide an overview of the causes of human aggression.
- Explain the situations under which people conform to others and their motivations for doing so.

Humans have developed a variety of social skills that enhance our ability to successfully interact with others. We are often helpful, even when that helping comes at some cost to ourselves, and we often change our opinions and beliefs to fit in with the opinions of those whom we care about. Yet we also are able to be aggressive if we feel the situation warrants it.

HELPING OTHERS: ALTRUISM HELPS CREATE HARMONIOUS RELATIONSHIPS

Altruism refers to *any behavior that is designed to increase another person's welfare, and particularly those actions that do not seem to provide a direct reward to the person who performs them* (Dovidio, Piliavin, Schroeder,

& Penner, 2006). Altruism occurs when we stop to help a stranger who has been stranded on the highway, when we volunteer at a homeless shelter, or when we donate to a charity. According to a survey given by an established coalition that studies and encourages volunteering (<http://www.independentsector.org>), in 2001 over 83 million American adults reported that they helped others by volunteering, and did so an average of 3.6 hours per week. The survey estimated that the value of the volunteer time that was given was over 239 billion dollars.

WHY ARE WE ALTRUISTIC?

Because altruism is costly, you might wonder why we engage in it at all. There are a variety of explanations for the occurrence of altruism, and Table “Some of the Variables Known to Increase Helping” summarizes some of the variables that are known to increase helping.

Some of the Variables Known to Increase Helping

Positive moods	We help more when we are in a good mood (Guéguen & De Gail, 2003).
Similarity	We help people who we see as similar to us, for instance, those who mimic our behaviors (van Baaren, Holland, Kawakami, & van Knippenberg, 2004).
Guilt	If we are experiencing guilt, we may help relieve those negative feelings.
Empathy	We help more when we feel empathy for the other person (Batson, O’Quin, Fultz, Varnderplas, & Isen, 1983).
Benefits	We are more likely to help if we can feel good about ourselves by doing so (Snyder, Omoto, & Lindsay, 2004).
Personal responsibility	We are more likely to help if it is clear that others are not helping.
Self-presentation	We may help in order to show others that we are good people (Hardy & Van Vugt, 2006).

Guéguen, N., & De Gail, M.-A. (2003). The effect of smiling on helping behavior: Smiling and Good Samaritan behavior. *Communication Reports*, 16(2), 133–140; van Baaren, R. B., Holland, R. W., Kawakami, K., & van Knippenberg, A. (2004). Mimicry and prosocial behavior. *Psychological Science*, 15(1), 71–74; Batson, C. D., O’Quin, K., Fultz, J., Varnderplas, M., & Isen, A. M. (1983). Influence of self-reported distress and empathy on egoistic versus altruistic motivation to help. *Journal of Personality and Social Psychology*, 45(3), 706–718; Snyder, M., Omoto, A. M., & Lindsay, J. J. (Eds.). (2004). *Sacrificing time and effort for the good of others: The benefits*

and costs of volunteerism. New York, NY: Guilford Press; Hardy, C. L., & Van Vugt, M. (2006). Nice guys finish first: The competitive altruism hypothesis. *Personality and Social Psychology Bulletin*, 32(10), 1402–1413.

The tendency to help others in need is in part a functional evolutionary adaptation. Although helping others can be costly to us as individuals, helping people who are related to us can perpetuate our own genes (Madsen et al., 2007; McAndrew, 2002; Stewart-Williams, 2007). Burnstein, Crandall, and Kitayama (1994) found that students indicated they would be more likely to help a person who was closely related to them (e.g., a sibling, parent, or child) than they would be to help a person who was more distantly related (e.g., a niece, nephew, uncle, or grandmother). People are more likely to donate kidneys to relatives than to strangers (Borgida, Conner, & Manteufel, 1992), and even children indicate that they are more likely to help their siblings than they are to help a friend (Tisak & Tisak, 1996).



We help
in part to
make
ourselves
feel good,
but also
because
we care
about the
welfare of
others.
Harsha K
R – Friend
In Need –
CC BY-SA
2.0.

Although it makes evolutionary sense that we would help people who we are related to, why would we help people to whom we are not related? One explanation for such behavior is based on the principle of *reciprocal altruism* (Krebs & Davies, 1987; Trivers, 1971). Reciprocal altruism is the principle that, if we help other people now, those others will return the favor should we need their help in the future. By helping others, we both increase our chances of survival and reproductive success and help others increase their survival too. Over the course of evolution, those who engage in reciprocal altruism should be able to reproduce more often than those who do not, thus enabling this kind of altruism to continue.

We also learn to help by modeling the helpful behavior of others. Although people frequently worry about the negative impact of the violence that is seen on TV, there is also a great deal of helping behavior shown on television. Smith et al. (2006) found that 73% of TV shows had some altruism, and that about three altruistic behaviors were shown every hour. Furthermore, the prevalence of altruism was particularly high in children's shows. But just as viewing altruism can increase helping, modeling of behavior that is not altruistic can decrease altruism. For instance, Anderson and Bushman (2001) found that playing violent video games led to a decrease in helping.

We are more likely to help when we receive rewards for doing so and less likely to help when helping is costly. Parents praise their children who share their toys with others, and may reprimand children who are selfish. We are more likely to help when we have plenty of time than when we are in a hurry (Darley and Batson 1973). Another potential reward is the status we gain as a result of helping. When we act altruistically, we gain a reputation as a person with high status who is able and willing to help others, and this status makes us more desirable in the eyes of others (Hardy & Van Vugt, 2006).

The outcome of the reinforcement and modeling of altruism is the development of social norms about helping—standards of behavior that we see as appropriate and desirable regarding helping. The *reciprocity norm* reminds us that we should follow the principles of reciprocal altruism. If someone helps us, then we should help them in the future, and we should help people now with the expectation that they will help us later if we need it. The reciprocity norm is found in everyday adages such as “Scratch my back and I’ll scratch yours” and in religious and philosophical teachings such as the “Golden Rule”: “Do unto other as you would have them do unto you.”

Because helping based on the reciprocity norm is based on the return of earlier help and the expectation of a future return from others, it might not seem like true altruism. We might hope that our children internalize another relevant social norm that seems more altruistic: the *social responsibility norm*. The social responsibility norm tells us that we should try to help others who need assistance, even without any expectation of future paybacks. The teachings of many religions are based on the social responsibility norm; that we should, as good human beings, reach out and help other people whenever we can.

HOW THE PRESENCE OF OTHERS CAN REDUCE HELPING

Late at night on March 13, 1964, 28-year-old Kitty Genovese was murdered within a few yards of her apartment building in New York City after a violent fight with her killer in which she struggled and screamed. When the police interviewed Kitty’s neighbors about the crime, they discovered that 38 of the neighbors indicated that they had seen or heard the fight occurring but not one of them had bothered to intervene, and only one person had called the police.

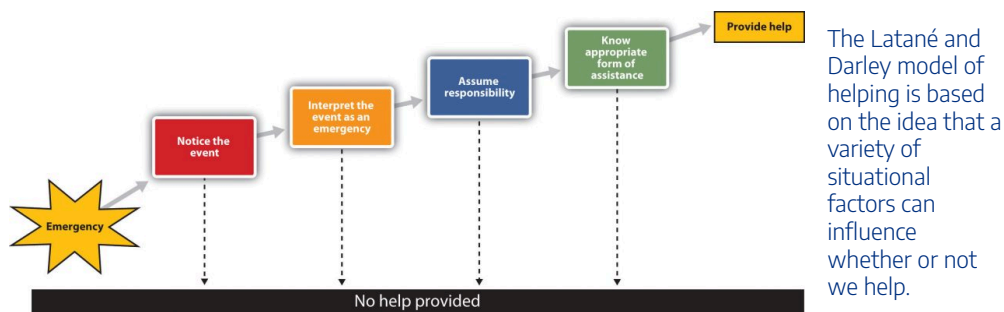
VIDEO CLIP: THE CASE OF KITTY GENOVESE



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=785#oembed-1>

Was Kitty Genovese murdered because there were too many people who heard her cries? Watch this video for an analysis.

Two social psychologists, Bibb Latané and John Darley, were interested in the factors that influenced people to help (or to not help) in such situations (Latané & Darley, 1968). They developed a model (see the figure below) that took into consideration the important role of the social situation in determining helping. The model has been extensively tested in many studies, and there is substantial support for it. Social psychologists have discovered that it was the 38 people themselves that contributed to the tragedy, because people are less likely to notice, interpret, and respond to the needs of others when they are with others than they are when they are alone.



The first step in the model is noticing the event. Latané and Darley (1968) demonstrated the important role of the social situation in noticing by asking research participants to complete a questionnaire in a small room. Some of the participants completed the questionnaire alone, whereas others completed the questionnaire in small groups in which two other participants were also working on questionnaires. A few minutes after the participants had begun the questionnaires, the experimenters started to let some white smoke come into the room through a vent in the wall. The experimenters timed how long it took before the first person in the room looked up and noticed the smoke.

The people who were working alone noticed the smoke in about 5 seconds, and within 4 minutes most of the participants who were working alone had taken some action. On the other hand, on average, the first person in the group conditions did not notice the smoke until over 20 seconds had elapsed. And, although 75%

of the participants who were working alone reported the smoke within 4 minutes, the smoke was reported in only 12% of the groups by that time. In fact, in only 3 of the 8 groups did anyone report the smoke, even after it had filled the room. You can see that the social situation has a powerful influence on noticing; we simply don't see emergencies when other people are with us.

Even if we notice an emergency, we might not interpret it as one. Were the cries of Kitty Genovese really calls for help, or were they simply an argument with a boyfriend? The problem is compounded when others are present, because when we are unsure how to interpret events we normally look to others to help us understand them, and at the same time they are looking to us for information. The problem is that each bystander thinks that other people aren't acting because they don't see an emergency. Believing that the others know something that they don't, each observer concludes that help is not required.

Even if we have noticed the emergency and interpret it as being one, this does not necessarily mean that we will come to the rescue of the other person. We still need to decide that it is our responsibility to do something. The problem is that when we see others around, it is easy to assume that they are going to do something, and that we don't need to do anything ourselves. Diffusion of responsibility occurs *when we assume that others will take action and therefore we do not take action ourselves*. The irony again, of course, is that people are more likely to help when they are the only ones in the situation than when there are others around.

Perhaps you have noticed diffusion of responsibility if you participated in an Internet users group where people asked questions of the other users. Did you find that it was easier to get help if you directed your request to a smaller set of users than when you directed it to a larger number of people? Markey (2000) found that people received help more quickly (in about 37 seconds) when they asked for help by specifying a participant's name than when no name was specified (51 seconds).

The final step in the helping model is knowing how to help. Of course, for many of us the ways to best help another person in an emergency are not that clear; we are not professionals and we have little training in how to help in emergencies. People who do have training in how to act in emergencies are more likely to help, whereas the rest of us just don't know what to do, and therefore we may simply walk by. On the other hand, today many people have cell phones, and we can do a lot with a quick call; in fact, a phone call made in time might have saved Kitty Genovese's life.

HUMAN AGGRESSION: AN ADAPTIVE YET POTENTIALLY DAMAGING BEHAVIOR

Aggression is *behavior that is intended to harm another individual*. Aggression may occur in the heat of the

moment, for instance, when a jealous lover strikes out in rage or the sports fans at a university light fires and destroy cars after an important basketball game. Or it may occur in a more cognitive, deliberate, and planned way, such as the aggression of a bully who steals another child's toys, a terrorist who kills civilians to gain political exposure, or a hired assassin who kills for money.

Not all aggression is physical. Aggression also occurs in nonphysical ways, as when children exclude others from activities, call them names, or spread rumors about them. Paquette and Underwood (1999) found that both boys and girls rated nonphysical aggression such as name-calling as making them feel more “sad and bad” than did physical aggression.

THE ABILITY TO AGGRESS IS PART OF HUMAN NATURE

We may aggress against others in part because it allows us to gain access to valuable resources such as food, territory, and desirable mates, or to protect ourselves from direct attack by others. If aggression helps in the survival of our genes, then the process of natural selection may well have caused humans, as it would any other animal, to be aggressive (Buss & Duntley, 2006).

There is evidence for the genetics of aggression. Aggression is controlled in large part by the amygdala. One of the primary functions of the amygdala is to help us learn to associate stimuli with the rewards and the punishment that they may provide. The amygdala is particularly activated in our responses to stimuli that we see as threatening and fear-arousing. When the amygdala is stimulated, in either humans or in animals, the organism becomes more aggressive.

But just because we *can* aggress does not mean that we *will* aggress. It is not necessarily evolutionarily adaptive to aggress in all situations. Neither people nor animals are always aggressive; they rely on aggression only when they feel that they absolutely need to (Berkowitz, 1993). The prefrontal cortex serves as a control center on aggression; when it is more highly activated, we are more able to control our aggressive impulses. Research has found that the cerebral cortex is less active in murderers and death row inmates, suggesting that violent crime may be caused at least in part by a failure or reduced ability to regulate aggression (Davidson, Putnam, & Larson, 2000).

Hormones are also important in regulating aggression. Most important in this regard is the male sex hormone *testosterone*, which is associated with increased aggression in both males and females. Research conducted on a variety of animals has found a positive correlation between levels of testosterone and

aggression. This relationship seems to be weaker among humans than among animals, yet it is still significant (Dabbs, Hargrove, & Heusel, 1996).

Consuming alcohol increases the likelihood that people will respond aggressively to provocations, and even people who are not normally aggressive may react with aggression when they are intoxicated (Graham, Osgood, Wells, & Stockwell, 2006). Alcohol reduces the ability of people who have consumed it to inhibit their aggression because when people are intoxicated, they become more self-focused and less aware of the social constraints that normally prevent them from engaging aggressively (Bushman & Cooper, 1990; Steele & Southwick, 1985).

NEGATIVE EXPERIENCES INCREASE AGGRESSION

If I were to ask you about the times that you have been aggressive, I bet that you would tell me that many of them occurred when you were angry, in a bad mood, tired, in pain, sick, or frustrated. And you would be right—we are much more likely to aggress when we are experiencing negative emotions. One important determinant of aggression is frustration. When we are frustrated we may lash out at others, even at people who did not cause the frustration. In some cases the aggression is *displaced aggression*, which is aggression that is directed at an object or person other than the person who caused the frustration.

Other negative emotions also increase aggression. Griffit and Veitch (1971) had students complete questionnaires in rooms in which the heat was at a normal temperature or in which the temperature was over 90 degrees Fahrenheit. The students in the latter conditions expressed significantly more hostility. Aggression is greater on hot days than it is on cooler days and during hot years than during cooler years, and most violent riots occur during the hottest days of the year (Bushman, Wang, & Anderson, 2005). Pain also increases aggression (Berkowitz, 1993).

If we are aware that we are feeling negative emotions, we might think that we could release those emotions in a relatively harmless way, such as by punching a pillow or kicking something, with the hopes that doing so will release our aggressive tendencies. *Catharsis*—the idea that observing or engaging in less harmful aggressive actions will reduce the tendency to aggress later in a more harmful way—has been considered by many as a way of decreasing violence, and it was an important part of the theories of Sigmund Freud.

As far as social psychologists have been able to determine, however, catharsis simply does not work. Rather than decreasing aggression, engaging in aggressive behaviors of any type increases the likelihood of later aggression. Bushman, Baumeister, and Stack (1999) first angered their research participants by having another

student insult them. Then half of the participants were allowed to engage in a cathartic behavior: They were given boxing gloves and then got a chance to hit a punching bag for 2 minutes. Then all the participants played a game with the person who had insulted them earlier in which they had a chance to blast the other person with a painful blast of white noise. Contrary to the catharsis hypothesis, the students who had punched the punching bag set a higher noise level and delivered longer bursts of noise than the participants who did not get a chance to hit the punching bag. It seems that if we hit a punching bag, punch a pillow, or scream as loud as we can to release our frustration, the opposite may occur—rather than decreasing aggression, these behaviors in fact increase it.

VIEWING VIOLENT MEDIA INCREASES AGGRESSION

The average American watches over 4 hours of television every day, and these programs contain a substantial amount of aggression. At the same time, children are also exposed to violence in movies and video games, as well as in popular music and music videos that include violent lyrics and imagery. Research evidence makes it very clear that, on average, people who watch violent behavior become more aggressive. The evidence supporting this relationship comes from many studies conducted over many years using both correlational designs as well as laboratory studies in which people have been randomly assigned to view either violent or nonviolent material (Anderson et al., 2003). Viewing violent behavior also increases aggression in part through observational learning. Children who witness violence are more likely to be aggressive. One example is in the studies of Albert Bandura, as shown below.



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=785#oembed-2>

This video shows Professor Albert Bandura describing his studies on the observational learning of aggression in children.

Another outcome of viewing large amounts of violent material is desensitization, which is *the tendency over time to show weaker emotional responses to emotional stimuli*. When we first see violence, we are likely to be

shocked, aroused, and even repulsed by it. However, over time, as we see more and more violence, we become habituated to it, such that the subsequent exposures produce fewer and fewer negative emotional responses. Continually viewing violence also makes us more distrustful and more likely to behave aggressively (Bartholow, Bushman, & Sestir, 2006; Nabi & Sullivan, 2001).

Of course, not everyone who views violent material becomes aggressive; individual differences also matter. People who experience a lot of negative affect and who feel that they are frequently rejected by others whom they care about are more aggressive (Downey, Irwin, Ramsay, & Ayduk, 2004). People with inflated or unstable self-esteem are more prone to anger and are highly aggressive when their high self-image is threatened (Baumeister, Smart, & Boden, 1996). For instance, classroom bullies are those children who always want to be the center of attention, who think a lot of themselves, and who cannot take criticism (Salmivalli & Nieminen, 2002). Bullies are highly motivated to protect their inflated self-concepts, and they react with anger and aggression when it is threatened.

There is a culturally universal tendency for men to be more physically violent than women (Archer & Coyne, 2005; Crick & Nelson, 2002). Worldwide, about 99% of rapes and about 90% of robberies, assaults, and murders are committed by men (Graham & Wells, 2001). These sex differences do not imply that women are never aggressive. Both men and women respond to insults and provocation with aggression; the differences between men and women are smaller after they have been frustrated, insulted, or threatened (Bettencourt & Miller, 1996).

CONFORMITY AND OBEDIENCE: HOW SOCIAL INFLUENCE CREATES SOCIAL NORMS

When we decide on what courses to enroll in by asking for advice from our friends, change our beliefs or behaviors as a result of the ideas that we hear from others, or binge drink because our friends are doing it, we are engaging in conformity, *a change in beliefs or behavior that occurs as the result of the presence of the other people around us*. We conform not only because we believe that other people have accurate information and we want to have knowledge (*informational conformity*) but also because we want to be liked by others (*normative conformity*).

The typical outcome of conformity is that our beliefs and behaviors become more similar to those of others

around us. But some situations create more conformity than others, and some of the factors that contribute to conformity are shown in Table “Variables That Increase Conformity.”

Variables That Increase Conformity

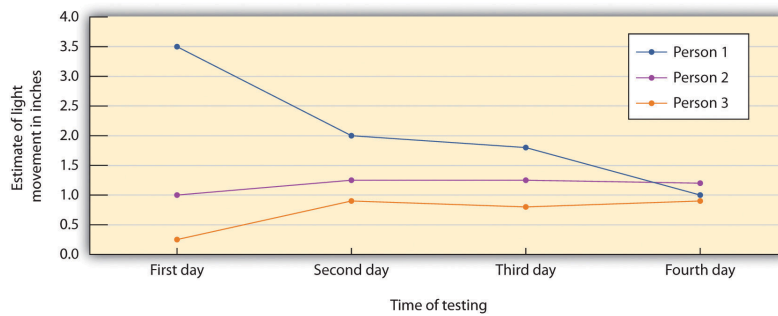
Variable	Description	Example
Number in majority	As the number of people who are engaging in a behavior increases, the tendency to conform to those people also increases.	People are more likely to stop and look up in the air when many, rather than few, people are also looking up (Milgram, Bickman, & Berkowitz, 1969).
Unanimity	Conformity reduces sharply when any one person deviates from the norm.	In Solomon Asch’s line-matching research, when any one person gave a different answer, conformity was eliminated.
Status and authority	People who have higher status, such as those in authority, create more conformity.	Milgram (1974) found that conformity in his obedience studies was greatly reduced when the person giving the command to shock was described as an “ordinary man” rather than a scientist at Yale University.

Milgram, S., Bickman, L., & Berkowitz, L. (1969). Note on the drawing power of crowds of different size. *Journal of Personality and Social Psychology*, 13, 79–82; Milgram, S. (1974). *Obedience to authority: An experimental view*. New York, NY: Harper and Row.

At times conformity occurs in a relatively spontaneous and unconscious way, without any obvious intent of one person to change the other, or an awareness that the conformity is occurring. Robert Cialdini and his colleagues (Cialdini, Reno, & Kallgren, 1990) found that college students were more likely to throw litter on the ground themselves when they had just seen another person throw some paper on the ground, and Cheng and Chartrand (2003) found that people unconsciously mimicked the behaviors of others, such as by rubbing their face or shaking their foot, and that that mimicry was greater when the other person was of high versus low social status.

Muzafer Sherif (1936) studied how norms develop in ambiguous situations. In his studies, college students were placed in a dark room with a single point of light and were asked to indicate, each time the light was turned on, how much it appeared to move. (The movement, which is not actually real, occurs because of the saccadic movement of the eyes.) Each group member gave his or her response on each trial aloud and each time in a different random order. As you can see in Figure “Sherif’s (1936) Studies on Conformity,” Sherif found a conformity effect: Over time, the responses of the group members became more and more similar to each other such that after four days they converged on a common norm. When the participants were interviewed after the study, they indicated that they had not realized that they were conforming.

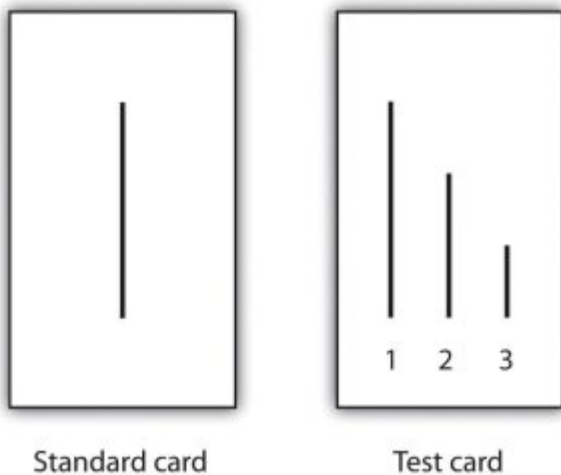
Sherif's (1936) Studies on Conformity



The participants in the studies by Muzafer Sherif initially had different beliefs about the degree to which a point of light appeared to be moving. (You can see these differences as expressed on Day 1.) However, as they shared their beliefs with other group members over several days, a common group norm developed. Shown here are the estimates made by a group of three participants who met together on four different days.

Adapted from Sherif, M. (1936). *The psychology of social norms*. New York, NY: Harper and Row.

Not all conformity is passive. In the research of Solomon Asch (1955) the judgments that group members were asked to make were entirely unambiguous, and the influence of the other people on judgments was apparent. The research participants were male college students who were told that they were to be participating in a test of visual abilities. The men were seated in front of a board that displayed the visual stimuli that they were going to judge. The men were told that there would be 18 trials during the experiment, and on each trial they would see two cards. The standard card had a single line that was to be judged, and the test card had three lines that varied in length between about 2 and 10 inches.



On each trial, each person in the group answered out loud, beginning with one end of the group and moving toward the other end. Although the real research participant did not know it, the other group members were actually not participants but experimental confederates who gave predetermined answers on each trial. Because the real participant was seated next to last in the row, he always made his judgment following most of the other group members. Although on the first two trials the confederates each gave the correct answer, on the third trial, and on 11 of the subsequent trials, they all had been instructed to give the same wrong choice. For instance, even though the correct answer was Line 1, they would all say it was Line 2. Thus when it became the participant's turn to answer, he could either give the clearly correct answer or conform to the incorrect responses of the confederates.

Remarkably, in this study about 76% of the 123 men who were tested gave at least one incorrect response when it was their turn, and 37% of the responses, overall, were conforming. This is indeed evidence for the power of conformity because the participants were making clearly incorrect responses in public. However, conformity was not absolute; in addition to the 24% of the men who never conformed, only 5% of the men conformed on all 12 of the critical trials.

Asch's Line Matching Studies



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=785#oembed-3>

Watch this video to see a demonstration of Asch's line studies.

The tendency to conform to those in authority, known as obedience, was demonstrated in a remarkable set

of studies performed by Stanley Milgram (1974). Milgram designed a study in which he could observe the extent to which a person who presented himself as an authority would be able to produce obedience, even to the extent of leading people to cause harm to others. Like many other researchers who were interested in conformity, Milgram's interest stemmed in part from his desire to understand how the presence of a powerful social situation—in this case the directives of Adolph Hitler, the German dictator who ordered the killing of millions of Jews and other “undesirable” people during World War II—could produce obedience.

Milgram used newspaper ads to recruit men (and in one study, women) from a wide variety of backgrounds to participate in his research. When the research participant arrived at the lab, he or she was introduced to a man who was ostensibly another research participant but who actually was a confederate working with the experimenter as part of the experimental team. The experimenter explained that the goal of the research was to study the effects of punishment on learning. After the participant and the confederate both consented to be in the study, the researcher explained that one of them would be the teacher, and the other the learner. They were each given a slip of paper and asked to open it and indicate what it said. In fact both papers read “teacher,” which allowed the confederate to pretend that he had been assigned to be the learner and thus to assure that the actual participant was always the teacher.

While the research participant (now the teacher) looked on, the learner was taken into the adjoining shock room and strapped to an electrode that was to deliver the punishment. The experimenter explained that the teacher's job would be to sit in the control room and read a list of word pairs to the learner. After the teacher read the list once, it would be the learner's job to remember which words went together. For instance, if the word pair was “blue sofa,” the teacher would say the word “blue” on the testing trials, and the learner would have to indicate which of four possible words (“house,” “sofa,” “cat,” or “carpet”) was the correct answer by pressing one of four buttons in front of him.

After the experimenter gave the “teacher” a mild shock to demonstrate that the shocks really were painful, the experiment began. The research participant first read the list of words to the learner and then began testing him on his learning. The shock apparatus (Figure 14.13 “Materials Used in Milgram's Experiments on Obedience”) was in front of the teacher, and the learner was not visible in the shock room. The experimenter sat behind the teacher and explained to him that each time the learner made a mistake he was to press one of the shock switches to administer the shock. Moreover, the switch that was to be pressed increased by one level with each mistake, so that each mistake required a stronger shock.

Once the learner (who was, of course, actually the experimental confederate) was alone in the shock room, he unstrapped himself from the shock machine and brought out a tape recorder that he used to play a prerecorded series of responses that the teacher could hear through the wall of the room.

The teacher heard the learner say “ugh!” after the first few shocks. After the next few mistakes, when the shock level reached 150 V, the learner was heard to exclaim, “Let me out of here. I have heart trouble!” As the shock reached about 270 V, the protests of the learner became more vehement, and after 300 V the learner proclaimed that he was not going to answer any more questions. From 330 V and up, the learner was silent. At this point the experimenter responded to participants' questions, if any, with a scripted response indicating

that they should continue reading the questions and applying increasing shock when the learner did not respond.

The results of Milgram's research were themselves quite shocking. Although all the participants gave the initial mild levels of shock, responses varied after that. Some refused to continue after about 150 V, despite the insistence of the experimenter to continue to increase the shock level. Still others, however, continued to present the questions and to administer the shocks, under the pressure of the experimenter, who demanded that they continue. In the end, 65% of the participants continued giving the shock to the learner all the way up to the 450 V maximum, even though that shock was marked as "danger: severe shock" and no response had been heard from the participant for several trials. In other words, well over half of the men who participated had, as far as they knew, shocked another person to death, all as part of a supposed experiment on learning.

In case you are thinking that such high levels of obedience would not be observed in today's modern culture, there is fact evidence that they would. Milgram's findings were almost exactly replicated, using men and women from a wide variety of ethnic groups, in a study conducted this decade at Santa Clara University (Burger, 2009). In this replication of the Milgram experiment, 67% of the men and 73% of the women agreed to administer increasingly painful electric shocks when an authority figure ordered them to. The participants in this study were not, however, allowed to go beyond the 150 V shock switch.

Although it might be tempting to conclude that Burger's and Milgram's experiments demonstrate that people are innately bad creatures who are ready to shock others to death, this is not in fact the case. Rather it is the social situation, and not the people themselves, that is responsible for the behavior. When Milgram created variations on his original procedure, he found that changes in the situation dramatically influenced the amount of conformity. Conformity was significantly reduced when people were allowed to choose their own shock level rather than being ordered to use the level required by the experimenter, when the experimenter communicated by phone rather than from within the experimental room, and when other research participants refused to give the shock. These findings are consistent with a basic principle of social psychology: The situation in which people find themselves has a major influence on their behavior.

DO WE ALWAYS CONFORM?

The research that we have discussed to this point suggests that most people conform to the opinions and desires of others. But it is not always the case that we blindly conform. For one, there are individual differences in conformity. People with lower self-esteem are more likely to conform than are those with higher self-esteem, and people who are dependent on and who have a strong need for approval from others are also more conforming (Bornstein, 1993). People who highly identify with or who have a high degree of commitment to a

group are also more likely to conform to group norms than those who care less about the group (Jetten, Spears, & Manstead, 1997). Despite these individual differences among people in terms of their tendency to conform, however, research has generally found that the impact of individual difference variables on conformity is smaller than the influence of situational variables, such as the number and unanimity of the majority.

We have seen that conformity usually occurs such that the opinions and behaviors of individuals become more similar to the opinions and behaviors of the majority of the people in the group. However, and although it is much more unusual, there are cases *in which a smaller number of individuals is able to influence the opinions or behaviors of the larger group*—a phenomenon known as minority influence. Minorities who are consistent and confident in their opinions may in some cases be able to be persuasive (Moscovici, Mugny, & Van Avermaet, 1985).

Persuasion that comes from minorities has another, and potentially even more important, effect on the opinions of majority group members: It can lead majorities to engage in fuller, as well as more divergent, innovative, and creative thinking about the topics being discussed (Martin, Hewstone, Martin, & Gardikiotis, 2008). Nemeth and Kwan (1987) found that participants working together in groups solved problems more creatively when only one person gave a different and unusual response than the other members did (minority influence) in comparison to when three people gave the same unusual response.

It is a good thing that minorities can be influential; otherwise, the world would be pretty boring indeed. When we look back on history, we find that it is the unusual, divergent, innovative minority groups or individuals, who—although frequently ridiculed at the time for their unusual ideas—end up being respected for producing positive changes.

Another case where conformity does not occur is when people feel that their freedom is being threatened by influence attempts, yet they also have the ability to resist that persuasion. In these cases they may develop *a strong emotional reaction that leads people to resist pressures to conform* known as psychological reactance (Miron & Brehm, 2006). Reactance is aroused when our ability to choose which behaviors to engage in is eliminated or threatened with elimination. The outcome of the experience of reactance is that people may not conform at all, in fact moving their opinions or behaviors away from the desires of the influencer. Consider an experiment conducted by Pennebaker and Sanders (1976), who attempted to get people to stop writing graffiti on the walls of campus restrooms. In the first group of restrooms they put a sign that read “Do not write on these walls under any circumstances!” whereas in the second group they placed a sign that simply said “Please don’t write on these walls.” Two weeks later, the researchers returned to the restrooms to see if the signs had made a difference. They found that there was significantly less graffiti in the second group of restrooms than in the first one. It seems as if people who were given strong pressures to not engage in the behavior were more likely to react against those directives than were people who were given a weaker message.

Reactance represents a desire to restore freedom that is being threatened. A child who feels that his or her parents are forcing him to eat his asparagus may react quite vehemently with a strong refusal to touch the plate. And an adult who feels that she is being pressured by a car salesman might feel the same way and leave the showroom entirely, resulting in the opposite of the salesman’s intended outcome.

Summary

Altruism is behavior that is designed to increase another person's welfare, and particularly those actions that do not seem to provide a direct reward to the person who performs them. The tendency to help others in need is in part a functional evolutionary adaptation and in part determined by environmental factors. Although helping others can be costly to us as individuals, helping people who are related to us can perpetuate our own genes. Some helping is based on reciprocal altruism, the principle that if we help other people now, those others will return the favor should we need their help in the future.

We also learn to help through modeling and reinforcement. The result of this learning is norms about helping, including the reciprocity norm and the social responsibility norm. Research testing the Latané and Darley model of helping has shown the importance of the social situation in noticing, interpreting, and acting in emergency situations. Aggression is physical or nonphysical behavior that is intended to harm another individual. Aggression has both genetic and environmental causes. The experience of negative emotions tends to increase aggression.

Viewing violence tends to increase aggression. The social norm that condones and even encourages responding to insults with aggression is known as the culture of honor. Conformity, the change in beliefs or behavior that occurs as the result of the presence of the other people around us, can occur in both active and passive ways. The typical outcome of conformity is that our beliefs and behaviors become more similar to those of others around us. The situation is the most powerful determinant of conformity, but individual differences may also matter. The important influence of the social situation on conformity was demonstrated in the research by Sherif, Asch, Milgram, and others. Minority influence can change attitudes and change how majorities process information.

Exercises and Critical Thinking

1. Consider a time when you were helpful. Was the behavior truly altruistic, or did you help for selfish reasons?
2. Consider a time when you or someone you know was aggressive. What do you think caused the aggression?
3. Should parents limit the amount of violent TV shows and video games that their children are exposed to? Why or why not?
4. Is conformity a "good thing" or a "bad thing" for society? What determines whether it is good or bad?

67.

WORKING WITH OTHERS: THE COSTS AND BENEFITS OF SOCIAL GROUPS

Learning Objectives

By the end of this section, you will be able to:

- Summarize the advantages and disadvantages of working together in groups to perform tasks and make decisions.
- Review the factors that can increase group productivity.

Just as our primitive ancestors lived together in small social groups, including families, tribes, and clans, people today still spend a great deal of time in groups. We study together in study groups, we work together on production lines, and we decide the fates of others in courtroom juries. We work in groups because groups can be beneficial. A rock band that is writing a new song or a surgical team in the middle of a complex operation may coordinate their efforts so well that it is clear that the same outcome could never have occurred if the individuals had worked alone. But group performance will only be better than individual performance to the extent that the group members are motivated to meet the group goals, effectively share information, and efficiently coordinate their efforts. Because these things do not always happen, group performance is almost never as good as we would expect, given the number of individuals in the group, and may even in some cases be inferior to that which could have been made by one or more members of the group working alone.



Working groups are used to perform tasks and make decisions, but are they effective?

Credit: ResoluteSupportMedia – CC BY 2.0; Timothy Vollmer – CopyNight Washington DC at ALA office – CC BY 2.0.

WORKING IN FRONT OF OTHERS: SOCIAL FACILITATION AND SOCIAL INHIBITION

In an early social psychological study, Norman Triplett (1898) found that bicycle racers who were competing with other bicyclers on the same track rode significantly faster than bicyclers who were racing alone, against the clock. This led Triplett to hypothesize that people perform tasks better when there are other people present than they do when they are alone. Subsequent findings validated Triplett's results, and experiments have shown that the presence of others can increase performance on many types of tasks, including jogging, shooting pool, lifting weights, and solving problems (Bond & Titus, 1983). *The tendency to perform tasks better or faster in the presence of others* is known as social facilitation.

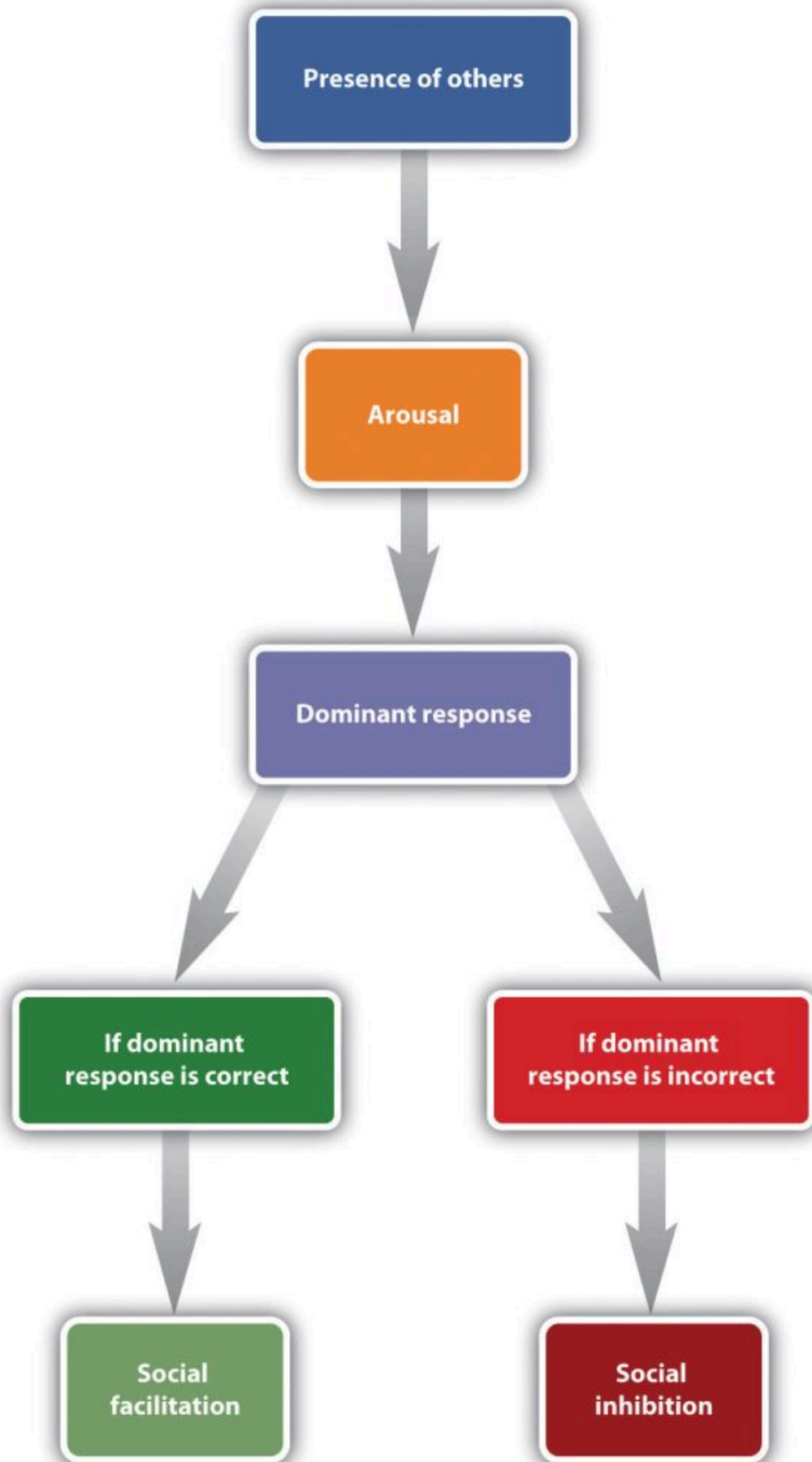
However, although people sometimes perform better when they are in groups than they do alone, the situation is not that simple. Perhaps you remember an experience when you performed a task (playing the piano, shooting basketball free throws, giving a public presentation) very well alone but poorly with, or in front of, others. Thus it seems that the conclusion that being with others increases performance cannot be

entirely true. *The tendency to perform tasks more poorly or more slowly in the presence of others* is known as social inhibition.

Robert Zajonc (1965) explained the observed influence of others on task performance using the concept of physiological arousal. According to Zajonc, when we are with others we experience more arousal than we do when we are alone, and this arousal increases the likelihood that we will perform the *dominant response*, the action that we are most likely to emit in any given situation (Figure “Drive-Arousal Model of Social Facilitation”).

Drive-Arousal Model of Social Facilitation

Robert Zajonc's
Drive-Arousal
Model of Social
Facilitation



The most important aspect of Zajonc's theory was that the experience of arousal and the resulting increase in the occurrence of the dominant response could be used to predict whether the presence of others would produce social facilitation or social inhibition. Zajonc argued that when the task to be performed was relatively easy, or if the individual had learned to perform the task very well (a task such as pedaling a bicycle), the dominant response was likely to be the correct response, and the increase in arousal caused by the presence of others would create social facilitation. On the other hand, when the task was difficult or not well learned (a task such as giving a speech in front of others), the dominant response is likely to be the incorrect one, and thus, because the increase in arousal increases the occurrence of the (incorrect) dominant response, performance is hindered.

A great deal of experimental research has now confirmed these predictions. A meta-analysis by Bond and Titus (1983), which looked at the results of over 200 studies using over 20,000 research participants, found that the presence of others significantly increased the rate of performing on simple tasks, and also decreased both rate and quality of performance on complex tasks.

Although the arousal model proposed by Zajonc is perhaps the most elegant, other explanations have also been proposed to account for social facilitation and social inhibition. One modification argues that we are particularly influenced by others when we perceive that the others are evaluating us or competing with us (Baron, 1986). In one study supporting this idea, Strube, Miles, and Finch (1981) found that the presence of spectators increased joggers' speed only when the spectators were facing the joggers, so that the spectators could see the joggers and assess their performance. The presence of others did not influence joggers' performance when the joggers were facing in the other direction and thus could not see them.

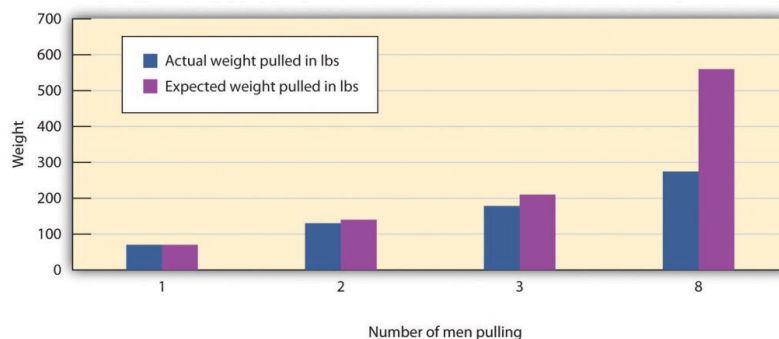
WORKING TOGETHER IN GROUPS

The ability of a group to perform well is determined by the characteristics of the group members (e.g., are they knowledgeable and skilled?) as well as by the *group process*—that is, the events that occur while the group is working on the task. When the outcome of group performance is better than we would expect given the individuals who form the group, we call the outcome a *group process gain*, and when the group outcome is worse than we would have expected given the individuals who form the group, we call the outcome a *group process loss*.

One group process loss that may occur in groups is that the group members may engage in social loafing, a *group process loss that occurs when people do not work as hard in a group as they do when they are working alone*.

In one of the earliest social psychology experiments, Ringelmann (1913; reported in Kravitz & Martin, 1986) had individual men, as well as groups of various numbers of men, pull as hard as they could on ropes while he measured the maximum amount that they were able to pull. As you can see in Figure “Group Process Loss,” although larger groups pulled harder than any one individual, Ringelmann also found a substantial process loss. In fact, the loss was so large that groups of three men pulled at only 85% of their expected capability, whereas groups of eight pulled at only 37% of their expected capability. This type of process loss, in which group productivity decreases as the size of the group increases, has been found to occur on a wide variety of tasks.

Group Process Loss



Ringelmann found that although more men pulled harder on a rope than fewer men did, there was a substantial process loss in comparison to what would have been expected on the basis of their individual performances.

Group process losses can also occur when group members conform to each other rather than expressing their own divergent ideas. Groupthink is a phenomenon that occurs when a group made up of members who may be very competent and thus quite capable of making excellent decisions nevertheless ends up, as a result of a flawed group process and strong conformity pressures, making a poor decision (Baron, 2005; Janis, 2007). Groupthink is more likely to occur in groups whose members feel a strong group identity, when there is a strong and directive leader, and when the group needs to make an important decision quickly. The problem is that groups suffering from groupthink become unwilling to seek out or discuss discrepant or unsettling information about the topic at hand, and the group members do not express contradictory opinions. Because the group members are afraid to express opinions that contradict those of the leader, or to bring in outsiders who have other information, the group is prevented from making a fully informed decision. Figure “Causes and Outcomes of Groupthink” summarizes the basic causes and outcomes of groupthink.

Causes and Outcomes of Groupthink



It has been suggested that groupthink was involved in a number of well-known and important, but very poor, decisions made by government and business groups, including the decision to invade Iraq made by President Bush and his advisors in 2002, the crashes of two Space Shuttle missions in 1986 and 2003, and the decision of President John Kennedy and his advisors to commit U.S. forces to help invade Cuba and overthrow Fidel Castro in 1962. Analyses of the decision-making processes in these cases have documented the role of conformity pressures.

As a result of the high levels of conformity in these groups, the group begins to see itself as extremely valuable and important, highly capable of making high-quality decisions, and invulnerable. The group members begin

to feel that they are superior and do not need to seek outside information. Such a situation is conducive to terrible decision-making and resulting fiascos.

PSYCHOLOGY IN EVERYDAY LIFE: DO JURIES MAKE GOOD DECISIONS?

Although many other countries rely on judges to make judgments in civil and criminal trials, the jury is the foundation of the legal system in the United States. The notion of a “trial by one’s peers” is based on the assumption that average individuals can make informed and fair decisions when they work together in groups. But given the potential for group process losses, are juries really the best way to approach these important decisions?

As a small working group, juries have the potential to produce either good or poor decisions, depending on the outcome of the characteristics of the individual members as well as the group process. In terms of individual group characteristics, people who have already served on juries are more likely to be seen as experts, are more likely to be chosen to be the jury foreman, and give more input during the deliberation. It has also been found that status matters; jury members with higher status occupations and education, males rather than females, and those who talk first are more likely to be chosen as the foreman, and these individuals also contribute more to the jury discussion (Stasser, Kerr, & Bray, 1982).

However, although at least some member characteristics have an influence on jury decision making, group process plays a more important role in the outcome of jury decisions than do member characteristics. Like any group, juries develop their own individual norms, and these norms can have a profound impact on how they reach their decision. Analysis of group process within juries shows that different juries take very different approaches to reaching a verdict. Some spend a lot of time in initial planning, whereas others immediately jump into the deliberation. Some juries base their discussion around a review and reorganization of the evidence, waiting to make a vote until it has all been considered, whereas other juries first determine which decision is preferred in the group by taking a poll and then (if the first vote does not lead to a final verdict) organize their discussion around these opinions. These two approaches are used quite equally but may in some cases lead to different decisions (Davis, Stasson, Ono, & Zimmerman, 1988).

Perhaps most importantly, conformity pressures have a strong impact on jury decision making. As you can see in [Figure 14.18 “Results From Stasser, Kerr, and Bray, 1982”](#), when there are a greater number of jury members who hold the majority position, it becomes more and more certain that their opinion will prevail during the discussion. This does not mean that minorities can never be persuasive, but it is very difficult for them to do so. The strong influence of the majority is probably

due to both informational conformity (i.e., that there are more arguments supporting the favored position) and normative conformity (the people on the majority side have greater social influence).

Figure 14.18 Results From Stasser, Kerr, and Bray, 1982

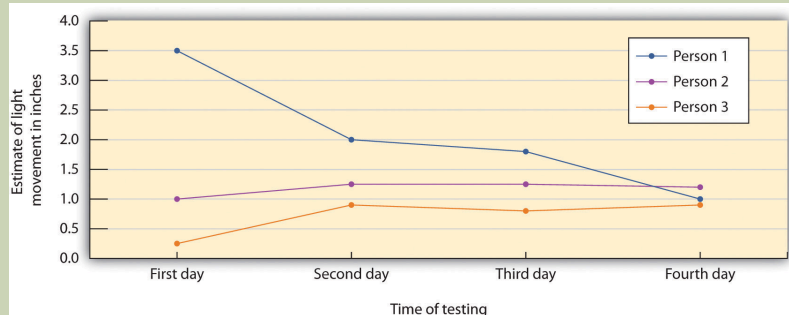


Figure 14.18 Results From Stasser, Kerr, and Bray, 1982. The participants in the studies by Muzafer Sherif initially had different beliefs about the degree to which a point of light appeared to be moving. (You can see these differences as expressed on Day 1.) However, as they shared their beliefs with other group members over several days, a common group norm developed. Shown here are the estimates made by a group of three participants who met together on four different days. Adapted from Sherif, M. (1936). *The psychology of social norms*. New York, NY: Harper and Row.

Given the potential difficulties that groups face in making good decisions, you might be worried that the verdicts rendered by juries may not be particularly effective, accurate, or fair. However, despite these concerns, the evidence suggests that juries may not do as badly as we would expect. The deliberation process seems to cancel out many individual juror biases, and the importance of the decision leads the jury members to carefully consider the evidence itself.

USING GROUPS EFFECTIVELY

Taken together, working in groups has both positive and negative outcomes. On the positive side, it makes sense to use groups to make decisions because people can create outcomes working together that any one individual could not hope to accomplish alone. In addition, once a group makes a decision, the group will normally find it easier to get other people to implement it, because many people feel that decisions made by groups are fairer than are those made by individuals.

Yet groups frequently succumb to process losses, leading them to be less effective than they should be. Furthermore, group members often don't realize that the process losses are occurring around them. For instance, people who participate in brainstorming groups report that they have been more productive than those who work alone, even if the group has actually not done that well (Nijstad, Stroebe, & Lodewijckx, 2006; Stroebe, Diehl, & Abakoumkin, 1992). *The tendency for group members to overvalue the productivity of the groups they work in* is known as the illusion of group productivity, and it seems to occur for several reasons. For one, the productivity of the group as a whole is highly accessible, and this productivity generally seems quite good, at least in comparison to the contributions of single individuals. The group members hear many ideas expressed by themselves and the other group members, and this gives the impression that the group is doing very well, even if objectively it is not. And, on the affective side, group members receive a lot of positive social identity from their group memberships. These positive feelings naturally lead them to believe that the group is strong and performing well.

What we need to do, then, is to recognize both the strengths and limitations of group performance and use whatever techniques we can to increase process gains and reduce process losses. Table “Techniques That Can Be Used to Improve Group Performance” presents some of the techniques that are known to help groups achieve their goals.

Techniques That Can Be Used to Improve Group Performance

Technique	Example
Provide rewards for performance.	Rewarding employees and team members with bonuses will increase their effort toward the group goal. People will also work harder in groups when they feel that they are contributing to the group goal than when they feel that their contributions are not important.
Keep group member contributions identifiable.	Group members will work harder if they feel that their contributions to the group are known and potentially seen positively by the other group members than they will if their contributions are summed into the group total and thus unknown (Szymanski & Harkins, 1987).
Maintain distributive justice (equity).	Workers who feel that their rewards are proportional to their efforts in the group will be happier and work harder than will workers who feel that they are underpaid (Geurts, Buunk, & Schaufeli, 1994).
Keep groups small.	Larger groups are more likely to suffer from coordination problems and social loafing. The most effective working groups are of relatively small size—about four or five members.
Create positive group norms.	Group performance is increased when the group members care about the ability of the group to do a good job (e.g., a cohesive sports or military team). On the other hand, some groups develop norms that prohibit members from working to their full potential and thus encourage loafing.
Improve information sharing.	Leaders must work to be sure that each member of the group is encouraged to present the information that he or she has in group discussions. One approach to increasing full discussion of the issues is to have the group break up into smaller subgroups for discussion.
Allow plenty of time.	Groups take longer to reach consensus, and allowing plenty of time will help keep the group from coming to premature consensus and making an unwise choice. Time to consider the issues fully also allows the group to gain new knowledge by seeking information and analysis from outside experts.
Set specific and attainable goals.	Groups that set specific, difficult, yet attainable goals (e.g., “improve sales by 10% over the next 6 months”) are more effective than groups that are given goals that are not very clear (e.g., “let’s sell as much as we can!”; Locke & Latham, 2006).

Sources: Szymanski, K., & Harkins, S. G. (1987). Social loafing and self-evaluation with a social standard. *Journal of Personality & Social Psychology*, 53(5), 891–897; Geurts, S. A., Buunk, B. P., & Schaufeli, W. B. (1994). Social comparisons and absenteeism: A structural modeling approach. *Journal of Applied Social Psychology*, 24(21), 1871–1890; Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science*, 15(5), 265–268.

Summary

The performance of working groups is almost never as good as we would expect, given the number of individuals in the group, and in some cases may even be inferior to the performance of one or more members

of the group working alone. The tendency to perform tasks better or faster in the presence of others is known as social facilitation. The tendency to perform tasks more poorly or more slowly in the presence of others is known as social inhibition. The ability of a group to perform well is determined by the characteristics of the group members as well as by the events that occur in the group itself—the group process.

One group process loss that may occur in groups is that the group members may engage in social loafing. Group process losses can also occur as a result of groupthink, when group members conform to each other rather than expressing their own divergent ideas. Taken together, working in groups has both positive and negative outcomes. It is important to recognize both the strengths and limitations of group performance and use whatever techniques we can to increase process gains and reduce process losses.

Exercise and Critical Thinking

Consider a time when you worked together with others in a group. Do you think the group experienced group process gains or group process losses? If the latter, what might you do now in a group to encourage effective group performance?

68.

REFERENCES

- Adams, H. E., Wright, L. W., Jr., & Lohr, B.A. (1996). Is homophobia associated with homosexual arousal? *Journal of Abnormal Psychology, 105*, 440–445.
- Albarracín, D., & Wyer, R. S. (2001). Elaborative and nonelaborative processing of a behavior-related communication. *Personality and Social Psychology Bulletin, 27*, 691–705.
- Alexander, M. (2001, August 22). Thirty years later, Stanford prison experiment lives on. *Stanford Report*. Retrieved from <http://news.stanford.edu/news/2001/august22/prison2-822.html>.
- Allport, G. W. (1954). *The Nature of Human Prejudice*. Cambridge, MA: Addison-Wesley.
- American Psychological Association (2010). Bullying: What parents, teachers can do to stop it. Retrieved from <http://www.apa.org/news/press/releases/2010/04/bullying.aspx>.
- Aronson, E., & Mills, J. (1959). The effect of severity of initiation on liking for a group, *Journal of Abnormal and Social Psychology, 59*, 177–181.
- Asch, S. E. (1955). Opinions and social pressure. *Scientific American, 193*, 31–35.
- Baron, R. M., Albright, L., & Malloy, T. E. (1995). Effects of behavioral and social class information on social judgment. *Personality and Social Psychology Bulletin, 21*, 308–315.
- Batson, C. D. (1991). *The altruism question: Toward a social-psychological answer*. Hillsdale, NJ: Erlbaum.
- Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Personality and Social Psychology Review, 3*(3), 193–209. doi:10.1207/s15327957pspr0303_3.
- Berkowitz, A. D. (2004). *The social norms approach: Theory, research and annotated bibliography*. Retrieved from http://www.alanberkowitz.com/articles/social_norms.pdf.
- Berkowitz, L. (1993). *Aggression: Its causes, consequences, and control*. New York, NY: McGraw-Hill.
- Betz, N. E. (2008). Women's career development. In F. Denmark & M. Paludi (Eds.), *Psychology of women: Handbook of issues and theories* (2nd ed., pp. 717–752). Westport, CT: Praeger.
- Blau, F. D., Ferber, M. A., & Winkler, A. E. (2010). *The economics of women, men, and work* (6th ed.). Upper Saddle River, NJ: Prentice Hall.
- Bond, C. F., & Titus, L. J. (1983). Social facilitation: A meta-analysis of 241 studies. *Psychological Bulletin, 94*, 265–292.
- Bond, R., & Smith, P. B. (1996). Culture and conformity: A meta-analysis of studies using Asch's (1952b, 1956) line judgment task. *Psychological Bulletin, 119*(1), 111–137.
- Bowen, L. (2011). Bullying may contribute to lower test scores. *Monitor on Psychology, 42*(9), 19.
- Brown, P., & Minty, J. (2006, December 1). Media coverage and charitable giving after the 2004 tsunami.

- Series Report 855. William Davidson Institute, University of Michigan. Retrieved from <http://www.wdi.umich.edu/files/Publications/WorkingPapers/wp855.pdf>.
- Brown, R. (2010). *Prejudice: Its social psychology* (2nd ed.). Malden, MA: Wiley-Blackwell.
- Buss, D. M. (2004). *Evolutionary psychology: The new science of the mind* (2nd ed.). Boston, MA: Allyn and Bacon.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1–49.
- Ceci, S. J., & Williams, W. M. (2011). Understanding current causes of women's underrepresentation in science. *Proceedings of the National Academy of Sciences*, 108, 3157–3162.
- Choi, I., & Nisbett R. E. (1998). Situational salience and cultural differences in the correspondence bias and actor-observer bias. *Personality and Social Psychology Bulletin*, 24(9), 949–960. doi:10.1177/0146167298249003.
- Cialdini, R. B. (2001). Harnessing the science of persuasion. *Harvard Business Review*, 79, 72–81.
- Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy-altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology*, 73, 481–494.
- Colin Powell regrets Iraq war intelligence. (2011). Retrieved March 23, 2014, from <http://www.aljazeera.com/news/americas/2011/09/20119116916873488.html>.
- Cozby, P. C. (1973). Self-disclosure: A literature review. *Psychological Bulletin*, 79, 73–91.
- Crisp, R. J., & Turner, R. N. (2009). Can imagined interactions produce positive perceptions? Reducing prejudice through simulated social contact. *American Psychologist*, 64, 231–240.
- Crowley, A. E., & Hoyer, W. D. (1994). An integrative framework for understanding two-sided persuasion. *Journal of Consumer Research*, 20(4), 561–574.
- Croyle, R. T., & Cooper, J. (1983). Dissonance arousal: Physiological evidence. *Journal of Personality and Social Psychology*, 45, 782–791.
- Cuddy, A. J., Norton, M. I., & Fiske, S. T. (2005). This old stereotype: The pervasiveness and persistence of the elderly stereotype. *Journal of Social Issues*, 61, 267–285.
- Deutsch, M., & Gerard, H. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology*, 51, 629–636.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56, 5–18.
- Devine, P. G., & Elliot, A. J. (1995). Are racial stereotypes really fading? The Princeton trilogy revisited. *Personality and Social Psychology Bulletin*, 21, 1139–1150.
- Dixon, T. L., & Linz D. (2000). Overrepresentation and underrepresentation of African Americans and Latinos as lawbreakers on television news. *Journal of Communication*, 50(2), 131–154.
- Dodge, K. A., & Schwartz, D. (1997). Social information processing mechanisms in aggressive behavior. In

D. M. Stoff and J. Breiling (Eds.), *Handbook of Antisocial Behavior* (pp. 171–180). Hoboken, NJ: John Wiley and Sons.

Dollard, J., Miller, N. E., Doob, L. W., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.

Dovidio, J. F., & Gaertner, S. L. (2004). On the nature of contemporary prejudice. In P. S. Rothenberg, (Ed.), *Race, class, and gender in the United States: An integrated study* (6th ed., pp. 132–142). New York, NY: Worth.

Dovidio, J. F., Gluszek, A., John, M. S., Dittmann, R., & Lagunes, P. (2010). Understanding bias toward Latinos: Discrimination, dimensions of difference, and experience of exclusion. *Journal of Social Issues*, 66, 59–78.

Eagly, A. H., & Chaiken, S. (1975). An attribution analysis of the effect of communicator characteristics on opinion change: The case of communicator attractiveness. *Journal of Personality and Social Psychology*, 32, 136–144.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Orlando, FL: Harcourt Brace Jovanovich College.

East Haven mayor suggests “he might have tacos” to repair relations with Latinos. (2012). Retrieved April 27, 2014, from <https://www.youtube.com/watch?v=PCUwtfqF4wU>.

Ehrlinger, J., Gilovich, T., & Ross, L. (2005). Peering into the bias blind spot: People’s assessments of bias in themselves and others. *Personality and Social Psychology Bulletin*, 31, 680–692.

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Festinger, L., & Maccoby, N. (1964). On resistance to persuasive communications. *The Journal of Abnormal and Social Psychology*, 68, 359–366.

Festinger, L., Schachler, S., & Back, K. W. (1950). *Social pressures in informal groups: A study of human factors in housing*. New York, NY: Harper.

Fink, B., Neave, N., Manning, J. T., & Grammer, K. (2006). Facial symmetry and judgments of attractiveness, health and personality. *Personality and Individual Differences*, 41, 491–499.

Fiske, S. T., Cuddy, A. J., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82(6), 878–902.

Fiske, S. T., Gilbert, D. T., & Lindzey, G. (2010). *Handbook of social psychology* (5th ed.). Hoboken, NJ: Wiley.

Freedman, J. L., & Fraser, S. C. (1966). Compliance without pressure: The foot-in-the-door technique. *Journal of Personality and Social Psychology*, 4, 195–202.

Geen, R. G. (1989). Alternative conceptions of social facilitation. In P. B. Paulus (Ed.), *Psychology of group influence* (2nd ed., pp. 15–51). Hillsdale, NJ: Lawrence Erlbaum.

Greenberg, J., Schimel, J., & Martens, A. (2002). Ageism: Denying the face of the future. In T. D. Nelson (Ed.), *Ageism: Stereotyping and prejudice against older persons* (pp. 27–48). Cambridge, MA: MIT Press.

- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, 74, 1464–1480.
- Greenwald, A. G., & Ronis, D. L. (1978). Twenty years of cognitive dissonance: Case study of the evolution of a theory. *Psychological Review*, 85, 53–57.
- Grove, J. R., Hanrahan, S. J., & McInman, A. (1991). Success/failure bias in attributions across involvement categories in sport. *Personality and Social Psychology Bulletin*, 17(1), 93–97.
- Gupta, P. B., & Lord, K. R. (1998). Product placement in movies: The effect of prominence and mode on recall. *Journal of Current Issues and Research in Advertising*, 20, 47–59.
- Hare, A. P. (2003). Roles, relationships, and groups in organizations: Some conclusions and recommendations. *Small Group Research*, 34, 123–154.
- Haugtvedt, C. P., & Wegener, D. T. (1994). Message order effects in persuasion: An attitude strength perspective. *Journal of Consumer Research*, 21, 205–218.
- Hebl, M. R., Foster, J. B., Mannix, L. M., & Dovidio, J. F. (2002). Formal and interpersonal discrimination: A field study of bias toward homosexual applicants. *Personality and Social Psychology Bulletin*, 28(6), 815–825.
- Heckert, T. M., Latier, A., Ringwald-Burton, A., & Drazen, C. (2006). Relations among student effort, perceived class difficulty appropriateness, and student evaluations of teaching: Is it possible to “buy” better evaluations through lenient grading? *College Student Journal*, 40(3), 588.
- Herek, G. M., & McLemore, K. A. (2013). Sexual prejudice. *Annual Review of Psychology*, 64, 309–33. doi:10.1146/annurev-psych-113011-143826.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Hinduja, S., & Patchin, J. W. (2010). Bullying, cyberbullying, and suicide. *Archives of Suicide Research*, 14(3), 206–221.
- Hinduja, S. & Patchin, J. W. (2011). Cyberbullying research summary: Bullying, cyberbullying, and sexual orientation. Cyberbullying Research Center. Retrieved April 27, 2014, from http://www.cyberbullying.us/cyberbullying_sexual_orientation_fact_sheet.pdf.
- Hodge, S. R., Burden, J. W., Jr., Robinson, L. E., & Bennett, R. A., III. (2008). Theorizing on the stereotyping of black male student-athletes. *Journal for the Study of Sports and Athletes in Education*, 2, 203–226.
- Hoff, D. L., & Mitchell, S. N. (2009). Cyberbullying: Causes, effects, and remedies. *Journal of Education*, 47, 652–665.
- Hovland, C. I., Janis, I. L. and Kelley, H. H. (1953). *Communications and persuasion: Psychological studies in opinion change*. New Haven, CT: Yale University Press.
- Hovland, C.I., Weiss, W. (1951, Winter). The influence of source credibility on communication effectiveness. *Public Opinion Quarterly*, 15(4), 635–650.
- Igou, E. R., & Bless, H. (2003). Inferring the importance of arguments: Order effects and conversational rules. *Journal of Experimental Social Psychology*, 39, 91–99.

- Ito, T. A., & Urland, G. R., (2003). Race and gender on the brain: Electro cortical measures of attention to race and gender of multiply categorizable individuals. *Journal of Personality & Social Psychology*, 85, 616–626.
- Jackson, J. M., & Williams, K. D. (1985). Social loafing on difficult tasks: Working collectively can improve performance. *Journal of Personality and Social Psychology*, 49, 937–942.
- Janis, I. L. (1972). *Victims of groupthink*. Boston, MA: Houghton Mifflin.
- Jones, E. E., & Nisbett, R. E. (1971). *The actor and the observer: Divergent perceptions of the causes of behavior*. New York: General Learning Press.
- Jost, J. T., Banaji, M. R., & Nosek, B. A. (2004). A decade of system justification theory: Accumulated evidence of conscious and unconscious bolstering of the status quo. *Political Psychology*, 25, 881–919.
- Jost, J. T., & Major, B. (Eds.). (2001). *The psychology of legitimacy: Emerging perspectives on ideology, justice, and intergroup relations*. New York, NY: Cambridge University Press.
- Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology*, 65, 681–706.
- Krosnick, J. A., & Alwin, D. F. (1989). Aging and susceptibility to attitude change. *Journal of Personality and Social Psychology*, 57, 416–425.
- Kumkale, G. T., & Albarracín, D. (2004). The sleeper effect in persuasion: A meta-analytic review. *Psychological Bulletin*, 130(1), 143–172. doi:10.1037/0033-2909.130.1.143.
- Larsen, K. S. (1990). The Asch conformity experiment: Replication and transhistorical comparisons. *Journal of Social Behavior & Personality*, 5(4), 163–168.
- Latané, B., & Darley, J. M. (1968). Group inhibition of bystander intervention in emergencies. *Journal of Personality and Social Psychology*, 10, 215–221.
- Latané, B., Williams, K. and Harkins, S. G. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology*, 37, 822–832.
- Laurenceau, J.-P., Barrett, L. F., & Pietromonaco, P. R. (1998). Intimacy as an interpersonal process: The importance of self-disclosure, partner disclosure, and perceived partner responsiveness in interpersonal exchanges. *Journal of Personality and Social Psychology*, 74(5), 1238–1251. doi:10.1037/0022-3514.74.5.1238.
- Lerner, M. J., & Miller, D. T. (1978). Just world research and the attribution process: Looking back and ahead. *Psychological Bulletin*, 85, 1030–1051.
- Lumsdaine, A. A., & Janis, I. L. (1953). Resistance to “counterpropaganda” produced by one-sided and two-sided “propaganda” presentations. *Public Opinion Quarterly*, 17, 311–318.
- Malle, B. F. (2006). The actor–observer asymmetry in attribution: A (surprising) meta-analysis [Supplemental material]. *Psychological Bulletin*, 132(6), 895–919. doi:10.1037/0033-2909.132.6.895.
- Malloy, T. E., Albright, L., Kenny, D. A., Agatstein, F., & Winkquist, L. (1997). Interpersonal perception and metaperception in non-overlapping social groups. *Journal of Personality and Social Psychology*, 72, 390–398.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224–253.

- Martin, C. H., & Bull, P. (2008). Obedience and conformity in clinical practice. *British Journal of Midwifery*, 16(8), 504–509.
- McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 27, pp. 415–444. doi:10.1146/annurev.soc.27.1.415.
- Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, 67, 371–378.
- Milgram, S. (1965). Some conditions of obedience and disobedience to authority. *Human Relations*, 18, 57–76.
- Miller, D. T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin*, 82, 213–225.
- Miller, N., & Campbell, D. T. (1959). Recency and primacy in persuasion as a function of the timing of speeches and measurements. *The Journal of Abnormal and Social Psychology*, 59, 1–9.
- Mischel, W. (1977). The interaction of person and situation. *Personality at the crossroads: Current issues in interactional psychology*, 333, 352.
- Mitchell, D. H., & Eckstein, D. (2009). Jury dynamics and decision-making: A prescription for groupthink. *International Journal of Academic Research*, 1(1), 163–169.
- Nelson, T. (Ed.). (2004). *Ageism: Stereotyping and prejudice against older persons*. Cambridge, MA: The MIT Press.
- Nisbett, R. E., Caputo, C., Legant, P., & Marecek, J. (1973). Behavior as seen by the actor and as seen by the observer. *Journal of Personality and Social Psychology*, 27, 154–164.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, 108, 291–310.
- Nosek, B. A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General*, 134(4), 565–584.
- O’Keeffe, G. S., & Clarke-Pearson, K. (2011). The impact of social media on children, adolescents, and families. *Pediatrics*, (127)4, 800–4. doi:10.1542/peds.2011-0054.
- Olson, M. A., & Fazio, R. H. (2003). Relations between implicit measures of prejudice what are we measuring? *Psychological Science*, 14, 636–639.
- Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Malden, MA: Wiley-Blackwell.
- Penton-Voak, I. S., Jones, B. C., Little, A. C., Baker, S., Tiddeman, B., Burt, D. M., & Perrett, D. I. (2001). Symmetry, sexual dimorphism in facial proportions and male facial attractiveness. *Proceedings of the Royal Society B: Biological Sciences*, 268, 1617–1623.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In *Communication and persuasion: Central and peripheral routes to attitude change* (pp. 1–24). New York, NY: Springer. doi:10.1007/978-1-4612-4964-1.
- Petty, R. E., Wegener, D. T., & Fabrigar, L. R. (1997). Attitudes and attitude change. *Annual Review of Psychology*, 48, 609–647.

- Pliner, P., Hart, H., Kohl, J., & Saari, D. (1974). Compliance without pressure: Some further data on the foot-in-the-door technique. *Journal of Experimental Social Psychology*, 10, 17–22.
- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology*, 75, 811–832.
- Regan, P. C., & Berscheid, E. (1997). Gender differences in characteristics desired in a potential sexual and marriage partner. *Journal of Psychology & Human Sexuality*, 9, 25–37.
- Rhodes, N., & Wood, W. (1992). Self-esteem and intelligence affect influenceability: The mediating role of message reception. *Psychological Bulletin*, 111, 156–171.
- Richard, F. D., Bond, C. F., Jr., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology*, 7(4), 331–363. doi:10.1037/1089-2680.7.4.331.
- Riggio, H. R., & Garcia, A. L. (2009). The power of situations: Jonestown and the fundamental attribution error. *Teaching of Psychology*, 36(2), 108–112. doi:10.1080/00986280902739636.
- Rikowski, A., & Grammer, K. (1999). Human body odour, symmetry and attractiveness. *Proceedings of the Royal Society B: Biological Sciences*, 266(1422), 869–874. doi:10.1098/rspb.1999.0717.
- Roesch, S. C., & Amirkham, J. H. (1997). Boundary conditions for self-serving attributions: Another look at the sports pages. *Journal of Applied Social Psychology*, 27, 245–261.
- Rojek, J., Rosenfeld, R., & Decker, S. (2012). Policing race: The racial stratification of searches in police traffic stops. *Criminology*, 50, 993–1024.
- Rosenberg, M. J., & Hovland, C. I. (1960). Cognitive, affective and behavioral components of attitudes. In *Attitude organization and change: An analysis of consistency among attitude components* (pp. 1–14). New Haven and London: Yale University Press.
- Rosenthal, R., & Jacobson, L. F. (1968). Teacher expectations for the disadvantaged. *Scientific American*, 218, 19–23.
- Ross, L. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. *Advances in Experimental Social Psychology*, 10, 173–220.
- Ross, L., Amabile, T. M., & Steinmetz, J. L. (1977). Social roles, social control, and biases in social-perception processes. *Journal of Personality and Social Psychology*, 35, 485–494.
- Ross, L., & Nisbett, R. E. (1991). *The person and the situation: Perspectives of social psychology*. New York, NY: McGraw-Hill.
- Rudman, L. A. (1998). Self-promotion as a risk factor for women: The costs and benefits of counterstereotypical impression management. *Journal of Personality and Social Psychology*, 74(3), 629–645.
- Rusbult, C. E., & Van Lange, P. A. (2003). Interdependence, interaction, and relationships. *Annual Review of Psychology*, 54, 351–575.
- Schank, R. C., Abelson, R. (1977). *Scripts, plans, goals, and understanding: An inquiry into human knowledge*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Shepperd, J. A., & Taylor, K. M. (1999). Social loafing and expectancy-value theory. *Personality and Social Psychology Bulletin*, 25, 1147–1158.

- Singh, D. (1993). Adaptive significance of female physical attractiveness: Role of waist-to-hip ratio. *Journal of Personality and Social Psychology*, 65, 293–307.
- Sommers, S. R., & Ellsworth, P. C. (2000). Race in the courtroom: Perceptions of guilt and dispositional attributions. *Personality and Social Psychology Bulletin*, 26, 1367–1379.
- Spears, B., Slee, P., Owens, L., & Johnson, B. (2009). Behind the scenes and screens: Insights into the human dimension of covert and cyberbullying. *Journal of Psychology*, 217(4), 189–196. doi:10.1027/0044-3409.217.4.189.
- Sternberg, R. J. (1986). A triangular theory of love. *Psychological Review*, 93, 119–135.
- Stewart, J. B. (2002). *Heart of a soldier*. New York, NY: Simon and Schuster.
- Sutton, R.M. and Douglas, K.M. (2005). Justice for all, or just for me? More support for self-other differences in just world beliefs. *Personality and Individual Differences*, 9(3). pp. 637-645. ISSN 0191-8869.
- Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information*, 13(2), 65–93.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–48). Monterey, CA: Brooks-Cole.
- Tavris, C., & Aronson, E. (2008). *Mistakes were made (but not by me): Why we justify foolish beliefs, bad decisions, and hurtful acts*. New York, NY: Houghton Mifflin Harcourt.
- Taylor, L. S., Fiore, A. T., Mendelsohn, G. A., & Cheshire, C. (2011). “Out of my league”: A real-world test of the matching hypothesis. *Personality and Social Psychology Bulletin*, 37(7), 942–954. doi:10.1177/0146167211409947.
- Teger, A. I., & Pruitt, D. G. (1967). Components of group risk taking. *Journal of Experimental Social Psychology*, 3, 189–205.
- Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality*, 69, 907–924.
- van Veen, V., Krug, M. K., Schooler, J. W., & Carter, C. S. (2009). Neural activity predicts attitude change in cognitive dissonance. *Nature Neuroscience*, 12, 1469–1474.
- Vandebosch, H., & Van Cleemput, K. (2009). Cyberbullying among youngsters: Profiles of bullies and victims. *New media & Society*, 11(8), 1349–1371. doi:10.1177/1461444809341263.
- Walker, M. B., & Andrade, M. G. (1996). Conformity in the Asch task as a function of age. *The Journal of Social Psychology*, 136, 367–372.
- Walster, E., & Festinger, L. (1962). The effectiveness of “overheard” persuasive communications. *Journal of Abnormal and Social Psychology*, 65, 395–402.
- Wason, P. C., & Johnson-Laird, P. N. (1972). *The psychology of deduction: Structure and content*. Cambridge, MA: Harvard University Press.
- Weiner, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology*, 71(1), 3–25.
- Wilson, M., & Daly, M. (1985). Competitiveness, risk taking, and violence: The young male syndrome. *Ethology and Sociobiology*, 6, 59–73.

- Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review*, 107, 101–126.
- Zajonc, R. B. (1965). Social facilitation. *Science*, 149(3681), 269–274. doi:10.1126/science.149.3681.269
- Zimbardo, P. G. (2013). An end to the experiment [Slide show of the Stanford prison experiment]. Retrieved from <http://www.prisonexp.org/psychology/37>.

PART XIII

PSYCHOLOGICAL DISORDERS



A wreath is laid in memoriam to victims of the Washington Navy Yard shooting. (credit: modification of work by D. Myles Cullen, US Department of Defense)

On Monday, September 16, 2013, a gunman killed 12 people as the workday began at the Washington Navy Yard in Washington, DC. Aaron Alexis, 34, had a troubled history: he thought that he was being controlled by radio waves. He called the police to complain about voices in his head and being under surveillance by “shadowy forces” (Thomas, Levine, Date, & Cloherty, 2013). While Alexis’s actions cannot be excused, it is clear that he had some form of mental illness. Mental illness is not necessarily a cause of violence; it is far more likely that the mentally ill will be victims rather than perpetrators of violence (Stuart, 2003). If, however, Alexis had received the help he needed, this tragedy might have been averted.

69.

WHAT ARE PSYCHOLOGICAL DISORDERS?

Learning Objectives

By the end of this section, you will be able to:

- Understand the problems inherent in defining the concept of psychological disorder
- Describe what is meant by harmful dysfunction
- Identify the formal criteria that thoughts, feelings, and behaviors must meet to be considered abnormal and, thus, symptomatic of a psychological disorder

A **psychological disorder** is *a condition characterized by abnormal thoughts, feelings, and behaviors*. Psychopathology is the study of psychological disorders, including their symptoms, etiology (i.e., their causes), and treatment. The term *psychopathology* can also refer to the manifestation of a psychological disorder. Although consensus can be difficult, it is extremely important for mental health professionals to agree on what kinds of thoughts, feelings, and behaviors are truly abnormal in the sense that they genuinely indicate the presence of psychopathology. Certain patterns of behavior and inner experience can easily be labeled as abnormal and clearly signify some kind of psychological disturbance. The person who washes his hands 40 times per day and the person who claims to hear the voices of demons exhibit behaviors and inner experiences that most would regard as abnormal: beliefs and behaviors that suggest the existence of a psychological disorder. But, consider the nervousness a young man feels when talking to attractive women or the loneliness and longing for home a freshman experiences during her first semester of college—these feelings may not be regularly present, but they fall in the range of normal. So, what kinds of thoughts, feelings, and behaviors represent a true psychological disorder? Psychologists work to distinguish psychological disorders from inner experiences and behaviors that are merely situational, idiosyncratic, or unconventional.

Definition of a Psychological Disorder

Perhaps the simplest approach to conceptualizing psychological disorders is to label behaviors, thoughts, and inner experiences that are atypical, distressful, dysfunctional, and sometimes even dangerous, as signs of a disorder. For example, if you ask a classmate for a date and you are rejected, you probably would feel a little dejected. Such feelings would be normal. If you felt extremely depressed—so much so that you lost interest in activities, had difficulty eating or sleeping, felt utterly worthless, and contemplated suicide—your feelings would be atypical, would deviate from the norm, and could signify the presence of a psychological disorder. Just because something is atypical, however, does not necessarily mean it is disordered.

For example, only about 4% of people in the United States have red hair, so red hair is considered an atypical characteristic, but it is not considered disordered, it's just unusual. And it is less unusual in Scotland, where approximately 13% of the population has red hair (“DNA Project Aims,” 2012). As you will learn, some disorders, although not exactly typical, are far from atypical, and the rates in which they appear in the population are surprisingly high.



(a)



(b)



(c)

Red hair is considered unusual, but not abnormal. (a) Isla Fischer, (b) Prince Harry, and (c) Marcia Cross are three natural redheads. (credit a: modification of work by Richard Goldschmidt; credit b: modification of work by Glyn Lowe; credit c: modification of work by Kirk Weaver)

If we can agree that merely being atypical is an insufficient criterion for having a psychological disorder, is it reasonable to consider behavior or inner experiences that differ from widely expected cultural values or expectations as disordered? Using this criterion, a woman who walks around a subway platform wearing a heavy winter coat in July while screaming obscenities at strangers may be considered as exhibiting symptoms of a psychological disorder. Her actions and clothes violate socially accepted rules governing appropriate dress and behavior; these characteristics are atypical.

Cultural Expectations

Violating cultural expectations is not, in and of itself, a satisfactory means of identifying the presence of a psychological disorder. Since behavior varies from one culture to another, what may be expected and considered appropriate in one culture may not be viewed as such in other cultures. For example, returning a stranger's smile is expected in the United States because a pervasive social norm dictates that we reciprocate friendly gestures. A person who refuses to acknowledge such gestures might be considered socially awkward—perhaps even disordered—for violating this expectation. However, such expectations are not universally shared. Cultural expectations in Japan involve showing reserve, restraint, and a concern for maintaining privacy around strangers. Japanese people are generally unresponsive to smiles from strangers (Patterson et al., 2007). Eye contact provides another example. In the United States and Europe, eye contact with others typically signifies honesty and attention. However, most Latin-American, Asian, and African cultures interpret direct eye contact as rude, confrontational, and aggressive (Pazain, 2010). Thus, someone who makes eye contact with you could be considered appropriate and respectful or brazen and offensive, depending on your culture.



Eye contact is one of many social gestures that vary from culture to culture.
(credit: Joi Ito)

Hallucinations (seeing or hearing things that are not physically present) in Western societies is a violation of cultural expectations, and a person who reports such inner experiences is readily labeled as psychologically disordered. In other cultures, visions that, for example, pertain to future events may be regarded as normal experiences that are positively valued (Bourguignon, 1970). Finally, it is important to recognize that cultural

norms change over time: what might be considered typical in a society at one time may no longer be viewed this way later, similar to how fashion trends from one era may elicit quizzical looks decades later—imagine how a headband, legwarmers, and the big hair of the 1980s would go over on your campus today.

The Myth of Mental Illness

In the 1950s and 1960s, the concept of mental illness was widely criticized. One of the major criticisms focused on the notion that mental illness was a “myth that justifies psychiatric intervention in socially disapproved behavior” (Wakefield, 1992). Thomas Szasz (1960), a noted psychiatrist, was perhaps the biggest proponent of this view. Szasz argued that the notion of mental illness was invented by society (and the mental health establishment) to stigmatize and subjugate people whose behavior violates accepted social and legal norms. Indeed, Szasz suggested that what appear to be symptoms of mental illness are more appropriately characterized as “problems in living” (Szasz, 1960).

In his 1961 book, *The Myth of Mental Illness: Foundations of a Theory of Personal Conduct*, Szasz expressed his disdain for the concept of mental illness and for the field of psychiatry in general (Oliver, 2006). The basis for Szasz’s attack was his contention that detectable abnormalities in bodily structures and functions (e.g., infections and organ damage or dysfunction) represent the defining features of genuine illness or disease, and because symptoms of purported mental illness are not accompanied by such detectable abnormalities, so-called psychological disorders are not disorders at all. Szasz (1961/2010) proclaimed that “disease or illness can only affect the body; hence, there can be no mental illness” (p. 267).

Today, we recognize the extreme level of psychological suffering experienced by people with psychological disorders: the painful thoughts and feelings they experience, the disordered behavior they demonstrate, and the levels of distress and impairment they exhibit. This makes it very difficult to deny the reality of mental illness.

However controversial Szasz’s views and those of his supporters might have been, they have influenced the mental health community and society in several ways. First, lay people, politicians, and professionals now often refer to mental illness as mental health “problems,” implicitly acknowledging the “problems in living” perspective Szasz described (Buchanan-Barker & Barker, 2009). Also influential was Szasz’s view of homosexuality. Szasz was perhaps the first psychiatrist to openly challenge the idea that homosexuality represented a form of mental illness or disease (Szasz, 1965). By challenging the idea that homosexuality represented a form a mental illness, Szasz helped pave the way for the social and civil rights that gay and lesbian people now have (Barker, 2010). His work also inspired legal changes that protect the rights of people in psychiatric institutions and allow such individuals a greater degree of influence and responsibility over their lives (Buchanan-Barker & Barker, 2009).

Harmful Dysfunction

If none of the criteria discussed so far is adequate by itself to define the presence of a psychological disorder, how can a disorder be conceptualized? Many efforts have been made to identify the specific dimensions of psychological disorders, yet none is entirely satisfactory. No universal definition of psychological disorder exists that can apply to all situations in which a disorder is thought to be present (Zachar & Kendler, 2007). However, one of the more influential conceptualizations was proposed by Wakefield (1992), who defined psychological disorder as a harmful dysfunction. Wakefield argued that natural internal mechanisms—that is, psychological processes honed by evolution, such as cognition, perception, and learning—have important functions, such as enabling us to experience the world the way others do and to engage in rational thought, problem solving, and communication. For example, learning allows us to associate a fear with a potential danger in such a way that the intensity of fear is roughly equal to the degree of actual danger. Dysfunction occurs when an internal mechanism breaks down and can no longer perform its normal function. But, the presence of a dysfunction by itself does not determine a disorder. The dysfunction must be harmful in that it leads to negative consequences for the individual or for others, as judged by the standards of the individual's culture. The harm may include significant internal anguish (e.g., high levels of anxiety or depression) or problems in day-to-day living (e.g., in one's social or work life).

To illustrate, Janet has an extreme fear of spiders. Janet's fear might be considered a dysfunction in that it signals that the internal mechanism of learning is not working correctly (i.e., a faulty process prevents Janet from appropriately associating the magnitude of her fear with the actual threat posed by spiders). Janet's fear of spiders has a significant negative influence on her life: she avoids all situations in which she suspects spiders to be present (e.g., the basement or a friend's home), and she quit her job last month because she saw a spider in the restroom at work and is now unemployed. According to the harmful dysfunction model, Janet's condition would signify a disorder because (a) there is a dysfunction in an internal mechanism, and (b) the dysfunction has resulted in harmful consequences. Similar to how the symptoms of physical illness reflect dysfunctions in biological processes, the symptoms of psychological disorders presumably reflect dysfunctions in mental processes. The internal mechanism component of this model is especially appealing because it implies that disorders may occur through a breakdown of biological functions that govern various psychological processes, thus supporting contemporary neurobiological models of psychological disorders (Fabrega, 2007).

The American Psychiatric Association (APA) Definition

Many of the features of the harmful dysfunction model are incorporated in a formal definition of psychological disorder developed by the American Psychiatric Association (APA). According to the APA (2013), a psychological disorder is a condition that is said to consist of the following:

- **There are significant disturbances in thoughts, feelings, and behaviors.** A person must experience inner states (e.g., thoughts and/or feelings) and exhibit behaviors that are clearly disturbed—that is, unusual, but in a negative, self-defeating way. Often, such disturbances are troubling to those around the individual who experiences them. For example, an individual who is uncontrollably preoccupied by thoughts of germs spends hours each day bathing, has inner experiences, and displays behaviors that most would consider atypical and negative (disturbed) and that would likely be troubling to family members.
- **The disturbances reflect some kind of biological, psychological, or developmental dysfunction.** Disturbed patterns of inner experiences and behaviors should reflect some flaw (dysfunction) in the internal biological, psychological, and developmental mechanisms that lead to normal, healthy psychological functioning. For example, the hallucinations observed in schizophrenia could be a sign of brain abnormalities.
- **The disturbances lead to significant distress or disability in one's life.** A person's inner experiences and behaviors are considered to reflect a psychological disorder if they cause the person considerable distress, or greatly impair his ability to function as a normal individual (often referred to as functional impairment, or occupational and social impairment). As an illustration, a person's fear of social situations might be so distressing that it causes the person to avoid all social situations (e.g., preventing that person from being able to attend class or apply for a job).
- **The disturbances do not reflect expected or culturally approved responses to certain events.** Disturbances in thoughts, feelings, and behaviors must be socially unacceptable responses to certain events that often happen in life. For example, it is perfectly natural (and expected) that a person would experience great sadness and might wish to be left alone following the death of a close family member. Because such reactions are in some ways culturally expected, the individual would not be assumed to signify a mental disorder.

Some believe that there is no essential criterion or set of criteria that can definitively distinguish all cases of disorder from nondisorder (Lilienfeld & Marino, 1999). In truth, no single approach to defining a psychological disorder is adequate by itself, nor is there universal agreement on where the boundary is between disordered and not disordered. From time to time we all experience anxiety, unwanted thoughts, and moments of sadness; our behavior at other times may not make much sense to ourselves or to others. These inner experiences and behaviors can vary in their intensity, but are only considered disordered when they are highly disturbing to us and/or others, suggest a dysfunction in normal mental functioning, and are associated with significant distress or disability in social or occupational activities.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=800#h5p-221>

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=800#h5p-222>

Critical Thinking Question

Discuss why thoughts, feelings, or behaviors that are merely atypical or unusual would not necessarily signify the presence of a psychological disorder. Provide an example.

Just because something is atypical or unusual does not mean it is disordered. A person may experience atypical inner experiences or exhibit unusual behaviors, but she would not be considered disordered if they are not distressing, disturbing, or reflecting a dysfunction. For

example, a classmate might stay up all night studying before exams; although atypical, this behavior is unlikely to possess any of the other criteria for psychological disorder mentioned previously.

Personal Application Question

Identify a behavior that is considered unusual or abnormal in your own culture; however, it would be considered normal and expected in another culture.

Summary

Psychological disorders are conditions characterized by abnormal thoughts, feelings, and behaviors. Although challenging, it is essential for psychologists and mental health professionals to agree on what kinds of inner experiences and behaviors constitute the presence of a psychological disorder. Inner experiences and behaviors that are atypical or violate social norms could signify the presence of a disorder; however, each of these criteria alone is inadequate. Harmful dysfunction describes the view that psychological disorders result from the inability of an internal mechanism to perform its natural function. Many of the features of harmful dysfunction conceptualization have been incorporated in the APA's formal definition of psychological disorders. According to this definition, the presence of a psychological disorder is signaled by significant disturbances in thoughts, feelings, and behaviors; these disturbances must reflect some kind of dysfunction (biological, psychological, or developmental), must cause significant impairment in one's life, and must not reflect culturally expected reactions to certain life events.

70.

DIAGNOSING AND CLASSIFYING PSYCHOLOGICAL DISORDERS

Learning Objectives

By the end of this section, you will be able to:

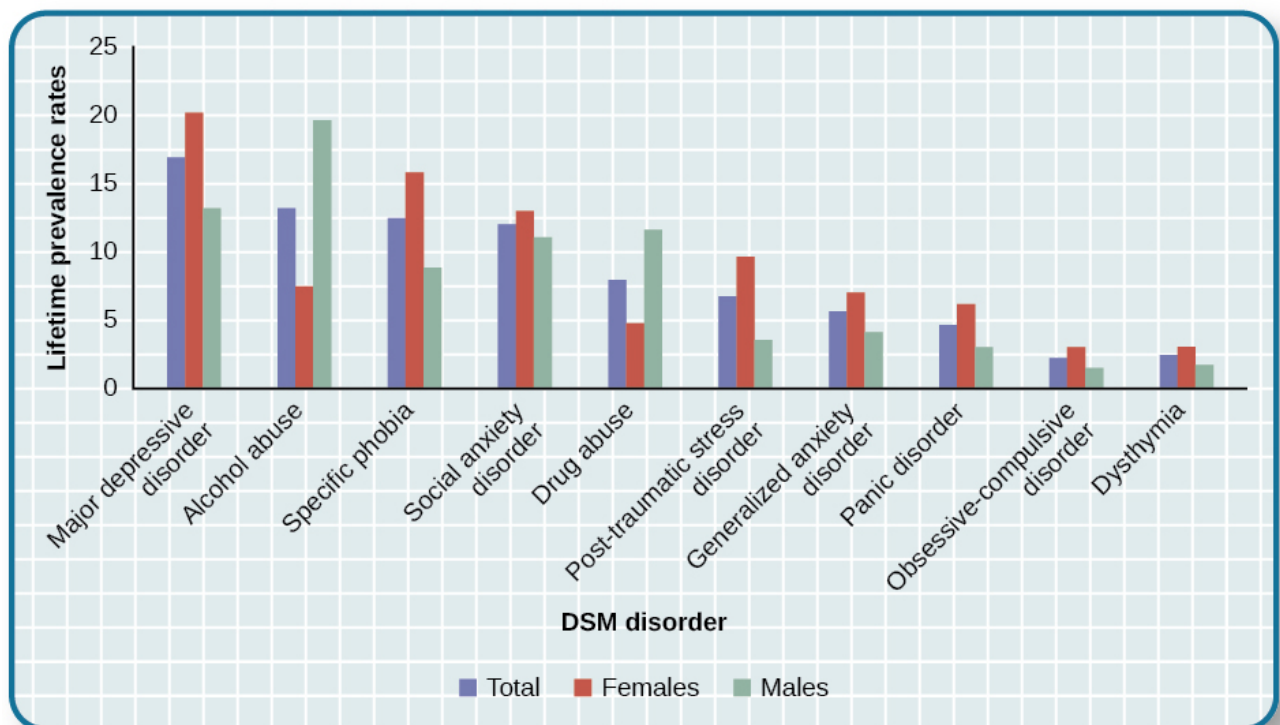
- Explain why classification systems are necessary in the study of psychopathology
- Describe the basic features of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)
- Discuss changes in the DSM over time, including criticisms of the current edition
- Identify which disorders are generally the most common

A first step in the study of psychological disorders is carefully and systematically discerning significant signs and symptoms. How do mental health professionals ascertain whether or not a person's inner states and behaviors truly represent a psychological disorder? Arriving at a proper diagnosis—that is, appropriately identifying and labeling a set of defined symptoms—is absolutely crucial. This process enables professionals to use a common language with others in the field and aids in communication about the disorder with the patient, colleagues and the public. A proper diagnosis is an essential element to guide proper and successful treatment. For these reasons, classification systems that organize psychological disorders systematically are necessary.

The Diagnostic and Statistical Manual of Mental Disorders (DSM)

Although a number of classification systems have been developed over time, the one that is used by most mental health professionals in the United States is the *Diagnostic and Statistical Manual of Mental Disorders*

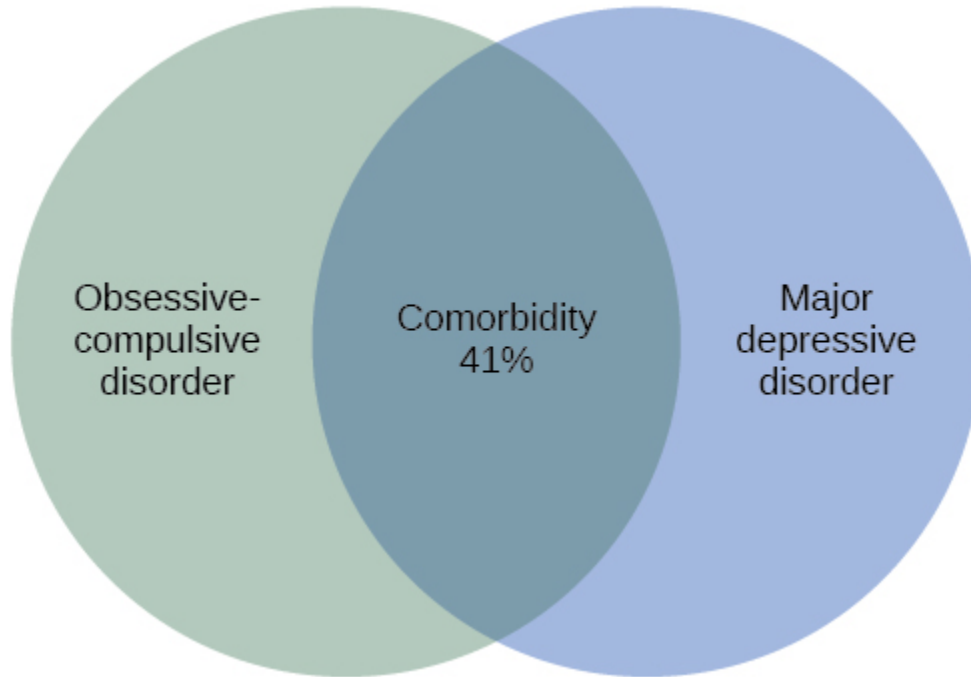
(DSM-5), published by the American Psychiatric Association (2013). (Note that the American Psychiatric Association differs from the American Psychological Association; both are abbreviated APA.) The first edition of the DSM, published in 1952, classified psychological disorders according to a format developed by the U.S. Army during World War II (Clegg, 2012). In the years since, the DSM has undergone numerous revisions and editions. The most recent edition, published in 2013, is the DSM-5 (APA, 2013). The DSM-5 includes many categories of disorders (e.g., anxiety disorders, depressive disorders, and dissociative disorders). Each disorder is described in detail, including an overview of the disorder (diagnostic features), specific symptoms required for diagnosis (diagnostic criteria), prevalence information (what percent of the population is thought to be afflicted with the disorder), and risk factors associated with the disorder. The chart below shows lifetime prevalence rates—the percentage of people in a population who develop a disorder in their lifetime—of various psychological disorders among U.S. adults. These data were based on a national sample of 9,282 U.S. residents (National Comorbidity Survey, 2007).



The graph shows the breakdown of psychological disorders, comparing the percentage prevalence among adult males and adult females in the United States. Because the data is from 2007, the categories shown here are from the DSM-IV, which has been supplanted by the DSM-5. Most categories remain the same; however, alcohol abuse now falls under a broader Alcohol Use Disorder category.

The DSM-5 also provides information about comorbidity; the co-occurrence of two disorders. For example, the DSM-5 mentions that 41% of people with obsessive-compulsive disorder (OCD) also meet the diagnostic criteria for major depressive disorder. Drug use is highly comorbid with other mental illnesses; 6 out of 10

people who have a substance use disorder also suffer from another form of mental illness (National Institute on Drug Abuse [NIDA], 2007).



Obsessive-compulsive disorder and major depressive disorder frequently occur in the same person.

The DSM has changed considerably in the half-century since it was originally published. The first two editions of the DSM, for example, listed homosexuality as a disorder; however, in 1973, the APA voted to remove it from the manual (Silverstein, 2009). Additionally, beginning with the DSM-III in 1980, mental disorders have been described in much greater detail, and the number of diagnosable conditions has grown steadily, as has the size of the manual itself. DSM-I included 106 diagnoses and was 130 total pages, whereas DSM-III included more than 2 times as many diagnoses (265) and was nearly seven times its size (886 total pages) (Mayes & Horowitz, 2005). Although DSM-5 is longer than DSM-IV, the volume includes only 237 disorders, a decrease from the 297 disorders that were listed in DSM-IV. The latest edition, DSM-5, includes revisions in the organization and naming of categories and in the diagnostic criteria for various disorders (Regier, Kuhl, & Kupfer, 2012), while emphasizing careful consideration of the importance of gender and cultural difference in the expression of various symptoms (Fisher, 2010).

Some believe that establishing new diagnoses might overpathologize the human condition by turning common human problems into mental illnesses (The Associated Press, 2013). Indeed, the finding that nearly half of all Americans will meet the criteria for a DSM disorder at some point in their life (Kessler et al., 2005) likely fuels much of this skepticism. The DSM-5 is also criticized on the grounds that its diagnostic criteria have been loosened, thereby threatening to “turn our current diagnostic inflation into diagnostic hyperinflation” (Frances, 2012, para. 22). For example, DSM-IV specified that the symptoms of major depressive disorder

must not be attributable to normal bereavement (loss of a loved one). The DSM-5, however, has removed this bereavement exclusion, essentially meaning that grief and sadness after a loved one's death can constitute major depressive disorder.

The International Classification of Diseases

A second classification system, the *International Classification of Diseases* (ICD), is also widely recognized. Published by the World Health Organization (WHO), the ICD was developed in Europe shortly after World War II and, like the DSM, has been revised several times. The categories of psychological disorders in both the DSM and ICD are similar, as are the criteria for specific disorders; however, some differences exist. Although the ICD is used for clinical purposes, this tool is also used to examine the general health of populations and to monitor the prevalence of diseases and other health problems internationally (WHO, 2013). The ICD is in its 10th edition (ICD-10); however, efforts are now underway to develop a new edition (ICD-11) that, in conjunction with the changes in DSM-5, will help harmonize the two classification systems as much as possible (APA, 2013).

A study that compared the use of the two classification systems found that worldwide the ICD is more frequently used for clinical diagnosis, whereas the DSM is more valued for research (Mezzich, 2002). Most research findings concerning the etiology and treatment of psychological disorders are based on criteria set forth in the DSM (Oltmanns & Castonguay, 2013). The DSM also includes more explicit disorder criteria, along with an extensive and helpful explanatory text (Regier et al., 2012). The DSM is the classification system of choice among U.S. mental health professionals, and this chapter is based on the DSM paradigm.

The Compassionate View of Psychological Disorders

As these disorders are outlined, please bear two things in mind. First, remember that psychological disorders represent *extremes* of inner experience and behavior. If, while reading about these disorders, you feel that these descriptions begin to personally characterize you, do not worry—this moment of enlightenment probably means nothing more than you are normal. Each of us experiences episodes of sadness, anxiety, and preoccupation with certain thoughts—times when we do not quite feel ourselves. These episodes should not be considered problematic unless the accompanying thoughts and behaviors become extreme and have a disruptive effect on one's life. Second, understand that people with psychological disorders are far more than just embodiments of their disorders. We do not use terms such as schizophrenics, depressives, or phobics because they are labels that objectify people who suffer from these conditions, thus promoting biased and disparaging assumptions about them. It is important to remember that a psychological disorder is not what a person *is*; it is something that a person *has*—through no fault of his or her own. As is the case with cancer or diabetes, those with psychological disorders suffer debilitating, often painful conditions that are not of

their own choosing. These individuals deserve to be viewed and treated with compassion, understanding, and dignity.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=802#h5p-224>

Summary

The diagnosis and classification of psychological disorders is essential in studying and treating psychopathology. The classification system used by most U.S. professionals is the DSM-5. The first edition of the DSM was published in 1952, and has undergone numerous revisions. The fifth and most recent edition, the DSM-5, was published in 2013. The diagnostic manual includes a total of 237 specific diagnosable disorders, each described in detail, including its symptoms, prevalence, risk factors, and comorbidity. Over time, the number of diagnosable conditions listed in the DSM has grown steadily, prompting criticism from some. Nevertheless, the diagnostic criteria in the DSM are more explicit than that of any other system, which makes the DSM system highly desirable for both clinical diagnosis and research.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=802#h5p-225>

Critical Thinking Questions

Describe the DSM-5. What is it, what kind of information does it contain, and why is it important to the study and treatment of psychological disorders?

The DSM-5 is the classification system of psychological disorders preferred by most U.S. mental health professionals, and it is published by the American Psychiatric Association (APA). It consists of broad categories of disorders and specific disorders that fall within each category. Each disorder has an explicit description of its symptoms, as well as information concerning prevalence, risk factors, and comorbidity. The DSM-5 provides a common language that enables mental health professionals to communicate effectively about sets of symptoms.

The International Classification of Diseases (ICD) and the DSM differ in various ways. What are some of the differences in these two classification systems?

The ICD is used primarily for making clinical diagnoses and more broadly for examining the general health of populations and monitoring the international prevalence of diseases and other health problems. While the DSM is also used for diagnostic purposes, it is also highly valued as a research tool. For example, much of the data regarding the etiology and treatment of psychological disorders are based on diagnostic criteria set forth in the DSM.

71.

PERSPECTIVES ON PSYCHOLOGICAL DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Discuss supernatural perspectives on the origin of psychological disorders, in their historical context
- Describe modern biological and psychological perspectives on the origin of psychological disorders
- Identify which disorders generally show the highest degree of heritability
- Describe the diathesis-stress model and its importance to the study of psychopathology

Scientists and mental health professionals may adopt different perspectives in attempting to understand or explain the underlying mechanisms that contribute to the development of a psychological disorder. The perspective used in explaining a psychological disorder is extremely important, in that it will consist of explicit assumptions regarding how best to study the disorder, its etiology, and what kinds of therapies or treatments are most beneficial. Different perspectives provide alternate ways for how to think about the nature of psychopathology.

Supernatural Perspectives of Psychological Disorders

For centuries, psychological disorders were viewed from a supernatural perspective: attributed to a force beyond scientific understanding. Those afflicted were thought to be practitioners of black magic or possessed

by spirits (Maher & Maher, 1985). For example, convents throughout Europe in the 16th and 17th centuries reported hundreds of nuns falling into a state of frenzy in which the afflicted foamed at the mouth, screamed and convulsed, sexually propositioned priests, and confessed to having carnal relations with devils or Christ. Although, today, these cases would suggest serious mental illness; at the time, these events were routinely explained as possession by devilish forces (Waller, 2009a). Similarly, grievous fits by young girls are believed to have precipitated the witch panic in New England late in the 17th century (Demos, 1983). Such beliefs in supernatural causes of mental illness are still held in some societies today; for example, beliefs that supernatural forces cause mental illness are common in some cultures in modern-day Nigeria (Aghukwa, 2012).



In *The Extraction of the Stone of Madness*, a 15th century painting by Hieronymus Bosch, a practitioner is using a tool to extract an object (the supposed “stone of madness”) from the head of an afflicted person.

DANCING MANIA

Between the 11th and 17th centuries, a curious epidemic swept across Western Europe. Groups of people would suddenly begin to dance with wild abandon. This compulsion to dance—referred to as dancing mania—sometimes gripped thousands of people at a time. Historical accounts indicate that those afflicted would sometimes dance with bruised and bloody feet for days or weeks, screaming of terrible visions and begging priests and monks to save their souls (Waller, 2009b). What caused dancing mania is not known, but several explanations have been proposed, including spider venom and ergot poisoning (“Dancing Mania,” 2011).

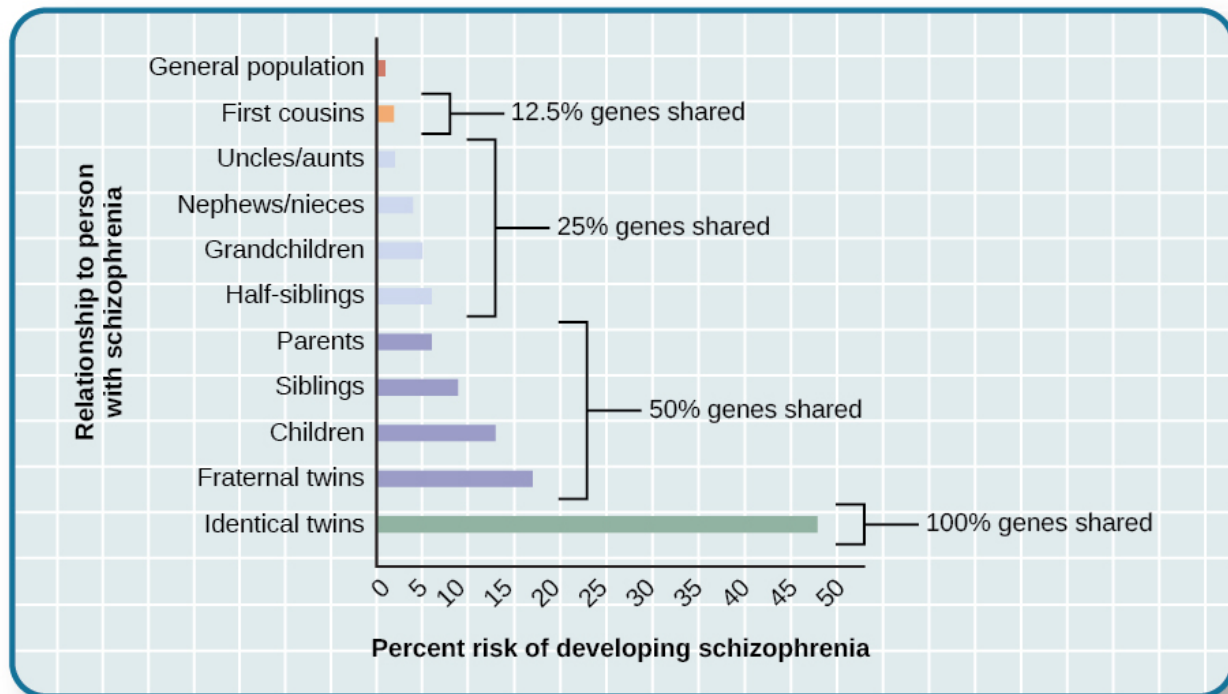


Although the cause of dancing mania, depicted in this painting, was unclear, the behavior was attributed to supernatural forces.

Historian John Waller (2009a, 2009b) has provided a comprehensive and convincing explanation of dancing mania that suggests the phenomenon was attributable to a combination of three factors: psychological distress, social contagion, and belief in supernatural forces. Waller argued that various disasters of the time (such as famine, plagues, and floods) produced high levels of psychological distress that could increase the likelihood of succumbing to an involuntary trance state. Waller indicated that anthropological studies and accounts of possession rituals show that people are more likely to enter a trance state if they expect it to happen, and that entranced individuals behave in a ritualistic manner, their thoughts and behavior shaped by the spiritual beliefs of their culture. Thus, during periods of extreme physical and mental distress, all it took were a few people—believing themselves to have been afflicted with a dancing curse—to slip into a spontaneous trance and then act out the part of one who is cursed by dancing for days on end.

Biological Perspectives of Psychological Disorders

The biological perspective views psychological disorders as linked to biological phenomena, such as genetic factors, chemical imbalances, and brain abnormalities; it has gained considerable attention and acceptance in recent decades (Wyatt & Midkiff, 2006). Evidence from many sources indicates that most psychological disorders have a genetic component; in fact, there is little dispute that some disorders are largely due to genetic factors.



A person's risk of developing schizophrenia increases if a relative has schizophrenia. The closer the genetic relationship, the higher the risk.

Findings such as these have led many of today's researchers to search for specific genes and genetic mutations that contribute to mental disorders. Also, sophisticated neural imaging technology in recent decades has revealed how abnormalities in brain structure and function might be directly involved in many disorders, and advances in our understanding of neurotransmitters and hormones have yielded insights into their possible connections. The biological perspective is currently thriving in the study of psychological disorders.

The Diathesis-Stress Model of Psychological Disorders

Despite advances in understanding the biological basis of psychological disorders, the psychosocial perspective is still very important. This perspective emphasizes the importance of learning, stress, faulty and self-defeating thinking patterns, and environmental factors. Perhaps the best way to think about psychological disorders, then, is to view them as originating from a combination of biological and psychological processes. Many develop not from a single cause, but from a delicate fusion between partly biological and partly psychosocial factors.

The diathesis-stress model (Zuckerman, 1999) integrates biological and psychosocial factors to predict the likelihood of a disorder. This diathesis-stress model suggests that people with an underlying predisposition for a disorder (i.e., a diathesis) are more likely than others to develop a disorder when faced with adverse environmental or psychological events (i.e., stress), such as childhood maltreatment, negative life events, trauma, and so on. A diathesis is not always a biological vulnerability to an illness; some diatheses may be psychological (e.g., a tendency to think about life events in a pessimistic, self-defeating way).

The key assumption of the diathesis-stress model is that both factors, diathesis and stress, are necessary in the development of a disorder. Different models explore the relationship between the two factors: the level of stress needed to produce the disorder is inversely proportional to the level of diathesis.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=804#h5p-227>

Summary

Psychopathology is very complex, involving a plethora of etiological theories and perspectives. For centuries,

psychological disorders were viewed primarily from a supernatural perspective and thought to arise from divine forces or possession from spirits. Some cultures continue to hold this supernatural belief. Today, many who study psychopathology view mental illness from a biological perspective, whereby psychological disorders are thought to result largely from faulty biological processes. Indeed, scientific advances over the last several decades have provided a better understanding of the genetic, neurological, hormonal, and biochemical bases of psychopathology. The psychological perspective, in contrast, emphasizes the importance of psychological factors (e.g., stress and thoughts) and environmental factors in the development of psychological disorders. A contemporary, promising approach is to view disorders as originating from an integration of biological and psychosocial factors. The diathesis-stress model suggests that people with an underlying diathesis, or vulnerability, for a psychological disorder are more likely than those without the diathesis to develop the disorder when faced with stressful events.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=804#h5p-228>

Critical Thinking Question

Why is the perspective one uses in explaining a psychological disorder important?
The perspective one uses in explaining a psychological disorder consists of assumptions that will guide how to best study and understand the nature of a disorder, including its causes, and how to most effectively treat the disorder.

Personal Application Question

Even today, some believe that certain occurrences have supernatural causes. Think of an event, recent or historical, for which others have provided supernatural explanation.

72.

ANXIETY DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Distinguish normal anxiety from pathological anxiety
- List and describe the major anxiety disorders, including their main features and prevalence
- Describe basic psychological and biological factors that are suspected to be important in the etiology of anxiety disorder

Everybody experiences anxiety from time to time. Although anxiety is closely related to fear, the two states possess important differences. Fear involves an instantaneous reaction to an imminent threat, whereas anxiety involves apprehension, avoidance, and cautiousness regarding a potential threat, danger, or other negative event (Craske, 1999). While anxiety is unpleasant to most people, it is important to our health, safety, and well-being. Anxiety motivates us to take actions—such as preparing for exams, watching our weight, showing up to work on time—that enable us to avert potential future problems. Anxiety also motivates us to avoid certain things—such as running up debts and engaging in illegal activities—that could lead to future trouble. Most individuals' level and duration of anxiety approximates the magnitude of the potential threat they face. For example, suppose a single woman in her late 30s who wishes to marry is concerned about the possibility of having to settle for a spouse who is less attractive and educated than desired. This woman likely would experience anxiety of greater intensity and duration than would a 21-year-old college junior who is having trouble finding a date for the annual social. Some people, however, experience anxiety that is excessive, persistent, and greatly out of proportion to the actual threat; if one's anxiety has a disruptive influence on one's life, this is a strong indicator that the individual is experiencing an anxiety disorder.

Anxiety disorders are characterized by excessive and persistent fear and anxiety, and by related disturbances in behavior (APA, 2013). Although anxiety is universally experienced, anxiety disorders cause considerable distress. As a group, anxiety disorders are common: approximately 25%–30% of the U.S. population meets the

criteria for at least one anxiety disorder during their lifetime (Kessler et al., 2005). Also, these disorders appear to be much more common in women than they are in men; within a 12-month period, around 23% of women and 14% of men will experience at least one anxiety disorder (National Comorbidity Survey, 2007). Anxiety disorders are the most frequently occurring class of mental disorders and are often comorbid with each other and with other mental disorders (Kessler, Ruscio, Shear, & Wittchen, 2009).

Specific Phobia

Phobia is a Greek word that means fear. A person diagnosed with a specific phobia (formerly known as simple phobia) experiences excessive, distressing, and persistent fear or anxiety about a specific object or situation (such as animals, enclosed spaces, elevators, or flying) (APA, 2013). Even though people realize their level of fear and anxiety in relation to the phobic stimulus is irrational, some people with a specific phobia may go to great lengths to avoid the phobic stimulus (the object or situation that triggers the fear and anxiety). Typically, the fear and anxiety a phobic stimulus elicits is disruptive to the person's life. For example, a man with a phobia of flying might refuse to accept a job that requires frequent air travel, thus negatively affecting his career. Clinicians who have worked with people who have specific phobias have encountered many kinds of phobias.

Specific Phobias

Phobia	Feared Object or Situation
Acrophobia	heights
Aerophobia	flying
Arachnophobia	spiders
Claustrophobia	enclosed spaces
Cynophobia	dogs
Hematophobia	blood
Ophidiophobia	snakes
Taphophobia	being buried alive
Trypanophobia	injections
Xenophobia	strangers

Specific phobias are common; in the United States, around 12.5% of the population will meet the criteria for a specific phobia at some point in their lifetime (Kessler et al., 2005). One type of phobia, agoraphobia, is listed in the DSM-5 as a separate anxiety disorder. Agoraphobia, which literally means “fear of the marketplace,” is characterized by intense fear, anxiety, and avoidance of situations in which it might be difficult to escape

or receive help if one experiences symptoms of a panic attack (a state of extreme anxiety that we will discuss shortly). These situations include public transportation, open spaces (parking lots), enclosed spaces (stores), crowds, or being outside the home alone (APA, 2013). About 1.4% of Americans experience agoraphobia during their lifetime (Kessler et al., 2005).

Acquisition of Phobias through Learning

Many theories suggest that phobias develop through learning. Rachman (1977) proposed that phobias can be acquired through three major learning pathways. The first pathway is through classical conditioning. As you may recall, classical conditioning is a form of learning in which a previously neutral stimulus is paired with an unconditioned stimulus (UCS) that reflexively elicits an unconditioned response (UCR), eliciting the same response through its association with the unconditioned stimulus. The response is called a conditioned response (CR). For example, a child who has been bitten by a dog may come to fear dogs because of her past association with pain. In this case, the dog bite is the UCS and the fear it elicits is the UCR. Because a dog was associated with the bite, any dog may come to serve as a conditioned stimulus, thereby eliciting fear; the fear the child experiences around dogs, then, becomes a CR.

The second pathway of phobia acquisition is through vicarious learning, such as modeling. For example, a child who observes his cousin react fearfully to spiders may later express the same fears, even though spiders have never presented any danger to him. This phenomenon has been observed in both humans and nonhuman primates (Olsson & Phelps, 2007). A study of laboratory-reared monkeys readily acquired a fear of snakes after observing wild-reared monkeys react fearfully to snakes (Mineka & Cook, 1993).

The third pathway is through verbal transmission or information. For example, a child whose parents, siblings, friends, and classmates constantly tell her how disgusting and dangerous snakes are may come to acquire a fear of snakes.

Interestingly, people are more likely to develop phobias of things that do not represent much actual danger to themselves, such as animals and heights, and are less likely to develop phobias toward things that present legitimate danger in contemporary society, such as motorcycles and weapons (Öhman & Mineka, 2001). Why might this be so? One theory suggests that the human brain is evolutionarily predisposed to more readily associate certain objects or situations with fear (Seligman, 1971). This theory argues that throughout our evolutionary history, our ancestors associated certain stimuli (e.g., snakes, spiders, heights, and thunder) with potential danger. As time progressed, the mind has become adapted to more readily develop fears of these things than of others. Experimental evidence has consistently demonstrated that conditioned fears develop more readily to fear-relevant stimuli (images of snakes and spiders) than to fear-irrelevant stimuli (images of flowers and berries) (Öhman & Mineka, 2001). Such prepared learning has also been shown to occur in monkeys. In one study (Cook & Mineka, 1989), monkeys watched videotapes of model monkeys reacting

fearfully to either fear-relevant stimuli (toy snakes or a toy crocodile) or fear-irrelevant stimuli (flowers or a toy rabbit). The observer monkeys developed fears of the fear-relevant stimuli but not the fear-irrelevant stimuli.

Social Anxiety Disorder

Social anxiety disorder (formerly called social phobia) is characterized by extreme and persistent fear or anxiety and avoidance of social situations in which the person could potentially be evaluated negatively by others (APA, 2013). As with specific phobias, social anxiety disorder is common in the United States; a little over 12% of all Americans experience social anxiety disorder during their lifetime (Kessler et al., 2005).

The heart of the fear and anxiety in social anxiety disorder is the person's concern that he may act in a humiliating or embarrassing way, such as appearing foolish, showing symptoms of anxiety (blushing), or doing or saying something that might lead to rejection (such as offending others). The kinds of social situations in which individuals with social anxiety disorder usually have problems include public speaking, having a conversation, meeting strangers, eating in restaurants, and, in some cases, using public restrooms. Although many people become anxious in social situations like public speaking, the fear, anxiety, and avoidance experienced in social anxiety disorder are highly distressing and lead to serious impairments in life. Adults with this disorder are more likely to experience lower educational attainment and lower earnings (Katzelnick et al., 2001), perform more poorly at work and are more likely to be unemployed (Moitra, Beard, Weisberg, & Keller, 2011), and report greater dissatisfaction with their family lives, friends, leisure activities, and income (Stein & Kean, 2000).

When people with social anxiety disorder are unable to avoid situations that provoke anxiety, they typically perform safety behaviors: mental or behavioral acts that reduce anxiety in social situations by reducing the chance of negative social outcomes. Safety behaviors include avoiding eye contact, rehearsing sentences before speaking, talking only briefly, and not talking about oneself (Alden & Bieling, 1998). Other examples of safety behaviors include the following (Marker, 2013):

- assuming roles in social situations that minimize interaction with others (e.g., taking pictures, setting up equipment, or helping prepare food)
- asking people many questions to keep the focus off of oneself
- selecting a position to avoid scrutiny or contact with others (sitting in the back of the room)
- wearing bland, neutral clothes to avoid drawing attention to oneself
- avoiding substances or activities that might cause anxiety symptoms (such as caffeine, warm clothing, and physical exercise)

Although these behaviors are intended to prevent the person with social anxiety disorder from doing something awkward that might draw criticism, these actions usually exacerbate the problem because they do

not allow the individual to disconfirm his negative beliefs, often eliciting rejection and other negative reactions from others (Alden & Bieling, 1998).

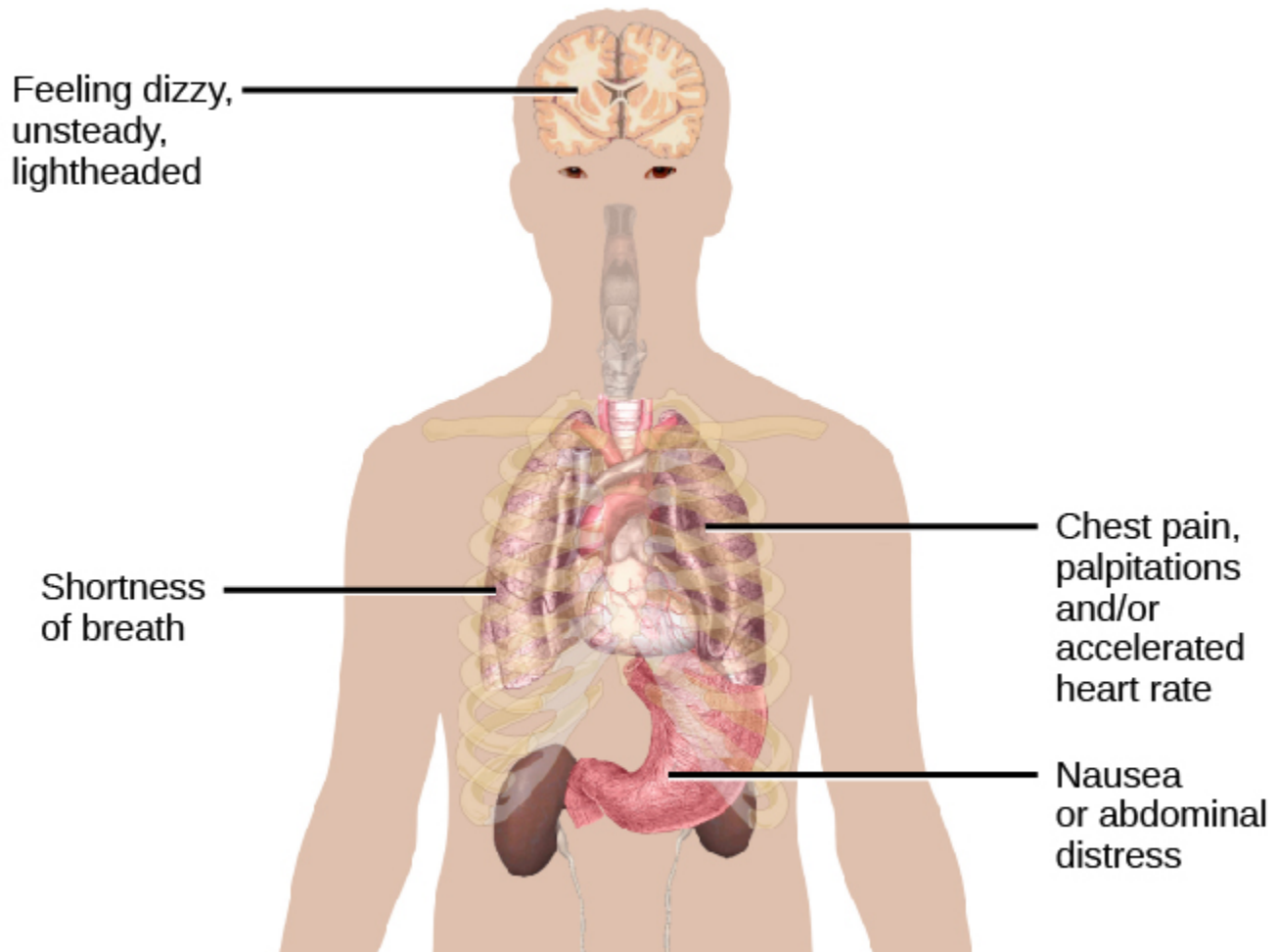
People with social anxiety disorder may resort to self-medication, such as drinking alcohol, as a means to avert the anxiety symptoms they experience in social situations (Battista & Kocovski, 2010). The use of alcohol when faced with such situations may become negatively reinforcing: encouraging individuals with social anxiety disorder to turn to the substance whenever they experience anxiety symptoms. The tendency to use alcohol as a coping mechanism for social anxiety, however, can come with a hefty price tag: a number of large scale studies have reported a high rate of comorbidity between social anxiety disorder and alcohol use disorder (Morris, Stewart, & Ham, 2005).

As with specific phobias, it is highly probable that the fears inherent to social anxiety disorder can develop through conditioning experiences. For example, a child who is subjected to early unpleasant social experiences (e.g., bullying at school) may develop negative social images of herself that become activated later in anxiety-provoking situations (Hackmann, Clark, & McManus, 2000). Indeed, one study reported that 92% of a sample of adults with social anxiety disorder reported a history of severe teasing in childhood, compared to only 35% of a sample of adults with panic disorder (McCabe, Antony, Summerfeldt, Liss, & Swinson, 2003).

One of the most well-established risk factors for developing social anxiety disorder is behavioral inhibition (Clauss & Blackford, 2012). Behavioral inhibition is thought to be an inherited trait, and it is characterized by a consistent tendency to show fear and restraint when presented with unfamiliar people or situations (Kagan, Reznick, & Snidman, 1988). Behavioral inhibition is displayed very early in life; behaviorally inhibited toddlers and children respond with great caution and restraint in unfamiliar situations, and they are often timid, fearful, and shy around unfamiliar people (Fox, Henderson, Marshall, Nichols, & Ghera, 2005). A recent statistical review of studies demonstrated that behavioral inhibition was associated with more than a sevenfold increase in the risk of development of social anxiety disorder, demonstrating that behavioral inhibition is a major risk factor for the disorder (Clauss & Blackford, 2012).

Panic Disorder

Imagine that you are at the mall one day with your friends and—suddenly and inexplicably—you begin sweating and trembling, your heart starts pounding, you have trouble breathing, and you start to feel dizzy and nauseous. This episode lasts for 10 minutes and is terrifying because you start to think that you are going to die. When you visit your doctor the following morning and describe what happened, she tells you that you have experienced a panic attack. If you experience another one of these episodes two weeks later and worry for a month or more that similar episodes will occur in the future, it is likely that you have developed panic disorder.



Some of the physical manifestations of a panic attack are shown. People may also experience sweating, trembling, feelings of faintness, or a fear of losing control, among other symptoms.

People with panic disorder experience recurrent (more than one) and unexpected panic attacks, along with at least one month of persistent concern about additional panic attacks, worry over the consequences of the attacks, or self-defeating changes in behavior related to the attacks (e.g., avoidance of exercise or unfamiliar situations) (APA, 2013). As is the case with other anxiety disorders, the panic attacks cannot result from the physiological effects of drugs and other substances, a medical condition, or another mental disorder. A panic attack is defined as a period of extreme fear or discomfort that develops abruptly and reaches a peak within 10 minutes. Its symptoms include accelerated heart rate, sweating, trembling, choking sensations, hot flashes or chills, dizziness or lightheadedness, fears of losing control or going crazy, and fears of dying (APA, 2013). Sometimes panic attacks are expected, occurring in response to specific environmental triggers (such as being in a tunnel); other times, these episodes are unexpected and emerge randomly (such as when relaxing). According to the DSM-5, the person must experience unexpected panic attacks to qualify for a diagnosis of panic disorder.

Experiencing a panic attack is often terrifying. Rather than recognizing the symptoms of a panic attack merely as signs of intense anxiety, individuals with panic disorder often misinterpret them as a sign that

something is intensely wrong internally (thinking, for example, that the pounding heart represents an impending heart attack). Panic attacks can occasionally precipitate trips to the emergency room because several symptoms of panic attacks are, in fact, similar to those associated with heart problems (e.g., palpitations, racing pulse, and a pounding sensation in the chest) (Root, 2000). Unsurprisingly, those with panic disorder fear future attacks and may become preoccupied with modifying their behavior in an effort to avoid future panic attacks. For this reason, panic disorder is often characterized as fear of fear (Goldstein & Chambless, 1978).

Panic attacks themselves are not mental disorders. Indeed, around 23% of Americans experience isolated panic attacks in their lives without meeting the criteria for panic disorder (Kessler et al., 2006), indicating that panic attacks are fairly common. Panic disorder is, of course, much less common, afflicting 4.7% of Americans during their lifetime (Kessler et al., 2005). Many people with panic disorder develop agoraphobia, which is marked by fear and avoidance of situations in which escape might be difficult or help might not be available if one were to develop symptoms of a panic attack. People with panic disorder often experience a comorbid disorder, such as other anxiety disorders or major depressive disorder (APA, 2013).

Researchers are not entirely sure what causes panic disorder. Children are at a higher risk of developing panic disorder if their parents have the disorder (Biederman et al., 2001), and family and twins studies indicate that the heritability of panic disorder is around 43% (Hettema, Neale, & Kendler, 2001). The exact genes and gene functions involved in this disorder, however, are not well-understood (APA, 2013). Neurobiological theories of panic disorder suggest that a region of the brain called the locus coeruleus may play a role in this disorder. Located in the brainstem, the locus coeruleus is the brain's major source of norepinephrine, a neurotransmitter that triggers the body's fight-or-flight response. Activation of the locus coeruleus is associated with anxiety and fear, and research with nonhuman primates has shown that stimulating the locus coeruleus either electrically or through drugs produces panic-like symptoms (Charney et al., 1990). Such findings have led to the theory that panic disorder may be caused by abnormal norepinephrine activity in the locus coeruleus (Bremner, Krystal, Southwick, & Charney, 1996).

Conditioning theories of panic disorder propose that panic attacks are classical conditioning responses to subtle bodily sensations resembling those normally occurring when one is anxious or frightened (Bouton, Mineka, & Barlow, 2001). For example, consider a child who has asthma. An acute asthma attack produces sensations, such as shortness of breath, coughing, and chest tightness, that typically elicit fear and anxiety. Later, when the child experiences subtle symptoms that resemble the frightening symptoms of earlier asthma attacks (such as shortness of breath after climbing stairs), he may become anxious, fearful, and then experience a panic attack. In this situation, the subtle symptoms would represent a conditioned stimulus, and the panic attack would be a conditioned response. The finding that panic disorder is nearly three times as frequent among people with asthma as it is among people without asthma (Weiser, 2007) supports the possibility that panic disorder has the potential to develop through classical conditioning.

Cognitive factors may play an integral part in panic disorder. Generally, cognitive theories (Clark, 1996) argue that those with panic disorder are prone to interpret ordinary bodily sensations catastrophically, and these fearful interpretations set the stage for panic attacks. For example, a person might detect bodily changes

that are routinely triggered by innocuous events such as getting up from a seated position (dizziness), exercising (increased heart rate, shortness of breath), or drinking a large cup of coffee (increased heart rate, trembling). The individual interprets these subtle bodily changes catastrophically (“Maybe I’m having a heart attack!”). Such interpretations create fear and anxiety, which trigger additional physical symptoms; subsequently, the person experiences a panic attack. Support of this contention rests with findings that people with more severe catastrophic thoughts about sensations have more frequent and severe panic attacks, and among those with panic disorder, reducing catastrophic cognitions about their sensations is as effective as medication in reducing panic attacks (Good & Hinton, 2009).

Generalized Anxiety Disorder

Alex was always worried about many things. He worried that his children would drown when they played at the beach. Each time he left the house, he worried that an electrical short circuit would start a fire in his home. He worried that his wife would lose her job at the prestigious law firm. He worried that his daughter’s minor staph infection could turn into a massive life-threatening condition. These and other worries constantly weighed heavily on Alex’s mind, so much so that they made it difficult for him to make decisions and often left him feeling tense, irritable, and worn out. One night, Alex’s wife was to drive their son home from a soccer game. However, his wife stayed after the game and talked with some of the other parents, resulting in her arriving home 45 minutes late. Alex had tried to call his cell phone three or four times, but he could not get through because the soccer field did not have a signal. Extremely worried, Alex eventually called the police, convinced that his wife and son had not arrived home because they had been in a terrible car accident.

Alex suffers from generalized anxiety disorder: a relatively continuous state of excessive, uncontrollable, and pointless worry and apprehension. People with generalized anxiety disorder often worry about routine, everyday things, even though their concerns are unjustified. For example, an individual may worry about her health and finances, the health of family members, the safety of her children, or minor matters (e.g., being late for an appointment) without having any legitimate reason for doing so (APA, 2013). A diagnosis of generalized anxiety disorder requires that the diffuse worrying and apprehension characteristic of this disorder—what Sigmund Freud referred to as free-floating anxiety—is not part of another disorder, occurs more days than not for at least six months, and is accompanied by any three of the following symptoms: restlessness, difficulty concentrating, being easily fatigued, muscle tension, irritability, and sleep difficulties.



Worry is a defining feature of generalized anxiety disorder. (credit: Freddie Peña)

About 5.7% of the U.S. population will develop symptoms of generalized anxiety disorder during their lifetime (Kessler et al., 2005), and females are 2 times as likely as males to experience the disorder (APA, 2013). Generalized anxiety disorder is highly comorbid with mood disorders and other anxiety disorders (Noyes, 2001), and it tends to be chronic. Also, generalized anxiety disorder appears to increase the risk for heart attacks and strokes, especially in people with preexisting heart conditions (Martens et al., 2010).

Although there have been few investigations aimed at determining the heritability of generalized anxiety disorder, a summary of available family and twin studies suggests that genetic factors play a modest role in the disorder (Hettema et al., 2001). Cognitive theories of generalized anxiety disorder suggest that worry represents a mental strategy to avoid more powerful negative emotions (Aikins & Craske, 2001), perhaps stemming from earlier unpleasant or traumatic experiences. Indeed, one longitudinal study found that childhood maltreatment was strongly related to the development of this disorder during adulthood (Moffitt et al., 2007); worrying might distract people from remembering painful childhood experiences.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it

online here:

<https://louis.pressbooks.pub/intropsychology/?p=806#h5p-230>

Summary

Anxiety disorders are a group of disorders in which a person experiences excessive, persistent, and distressing fear and anxiety that interferes with normal functioning. Anxiety disorders include specific phobia: a specific unrealistic fear; social anxiety disorder: extreme fear and avoidance of social situations; panic disorder: suddenly overwhelmed by panic even though there is no apparent reason to be frightened; agoraphobia: an intense fear and avoidance of situations in which it might be difficult to escape; and generalized anxiety disorder: a relatively continuous state of tension, apprehension, and dread.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=806#h5p-231>

Critical Thinking Question

Describe how cognitive theories of the etiology of anxiety disorders differ from learning theories.

Learning theories suggest that some anxiety disorders, especially specific phobia, can develop through a number of learning mechanisms. These mechanisms can include classical and operant conditioning, modeling, or vicarious learning. Cognitive theories, in contrast, assume that some anxiety disorder, especially panic disorder, develop through cognitive misinterpretations of anxiety and other symptoms.

73.

OBSESSIVE-COMPULSIVE AND RELATED DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Describe the main features and prevalence of obsessive-compulsive disorder, body dysmorphic disorder, and hoarding disorder
- Understand some of the factors in the development of obsessive-compulsive disorder

Obsessive-compulsive and related disorders are a group of overlapping disorders that generally involve intrusive, unpleasant thoughts and repetitive behaviors. Many of us experience unwanted thoughts from time to time (e.g., craving double cheeseburgers when dieting), and many of us engage in repetitive behaviors on occasion (e.g., pacing when nervous). However, obsessive-compulsive and related disorders elevate the unwanted thoughts and repetitive behaviors to a status so intense that these cognitions and activities disrupt daily life. Included in this category are obsessive-compulsive disorder (OCD), body dysmorphic disorder, and hoarding disorder.

Obsessive-Compulsive Disorder

People with obsessive-compulsive disorder (OCD) experience thoughts and urges that are intrusive and unwanted (obsessions) and/or the need to engage in repetitive behaviors or mental acts (compulsions). A person with this disorder might, for example, spend hours each day washing his hands or constantly checking and rechecking to make sure that a stove, faucet, or light has been turned off.

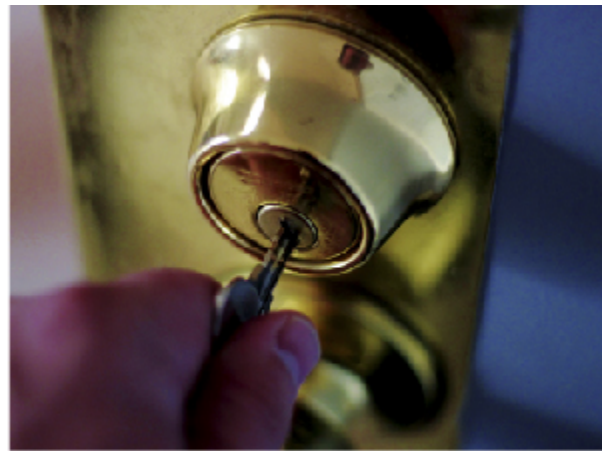
Obsessions are more than just unwanted thoughts that seem to randomly jump into our head from time

to time, such as recalling an insensitive remark a coworker made recently, and they are more significant than day-to-day worries we might have, such as justifiable concerns about being laid off from a job. Rather, obsessions are characterized as persistent, unintentional, and unwanted thoughts and urges that are highly intrusive, unpleasant, and distressing (APA, 2013). Common obsessions include concerns about germs and contamination, doubts (“Did I turn the water off?”), order and symmetry (“I need all the spoons in the tray to be arranged a certain way”), and urges that are aggressive or lustful. Usually, the person knows that such thoughts and urges are irrational and thus tries to suppress or ignore them, but has an extremely difficult time doing so. These obsessive symptoms sometimes overlap, such that someone might have both contamination and aggressive obsessions (Abramowitz & Siqueland, 2013).

Compulsions are repetitive and ritualistic acts that are typically carried out primarily as a means to minimize the distress that obsessions trigger or to reduce the likelihood of a feared event (APA, 2013). Compulsions often include such behaviors as repeated and extensive hand washing, cleaning, checking (e.g., that a door is locked), and ordering (e.g., lining up all the pencils in a particular way), and they also include such mental acts as counting, praying, or reciting something to oneself. Compulsions characteristic of OCD are not performed out of pleasure, nor are they connected in a realistic way to the source of the distress or feared event. Approximately 2.3% of the U.S. population will experience OCD in their lifetime (Ruscio, Stein, Chiu, & Kessler, 2010) and, if left untreated, OCD tends to be a chronic condition creating lifelong interpersonal and psychological problems (Norberg, Calamari, Cohen, & Riemann, 2008).



(a)



(b)

(a) Repetitive hand washing and (b) checking (e.g., that a door is locked) are common compulsions among those with obsessive-compulsive disorder. (credit a: modification of work by the USDA; credit b: modification of work by Bradley Gordon)

Body Dysmorphic Disorder

An individual with body dysmorphic disorder is preoccupied with a perceived flaw in her physical appearance that is either nonexistent or barely noticeable to other people (APA, 2013). These perceived physical defects cause the person to think she is unattractive, ugly, hideous, or deformed. These preoccupations can focus on any bodily area, but they typically involve the skin, face, or hair. The preoccupation with imagined physical flaws drives the person to engage in repetitive and ritualistic behavioral and mental acts, such as constantly looking in the mirror, trying to hide the offending body part, comparisons with others, and, in some extreme cases, cosmetic surgery (Phillips, 2005). An estimated 2.4% of the adults in the United States meet the criteria for body dysmorphic disorder, with slightly higher rates in women than in men (APA, 2013).

Hoarding Disorder

Although hoarding was traditionally considered to be a symptom of OCD, considerable evidence suggests that hoarding represents an entirely different disorder (Mataix-Cols et al., 2010). People with hoarding disorder cannot bear to part with personal possessions, regardless of how valueless or useless these possessions are. As a result, these individuals accumulate excessive amounts of usually worthless items that clutter their living areas. Often, the quantity of cluttered items is so excessive that the person is unable use his kitchen, or sleep in his bed. People who suffer from this disorder have great difficulty parting with items because they believe the items might be of some later use, or because they form a sentimental attachment to the items (APA, 2013). Importantly, a diagnosis of hoarding disorder is made only if the hoarding is not caused by another medical condition and if the hoarding is not a symptom of another disorder (e.g., schizophrenia) (APA, 2013).



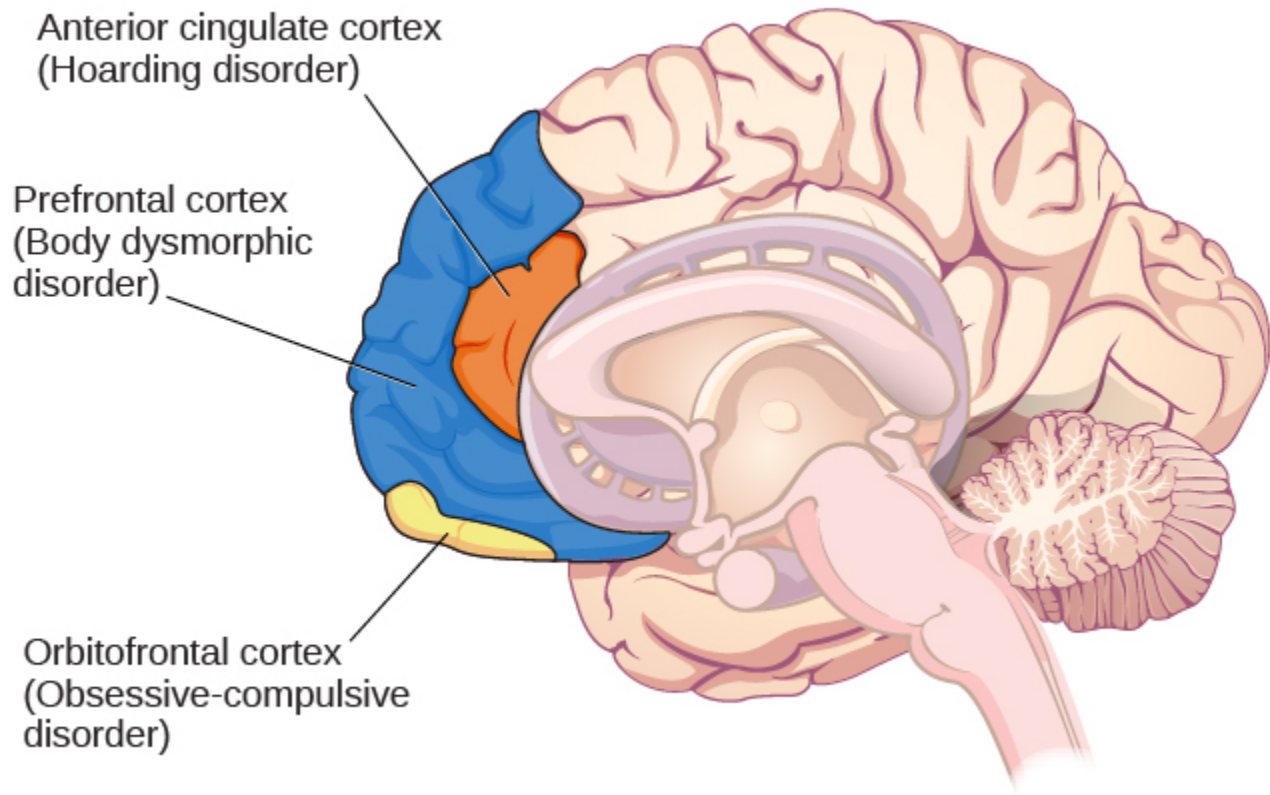
Those who suffer from hoarding disorder have great difficulty in discarding possessions, usually resulting in an accumulation of items that clutter living or work areas. (credit: "puukibeach"/Flickr)

Causes of OCD

The results of family and twin studies suggest that OCD has a moderate genetic component. The disorder is five times more frequent in the first-degree relatives of people with OCD than in people without the disorder (Nestadt et al., 2000). Additionally, the concordance rate of OCD among identical twins is around 57%; however, the concordance rate for fraternal twins is 22% (Bolton, Rijdsdijk, O'Connor, Perrin, & Eley, 2007). Studies have implicated about two dozen potential genes that may be involved in OCD; these genes regulate the function of three neurotransmitters: serotonin, dopamine, and glutamate (Pauls, 2010). Many of these studies included small sample sizes and have yet to be replicated. Thus, additional research needs to be done in this area.

A brain region that is believed to play a critical role in OCD is the orbitofrontal cortex (Kopell & Greenberg, 2008), an area of the frontal lobe involved in learning and decision-making (Rushworth, Noonan, Boorman, Walton, & Behrens, 2011). In people with OCD, the orbitofrontal cortex becomes especially hyperactive when they are provoked with tasks in which, for example, they are asked to look at a photo of a toilet or of pictures hanging crookedly on a wall (Simon, Kaufmann, Müsch, Kischkel, & Kathmann, 2010). The orbitofrontal cortex is part of a series of brain regions that, collectively, is called the OCD circuit; this circuit consists of several interconnected regions that influence the perceived emotional value of stimuli and the selection of both behavioral and cognitive responses (Graybiel & Rauch, 2000). As with the orbitofrontal cortex, other regions of the OCD circuit show heightened activity during symptom provocation (Rotge et al., 2008), which

suggests that abnormalities in these regions may produce the symptoms of OCD (Saxena, Bota, & Brody, 2001). Consistent with this explanation, people with OCD show a substantially higher degree of connectivity of the orbitofrontal cortex and other regions of the OCD circuit than do those without OCD (Beucke et al., 2013).



Different regions of the brain may be associated with different psychological disorders.

The findings discussed above were based on imaging studies, and they highlight the potential importance of brain dysfunction in OCD. However, one important limitation of these findings is the inability to explain differences in obsessions and compulsions. Another limitation is that the correlational relationship between neurological abnormalities and OCD symptoms cannot imply causation (Abramowitz & Siqueland, 2013).

Conditioning and OCD

The symptoms of OCD have been theorized to be learned responses, acquired and sustained as the result of a combination of two forms of learning: classical conditioning and operant conditioning (Mowrer, 1960; Steinmetz, Tracy, & Green, 2001). Specifically, the acquisition of OCD may occur first as the result of classical conditioning, whereby a neutral stimulus becomes associated with an unconditioned stimulus that provokes anxiety or distress. When an individual has acquired this association, subsequent encounters with the neutral

stimulus trigger anxiety, including obsessive thoughts; the anxiety and obsessive thoughts (which are now a conditioned response) may persist until she identifies some strategy to relieve it. Relief may take the form of a ritualistic behavior or mental activity that, when enacted repeatedly, reduces the anxiety. Such efforts to relieve anxiety constitute an example of negative reinforcement (a form of operant conditioning). Recall from the chapter on learning that negative reinforcement involves the strengthening of behavior through its ability to remove something unpleasant or aversive. Hence, compulsive acts observed in OCD may be sustained because they are negatively reinforcing, in the sense that they reduce anxiety triggered by a conditioned stimulus.

Suppose an individual with OCD experiences obsessive thoughts about germs, contamination, and disease whenever she encounters a doorknob. What might have constituted a viable unconditioned stimulus? Also, what would constitute the conditioned stimulus, unconditioned response, and conditioned response? What kinds of compulsive behaviors might we expect, and how do they reinforce themselves? What is decreased? Additionally, and from the standpoint of learning theory, how might the symptoms of OCD be treated successfully?

Check your understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=808#h5p-233>

Summary

Obsessive-compulsive and related disorders are a group of DSM-5 disorders that overlap somewhat in that they each involve intrusive thoughts and/or repetitive behaviors. Perhaps the most recognized of these disorders is obsessive-compulsive disorder, in which a person is obsessed with unwanted, unpleasant thoughts and/or compulsively engages in repetitive behaviors or mental acts, perhaps as a way of coping with the obsessions. Body dysmorphic disorder is characterized by the individual becoming excessively preoccupied with one or more perceived flaws in his physical appearance that are either nonexistent or unnoticeable to others. Preoccupation with the perceived physical defects causes the person to experience significant anxiety regarding

how he appears to others. Hoarding disorder is characterized by persistent difficulty in discarding or parting with objects, regardless of their actual value, often resulting in the accumulation of items that clutter and congest her living area.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=808#h5p-234>

Critical Thinking Questions

Discuss the common elements of each of the three disorders covered in this section: obsessive-compulsive disorder, body dysmorphic disorder, and hoarding disorder. Each of the three disorders is characterized by repetitive thoughts and urges, as well as an uncontrollable need to engage in repetitive behavior and mental acts. For example, repetitive thoughts include concerns over contamination (OCD), imaged physical defects (body dysmorphic disorder), and over discarding one's possessions (hoarding disorder). An uncontrollable need to engage in repetitive behaviors and mental acts include persistent hand-washing (OCD), constantly looking in the mirror (body dysmorphic disorder), and engaging in efforts to acquire new possessions (hoarding disorder).

74.

POSTTRAUMATIC STRESS DISORDER

Learning Objectives

By the end of this section, you will be able to:

- Describe the nature and symptoms of posttraumatic stress disorder
- Identify the risk factors associated with this disorder
- Understand the role of learning and cognitive factors in its development

Extremely stressful or traumatic events, such as combat, natural disasters, and terrorist attacks, place the people who experience them at an increased risk for developing psychological disorders such as posttraumatic stress disorder (PTSD). Throughout much of the 20th century, this disorder was called *shell shock* and *combat neurosis* because its symptoms were observed in soldiers who had engaged in wartime combat. By the late 1970s it had become clear that women who had experienced sexual traumas (e.g., rape, domestic battery, and incest) often experienced the same set of symptoms as did soldiers (Herman, 1997). The term *posttraumatic stress disorder* was developed given that these symptoms could happen to anyone who experienced psychological trauma.

A Broader Definition of PTSD

PTSD was listed among the anxiety disorders in previous DSM editions. In DSM-5, it is now listed among a group called Trauma-and-Stressor-Related Disorders. For a person to be diagnosed with PTSD, she must be exposed to, witness, or experience the details of a traumatic experience (e.g., a first responder), one that involves “actual or threatened death, serious injury, or sexual violence” (APA, 2013, p. 271). These experiences can include such events as combat, threatened or actual physical attack, sexual assault, natural disasters, terrorist

attacks, and automobile accidents. This criterion makes PTSD the only disorder listed in the DSM in which a cause (extreme trauma) is explicitly specified.

Symptoms of PTSD include intrusive and distressing memories of the event, flashbacks (states that can last from a few seconds to several days, during which the individual relives the event and behaves as if the event were occurring at that moment [APA, 2013]), avoidance of stimuli connected to the event, persistently negative emotional states (e.g., fear, anger, guilt, and shame), feelings of detachment from others, irritability, proneness toward outbursts, and an exaggerated startle response (jumpiness). For PTSD to be diagnosed, these symptoms must occur for at least one month.

Roughly 7% of adults in the United States, including 9.7% of women and 3.6% of men, experience PTSD in their lifetime (National Comorbidity Survey, 2007), with higher rates among people exposed to mass trauma and people whose jobs involve duty-related trauma exposure (e.g., police officers, firefighters, and emergency medical personnel) (APA, 2013). Nearly 21% of residents of areas affected by Hurricane Katrina suffered from PTSD one year following the hurricane (Kessler et al., 2008), and 12.6% of Manhattan residents were observed as having PTSD 2–3 years after the 9/11 terrorist attacks (DiGrande et al., 2008).

Risk Factors for PTSD

Of course, not everyone who experiences a traumatic event will go on to develop PTSD; several factors strongly predict the development of PTSD: trauma experience, greater trauma severity, lack of immediate social support, and more subsequent life stress (Brewin, Andrews, & Valentine, 2000). Traumatic events that involve harm by others (e.g., combat, rape, and sexual molestation) carry greater risk than do other traumas (e.g., natural disasters) (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Factors that increase the risk of PTSD include female gender, low socioeconomic status, low intelligence, personal history of mental disorders, history of childhood adversity (abuse or other trauma during childhood), and family history of mental disorders (Brewin et al., 2000). Personality characteristics such as neuroticism and somatization (the tendency to experience physical symptoms when one encounters stress) have been shown to elevate the risk of PTSD (Bramsen, Dirkzwager, & van der Ploeg, 2000). People who experience childhood adversity and/or traumatic experiences during adulthood are at significantly higher risk of developing PTSD if they possess one or two short versions of a gene that regulates the neurotransmitter serotonin (Xie et al., 2009). This suggests a possible diathesis-stress interpretation of PTSD: its development is influenced by the interaction of psychosocial and biological factors.

Support for Sufferers of PTSD

Research has shown that social support following a traumatic event can reduce the likelihood of PTSD (Ozer, Best, Lipsey, & Weiss, 2003). Social support is often defined as the comfort, advice, and assistance received from

relatives, friends, and neighbors. Social support can help individuals cope during difficult times by allowing them to discuss feelings and experiences and providing a sense of being loved and appreciated. A 14-year study of 1,377 American Legionnaires who had served in the Vietnam War found that those who perceived less social support when they came home were more likely to develop PTSD than were those who perceived greater support. In addition, those who became involved in the community were less likely to develop PTSD, and they were more likely to experience a remission of PTSD than were those who were less involved (Koenen, Stellman, Stellman, & Sommer, 2003).



PTSD was first recognized in soldiers who had engaged in combat. Research has shown that strong social support decreases the risk of PTSD. This person stands at the Vietnam Traveling Memorial Wall. (credit: Kevin Stanchfield)

Learning and the Development of PTSD

PTSD learning models suggest that some symptoms are developed and maintained through classical conditioning. The traumatic event may act as an unconditioned stimulus that elicits an unconditioned response characterized by extreme fear and anxiety. Cognitive, emotional, physiological, and environmental cues accompanying or related to the event are conditioned stimuli. These traumatic reminders evoke conditioned responses (extreme fear and anxiety) similar to those caused by the event itself (Nader, 2001). A person who was in the vicinity of the Twin Towers during the 9/11 terrorist attacks and who developed PTSD may display excessive hypervigilance and distress when planes fly overhead; this behavior constitutes a conditioned response to the traumatic reminder (conditioned stimulus of the sight and sound of an airplane). Differences in how conditionable individuals are help to explain differences in the development and maintenance of PTSD symptoms (Pittman, 1988). Conditioning studies demonstrate facilitated acquisition of conditioned responses and delayed extinction of conditioned responses in people with PTSD (Orr et al., 2000).

Cognitive factors are important in the development and maintenance of PTSD. One model suggests that two key processes are crucial: disturbances in memory for the event, and negative appraisals of the trauma and its aftermath (Ehlers & Clark, 2000). According to this theory, some people who experience traumas do not form coherent memories of the trauma; memories of the traumatic event are poorly encoded and, thus, are fragmented, disorganized, and lacking in detail. Therefore, these individuals are unable remember the event in a way that gives it meaning and context. A rape victim who cannot coherently remember the event may remember only bits and pieces (e.g., the attacker repeatedly telling her she is stupid); because she was unable to develop a fully integrated memory, the fragmentary memory tends to stand out. Although unable to retrieve a complete memory of the event, she may be haunted by intrusive fragments involuntarily triggered by stimuli associated with the event (e.g., memories of the attacker's comments when encountering a person who resembles the attacker). This interpretation fits previously discussed material concerning PTSD and conditioning. The model also proposes that negative appraisals of the event ("I deserved to be raped because I'm stupid") may lead to dysfunctional behavioral strategies (e.g., avoiding social activities where men are likely to be present) that maintain PTSD symptoms by preventing both a change in the nature of the memory and a change in the problematic appraisals.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=810#h5p-236>

Summary

Posttraumatic stress disorder (PTSD) was described through much of the 20th century and was referred to as shell shock and combat neurosis in the belief that its symptoms were thought to emerge from the stress of active combat. Today, PTSD is defined as a disorder in which the experience of a traumatic or profoundly stressful event, such as combat, sexual assault, or natural disaster, produces a constellation of symptoms that must last for one month or more. These symptoms include intrusive and distressing memories of the event, flashbacks, avoidance of stimuli or situations that are connected to the event, persistently negative emotional states, feeling detached from others, irritability, proneness toward outbursts, and a tendency to be easily startled. Not everyone who experiences a traumatic event will develop PTSD; a variety of risk factors associated with its development have been identified.

Review Questions

A small, solid black horizontal line.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=810#h5p-237>

Critical Thinking Question

List some of the risk factors associated with the development of PTSD following a traumatic event.

Risk factors associated with PTSD include gender (female), low socioeconomic status, low intelligence, personal and family history of mental illness, and childhood abuse or trauma. Personality factors, including neuroticism and somatization, may also serve as risk factors. Also, certain versions of a gene that regulates serotonin may constitute a diathesis.

75.

MOOD DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Distinguish normal states of sadness and euphoria from states of depression and mania
- Describe the symptoms of major depressive disorder and bipolar disorder
- Understand the differences between major depressive disorder and persistent depressive disorder, and identify two subtypes of depression
- Define the criteria for a manic episode
- Understand genetic, biological, and psychological explanations of major depressive disorder
- Discuss the relationship between mood disorders and suicidal ideation, as well as factors associated with suicide

Blake cries all day and feeling that he is worthless and his life is hopeless, he cannot get out of bed. Crystal stays up all night, talks very rapidly, and went on a shopping spree in which she spent \$3,000 on furniture, although she cannot afford it. Maria recently had a baby, and she feels overwhelmed, teary, anxious, and panicked, and believes she is a terrible mother—practically every day since the baby was born. All these individuals demonstrate symptoms of a potential mood disorder.

Mood disorders are characterized by severe disturbances in mood and emotions—most often depression, but also mania and elation (Rothschild, 1999). All of us experience fluctuations in our moods and emotional states, and often these fluctuations are caused by events in our lives. We become elated if our favorite team wins the World Series and dejected if a romantic relationship ends or if we lose our job. At times, we feel fantastic or miserable for no clear reason. People with mood disorders also experience mood fluctuations, but their fluctuations are extreme, distort their outlook on life, and impair their ability to function.



Mood disorders are characterized by massive disruptions in mood. Symptoms can range from the extreme sadness and hopelessness of depression to the extreme elation and irritability of mania. (credit: Kiran Foster)

The DSM-5 lists two general categories of mood disorders. Depressive disorders are a group of disorders in which depression is the main feature. Depression is a vague term that, in everyday language, refers to an intense and persistent sadness. Depression is a heterogeneous mood state—it consists of a broad spectrum of symptoms that range in severity. Depressed people feel sad, discouraged, and hopeless. These individuals lose interest in activities once enjoyed, often experience a decrease in drives such as hunger and sex, and frequently doubt personal worth. Depressive disorders vary by degree, but this chapter highlights the most well-known: major depressive disorder (sometimes called unipolar depression).

Bipolar and related disorders are a group of disorders in which mania is the defining feature. Mania is a state of extreme elation and agitation. When people experience mania, they may become extremely talkative, behave recklessly, or attempt to take on many tasks simultaneously. The most recognized of these disorders is bipolar disorder.

Major Depressive Disorder

According to the DSM-5, the defining symptoms of major depressive disorder include “depressed mood most of the day, nearly every day” (feeling sad, empty, hopeless, or appearing tearful to others), and loss of interest and pleasure in usual activities (APA, 2013). In addition to feeling overwhelmingly sad most of each day, people with depression will no longer show interest or enjoyment in activities that previously were gratifying, such as hobbies, sports, sex, social events, time spent with family, and so on. Friends and family members may notice that the person has completely abandoned previously enjoyed hobbies; for example, an avid tennis player who develops major depressive disorder no longer plays tennis (Rothschild, 1999).

To receive a diagnosis of major depressive disorder, one must experience a total of five symptoms for at least a two-week period; these symptoms must cause significant distress or impair normal functioning, and they must not be caused by substances or a medical condition. At least one of the two symptoms mentioned above must be present, plus any combination of the following symptoms (APA, 2013):

- significant weight loss (when not dieting) or weight gain and/or significant decrease or increase in appetite;
- difficulty falling asleep or sleeping too much;
- psychomotor agitation (the person is noticeably fidgety and jittery, demonstrated by behaviors like the inability to sit, pacing, hand-wringing, pulling or rubbing of the skin, clothing, or other objects) or psychomotor retardation (the person talks and moves slowly, for example, talking softly, very little, or in a monotone);
- fatigue or loss of energy;
- feelings of worthlessness or guilt;
- difficulty concentrating and indecisiveness; and
- suicidal ideation: thoughts of death (not just fear of dying), thinking about or planning suicide, or making an actual suicide attempt.

Major depressive disorder is considered episodic: its symptoms are typically present at their full magnitude for a certain period of time and then gradually abate. Approximately 50%–60% of people who experience an episode of major depressive disorder will have a second episode at some point in the future; those who have had two episodes have a 70% chance of having a third episode, and those who have had three episodes have a 90% chance of having a fourth episode (Rothschild, 1999). Although the episodes can last for months, a majority of people diagnosed with this condition (around 70%) recover within a year. However, a substantial number do not recover; around 12% show serious signs of impairment associated with major depressive disorder after 5 years (Boland & Keller, 2009). In the long-term, many who do recover will still show minor symptoms that fluctuate in their severity (Judd, 2012).

Results of Major Depressive Disorder

Major depressive disorder is a serious and incapacitating condition that can have a devastating effect on the quality of one's life. The person suffering from this disorder lives a profoundly miserable existence that often results in unavailability for work or education, abandonment of promising careers, and lost wages; occasionally, the condition requires hospitalization. The majority of those with major depressive disorder report having faced some kind of discrimination, and many report that having received such treatment has stopped them from initiating close relationships, applying for jobs for which they are qualified, and applying for education or training (Lasalvia et al., 2013). Major depressive disorder also takes a toll on health. Depression is a risk factor for the development of heart disease in healthy patients, as well as adverse cardiovascular outcomes in patients with preexisting heart disease (Whooley, 2006).

Risk Factors for Major Depressive Disorder

Major depressive disorder is often referred to as the common cold of psychiatric disorders. Around 6.6% of the U.S. population experiences major depressive disorder each year; 16.9% will experience the disorder during their lifetime (Kessler & Wang, 2009). It is more common among women than among men, affecting approximately 20% of women and 13% of men at some point in their life (National Comorbidity Survey, 2007). The greater risk among women is not accounted for by a tendency to report symptoms or to seek help more readily, suggesting that gender differences in the rates of major depressive disorder may reflect biological and gender-related environmental experiences (Kessler, 2003).

Lifetime rates of major depressive disorder tend to be highest in North and South America, Europe, and Australia; they are considerably lower in Asian countries (Hasin, Fenton, & Weissman, 2011). The rates of major depressive disorder are higher among younger age cohorts than among older cohorts, perhaps because people in younger age cohorts are more willing to admit depression (Kessler & Wang, 2009).

A number of risk factors are associated with major depressive disorder: unemployment (including homemakers); earning less than \$20,000 per year; living in urban areas; or being separated, divorced, or widowed (Hasin et al., 2011). Comorbid disorders include anxiety disorders and substance abuse disorders (Kessler & Wang, 2009).

Subtypes of Depression

The DSM-5 lists several different subtypes of depression. These subtypes—what the DSM-5 refer to as specifiers—are not specific disorders; rather, they are labels used to indicate specific patterns of symptoms or to specify certain periods of time in which the symptoms may be present. One subtype, seasonal pattern, applies

to situations in which a person experiences the symptoms of major depressive disorder only during a particular time of year (e.g., fall or winter). In everyday language, people often refer to this subtype as the winter blues.

Another subtype, peripartum onset (commonly referred to as postpartum depression), applies to women who experience major depression during pregnancy or in the four weeks following the birth of their child (APA, 2013). These women often feel very anxious and may even have panic attacks. They may feel guilty, agitated, and be weepy. They may not want to hold or care for their newborn, even in cases in which the pregnancy was desired and intended. In extreme cases, the mother may have feelings of wanting to harm her child or herself. In a horrific illustration, a woman named Andrea Yates, who suffered from extreme peripartum-onset depression (as well as other mental illnesses), drowned her five children in a bathtub (Roche, 2002). Most women with peripartum-onset depression do not physically harm their children, but most do have difficulty being adequate caregivers (Fields, 2010). A surprisingly high number of women experience symptoms of peripartum-onset depression. A study of 10,000 women who had recently given birth found that 14% screened positive for peripartum-onset depression, and that nearly 20% reported having thoughts of wanting to harm themselves (Wisner et al., 2013).

People with persistent depressive disorder (previously known as dysthymia) experience depressed moods most of the day nearly every day for at least two years, as well as at least two of the other symptoms of major depressive disorder. People with persistent depressive disorder are chronically sad and melancholy, but do not meet all the criteria for major depression. However, episodes of full-blown major depressive disorder can occur during persistent depressive disorder (APA, 2013).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=812#h5p-239>

Bipolar Disorder

A person with bipolar disorder (commonly known as manic depression) often experiences mood states that

vacillate between depression and mania; that is, the person's mood is said to alternate from one emotional extreme to the other (in contrast to unipolar, which indicates a persistently sad mood).

To be diagnosed with bipolar disorder, a person must have experienced a manic episode at least once in his life; although major depressive episodes are common in bipolar disorder, they are not required for a diagnosis (APA, 2013). According to the DSM-5, a manic episode is characterized as a “distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased activity or energy lasting at least one week,” that lasts most of the time each day (APA, 2013, p. 124). During a manic episode, some experience a mood that is almost euphoric and become excessively talkative, sometimes spontaneously starting conversations with strangers; others become excessively irritable and complain or make hostile comments. The person may talk loudly and rapidly, exhibiting flight of ideas, abruptly switching from one topic to another. These individuals are easily distracted, which can make a conversation very difficult. They may exhibit grandiosity, in which they experience inflated but unjustified self-esteem and self-confidence. For example, they might quit a job in order to “strike it rich” in the stock market, despite lacking the knowledge, experience, and capital for such an endeavor. They may take on several tasks at the same time (e.g., several time-consuming projects at work) and yet show little, if any, need for sleep; some may go for days without sleep. Patients may also recklessly engage in pleasurable activities that could have harmful consequences, including spending sprees, reckless driving, making foolish investments, excessive gambling, or engaging in sexual encounters with strangers (APA, 2013).

During a manic episode, individuals usually feel as though they are not ill and do not need treatment. However, the reckless behaviors that often accompany these episodes—which can be antisocial, illegal, or physically threatening to others—may require involuntary hospitalization (APA, 2013). Some patients with bipolar disorder will experience a rapid-cycling subtype, which is characterized by at least four manic episodes (or some combination of at least four manic and major depressive episodes) within one year.

In the 1997 independent film *Sweetheart*, actress Janeane Garofalo plays the part of Jasmine, a young woman with bipolar disorder. Watch this video to see a portion of this film in which Jasmine experiences a manic episode: [The Other Side of Me – inside my bipolar mind](https://louis.pressbooks.pub/intropsychology/?p=812#oembed-1).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=812#oembed-1>

Risk Factors for Bipolar Disorder

Bipolar disorder is considerably less frequent than major depressive disorder. In the United States, 1 out of every 167 people meets the criteria for bipolar disorder each year, and 1 out of 100 meet the criteria within their lifetime (Merikangas et al., 2011). The rates are higher in men than in women, and about half of those with this disorder report onset before the age of 25 (Merikangas et al., 2011). Around 90% of those with bipolar disorder have a comorbid disorder, most often an anxiety disorder or a substance abuse problem. Unfortunately, close to half of the people suffering from bipolar disorder do not receive treatment (Merikangas & Tohen, 2011). Suicide rates are extremely high among those with bipolar disorder: around 36% of individuals with this disorder attempt suicide at least once in their lifetime (Novick, Swartz, & Frank, 2010), and between 15%–19% complete suicide (Newman, 2004).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

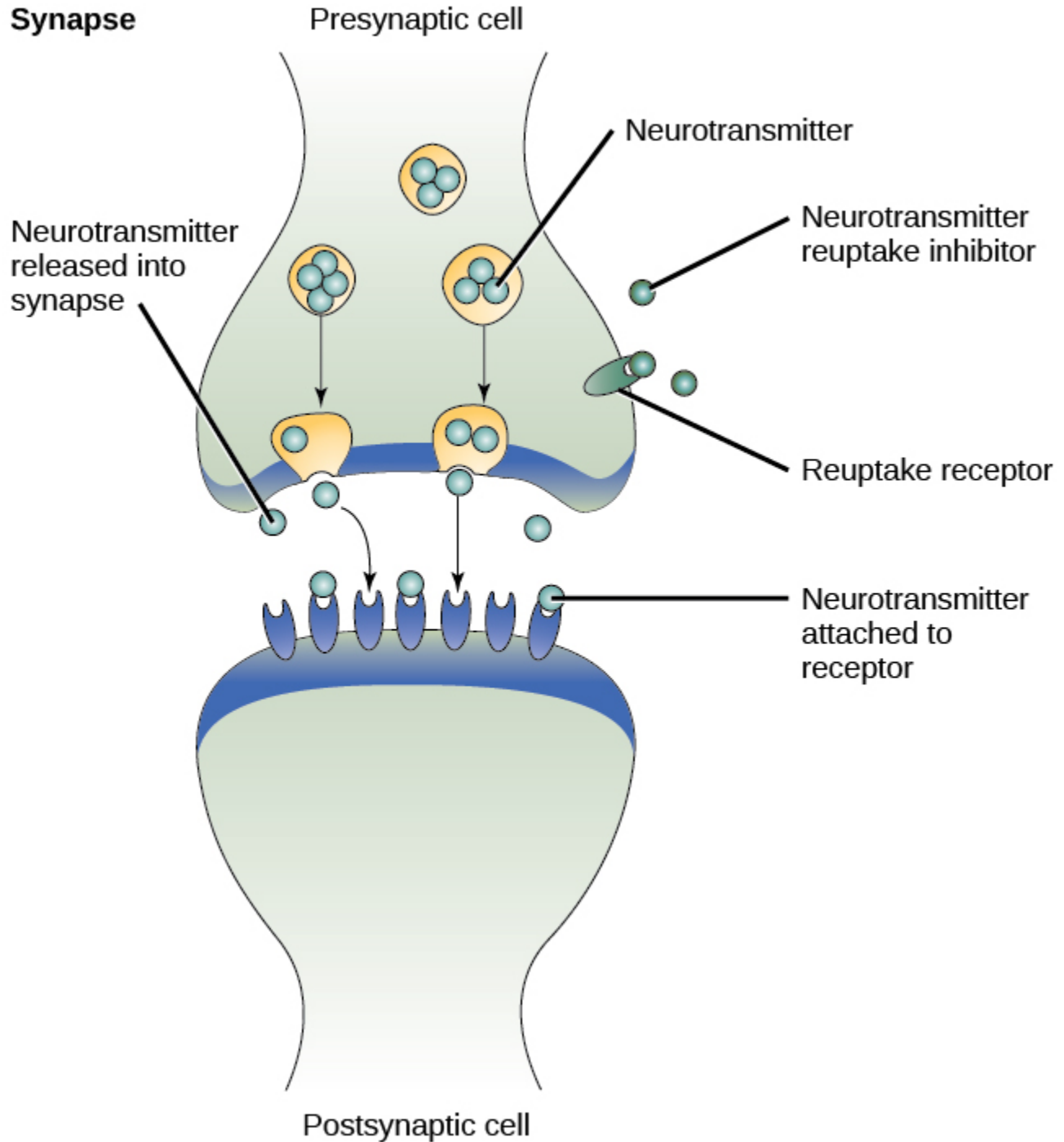
<https://louis.pressbooks.pub/intropsychology/?p=812#h5p-240>

The Biological Basis of Mood Disorders

Mood disorders have been shown to have a strong genetic and biological basis. Relatives of those with major depressive disorder have double the risk of developing major depressive disorder, whereas relatives of patients with bipolar disorder have over nine times the risk (Merikangas et al., 2011). The rate of concordance for major depressive disorder is higher among identical twins than fraternal twins (50% vs. 38%, respectively), as is that of bipolar disorder (67% vs. 16%, respectively), suggesting that genetic factors play a stronger role in bipolar disorder than in major depressive disorder (Merikangas et al. 2011).

People with mood disorders often have imbalances in certain neurotransmitters, particularly norepinephrine and serotonin (Thase, 2009). These neurotransmitters are important regulators of the bodily functions that are disrupted in mood disorders, including appetite, sex drive, sleep, arousal, and mood. Medications that

are used to treat major depressive disorder typically boost serotonin and norepinephrine activity, whereas lithium—used in the treatment of bipolar disorder—blocks norepinephrine activity at the synapses.



Many medications designed to treat mood disorders work by altering neurotransmitter activity in the neural synapse.

Depression is linked to abnormal activity in several regions of the brain (Fitzgerald, Laird, Maller, & Daskalakis, 2008) including those important in assessing the emotional significance of stimuli and

experiencing emotions (amygdala), and in regulating and controlling emotions (like the prefrontal cortex, or PFC) (LeMoult, Castonguay, Joormann, & McAleavey, 2013). Depressed individuals show elevated amygdala activity (Drevets, Bogers, & Raichle, 2002), especially when presented with negative emotional stimuli, such as photos of sad faces (Surguladze et al., 2005). Interestingly, heightened amygdala activation to negative emotional stimuli among depressed persons occurs even when stimuli are presented outside of conscious awareness (Victor, Furey, Fromm, Öhman, & Drevets, 2010), and it persists even after the negative emotional stimuli are no longer present (Siegle, Thompson, Carter, Steinhauer, & Thase, 2007). Additionally, depressed individuals exhibit less activation in the prefrontal, particularly on the left side (Davidson, Pizzagalli, & Nitschke, 2009). Because the PFC can dampen amygdala activation, thereby enabling one to suppress negative emotions (Phan et al., 2005), decreased activation in certain regions of the PFC may inhibit its ability to override negative emotions that might then lead to more negative mood states (Davidson et al., 2009). These findings suggest that depressed persons are more prone to react to emotionally negative stimuli, yet have greater difficulty controlling these reactions.



Depressed individuals react to negative emotional stimuli, such as sad faces, with greater amygdala activation than do non-depressed individuals.
(credit: Ian Munroe)

Since the 1950s, researchers have noted that depressed individuals have abnormal levels of cortisol, a stress hormone released into the blood by the neuroendocrine system during times of stress (Mackin & Young, 2004). When cortisol is released, the body initiates a fight-or-flight response in reaction to a threat or danger. Many people with depression show elevated cortisol levels (Holsboer & Ising, 2010), especially those reporting a history of early life trauma such as the loss of a parent or abuse during childhood (Baes, Tofoli, Martins, & Juruena, 2012). Such findings raise the question of whether high cortisol levels are a cause or a consequence of depression. High levels of cortisol are a risk factor for future depression (Halligan, Herbert, Goodyer, & Murray, 2007), and cortisol activates activity in the amygdala while deactivating activity in the PFC (McEwen, 2005)—both brain disturbances are connected to depression. Thus, high cortisol levels may have a causal effect on depression, as well as on its brain function abnormalities (van Praag, 2005). Also, because stress results in

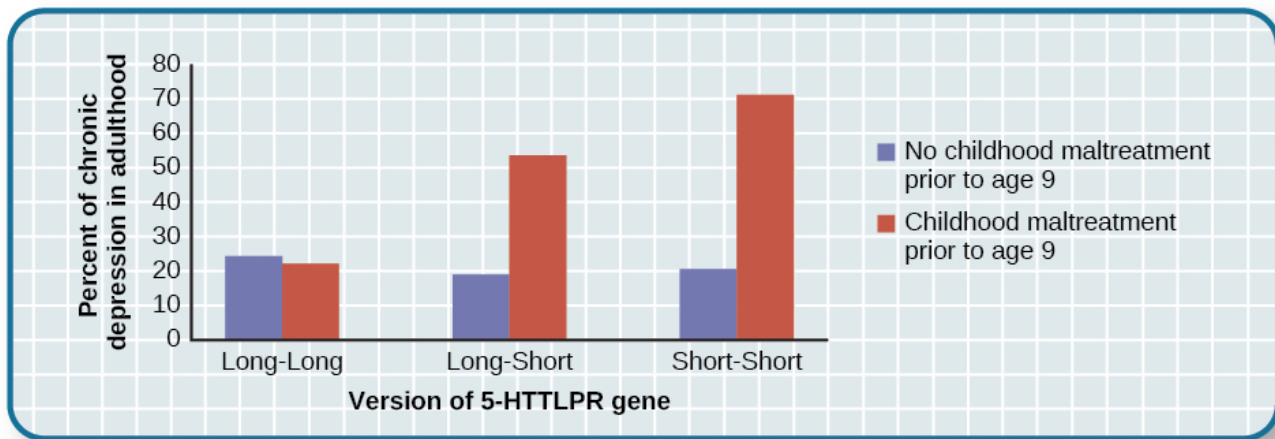
increased cortisol release (Michaud, Matheson, Kelly, Anisman, 2008), it is equally reasonable to assume that stress may precipitate depression.

A Diathesis-Stress Model and Major Depressive Disorders

Indeed, it has long been believed that stressful life events can trigger depression, and research has consistently supported this conclusion (Mazure, 1998). Stressful life events include significant losses, such as the death of a loved one, divorce or separation, and serious health and money problems; life events such as these often precede the onset of depressive episodes (Brown & Harris, 1989). In particular, exit events—instances in which an important person departs (e.g., a death, divorce or separation, or a family member leaving home)—often occur prior to an episode (Paykel, 2003). Exit events are especially likely to trigger depression if these happenings occur in a way that humiliates or devalues the individual. For example, people who experience the breakup of a relationship initiated by the other person develop major depressive disorder at a rate more than 2 times that of people who experience the death of a loved one (Kendler, Hettema, Butera, Gardner, & Prescott, 2003).

Likewise, individuals who are exposed to traumatic stress during childhood—such as separation from a parent, family turmoil, and maltreatment (physical or sexual abuse)—are at a heightened risk of developing depression at any point in their lives (Kessler, 1997). A recent review of 16 studies involving over 23,000 subjects concluded that those who experience childhood maltreatment are more than 2 times as likely to develop recurring and persistent depression (Nanni, Uher, & Danese, 2012).

Of course, not everyone who experiences stressful life events or childhood adversities succumbs to depression—indeed, most do not. Clearly, a diathesis-stress interpretation of major depressive disorder, in which certain predispositions or vulnerability factors influence one's reaction to stress, would seem logical. If so, what might such predispositions be? A study by Caspi and others (2003) suggests that an alteration in a specific gene that regulates serotonin (the 5-HTTLPR gene) might be one culprit. These investigators found that people who experienced several stressful life events were significantly more likely to experience episodes of major depression if they carried one or two short versions of this gene than if they carried two long versions. Those who carried one or two short versions of the 5-HTTLPR gene were unlikely to experience an episode, however, if they had experienced few or no stressful life events. Numerous studies have replicated these findings, including studies of people who experienced maltreatment during childhood (Goodman & Brand, 2009). In a recent investigation conducted in the United Kingdom (Brown & Harris, 2013), researchers found that childhood maltreatment before age 9 elevated the risk of chronic adult depression (a depression episode lasting for at least 12 months) among those individuals having one (LS) or two (SS) short versions of the 5-HTTLPR gene. Childhood maltreatment did not increase the risk for chronic depression for those having two long (LL) versions of this gene. Thus, genetic vulnerability may be one mechanism through which stress potentially leads to depression.



A study on gene-environment interaction in people experiencing chronic depression in adulthood suggests a much higher incidence in individuals with a short version of the gene in combination with childhood maltreatment (Brown & Harris, 2013).

Cognitive Theories of Depression

Cognitive theories of depression take the view that depression is triggered by negative thoughts, interpretations, self-evaluations, and expectations (Joormann, 2009). These diathesis-stress models propose that depression is triggered by a “cognitive vulnerability” (negative and maladaptive thinking) and by precipitating stressful life events (Gotlib & Joormann, 2010). Perhaps the most well-known cognitive theory of depression was developed in the 1960s by psychiatrist Aaron Beck, based on clinical observations and supported by research (Beck, 2008). Beck theorized that depression-prone people possess depressive schemas, or mental predispositions to think about most things in a negative way (Beck, 1976). Depressive schemas contain themes of loss, failure, rejection, worthlessness, and inadequacy, and may develop early in childhood in response to adverse experiences, then remain dormant until they are activated by stressful or negative life events. Depressive schemas prompt dysfunctional and pessimistic thoughts about the self, the world, and the future. Beck believed that this dysfunctional style of thinking is maintained by cognitive biases, or errors in how we process information about ourselves, which lead us to focus on negative aspects of experiences, interpret things negatively, and block positive memories (Beck, 2008). A person whose depressive schema consists of a theme of rejection might be overly attentive to social cues of rejection (more likely to notice another’s frown), and he might interpret this cue as a sign of rejection and automatically remember past incidents of rejection. Longitudinal studies have supported Beck’s theory, in showing that a preexisting tendency to engage in this negative, self-defeating style of thinking—when combined with life stress—over time predicts the onset of depression (Dozois & Beck, 2008). Cognitive therapies for depression, aimed at changing a depressed person’s negative thinking, were developed as an expansion of this theory (Beck, 1976).

Another cognitive theory of depression, hopelessness theory, postulates that a particular style of negative

thinking leads to a sense of hopelessness, which then leads to depression (Abramson, Metalsky, & Alloy, 1989). According to this theory, hopelessness is an expectation that unpleasant outcomes will occur or that desired outcomes will not occur, and there is nothing one can do to prevent such outcomes. A key assumption of this theory is that hopelessness stems from a tendency to perceive negative life events as having stable (“It’s never going to change”) and global (“It’s going to affect my whole life”) causes, in contrast to unstable (“It’s fixable”) and specific (“It applies only to this particular situation”) causes, especially if these negative life events occur in important life realms, such as relationships, academic achievement, and the like. Suppose a student who wishes to go to law school does poorly on an admissions test. If the student infers negative life events as having stable and global causes, she may believe that her poor performance has a stable and global cause (“I lack intelligence, and it’s going to prevent me from ever finding a meaningful career”), as opposed to an unstable and specific cause (“I was sick the day of the exam, so my low score was a fluke”). Hopelessness theory predicts that people who exhibit this cognitive style in response to undesirable life events will view such events as having negative implications for their future and self-worth, thereby increasing the likelihood of hopelessness—the primary cause of depression (Abramson et al., 1989). One study testing hopelessness theory measured the tendency to make negative inferences for bad life effects in participants who were experiencing uncontrollable stressors. Over the ensuing six months, those with scores reflecting high cognitive vulnerability were 7 times more likely to develop depression compared to those with lower scores (Kleim, Gonzalo, & Ehlers, 2011).

A third cognitive theory of depression focuses on how people’s thoughts about their distressed moods—depressed symptoms in particular—can increase the risk and duration of depression. This theory, which focuses on rumination in the development of depression, was first described in the late 1980s to explain the higher rates of depression in women than in men (Nolen-Hoeksema, 1987). Rumination is the repetitive and passive focus on the fact that one is depressed and dwelling on depressed symptoms, rather than distracting one’s self from the symptoms or attempting to address them in an active, problem-solving manner (Nolen-Hoeksema, 1991). When people ruminate, they have thoughts such as “Why am I so unmotivated? I just can’t get going. I’m never going to get my work done feeling this way” (Nolen-Hoeksema & Hilt, 2009, p. 393). Women are more likely than men to ruminate when they are sad or depressed (Butler & Nolen-Hoeksema, 1994), and the tendency to ruminate is associated with increases in depression symptoms (Nolen-Hoeksema, Larson, & Grayson, 1999), heightened risk of major depressive episodes (Abela & Hankin, 2011), and chronicity of such episodes (Robinson & Alloy, 2003).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=812#h5p-241>

Suicide

For some people with mood disorders, the extreme emotional pain they experience becomes unendurable. Overwhelmed by hopelessness, devastated by incapacitating feelings of worthlessness, and burdened with the inability to adequately cope with such feelings, they may consider suicide to be a reasonable way out. Suicide, defined by the CDC as “death caused by self-directed injurious behavior with any intent to die as the result of the behavior” (CDC, 2013a), in a sense represents an outcome of several things going wrong all at the same time (Crosby, Ortega, & Melanson, 2011). Not only must the person be biologically or psychologically vulnerable, but he must also have the means to perform the suicidal act, and he must lack the necessary protective factors (e.g., social support from friends and family, religion, coping skills, and problem-solving skills) that provide comfort and enable one to cope during times of crisis or great psychological pain (Berman, 2009).

Suicide is not listed as a disorder in the DSM-5; however, suffering from a mental disorder—especially a mood disorder—poses the greatest risk for suicide. Around 90% of those who complete suicides have a diagnosis of at least one mental disorder, with mood disorders being the most frequent (Fleischman, Bertolote, Belfer, & Beautrais, 2005). In fact, the association between major depressive disorder and suicide is so strong that one of the criteria for the disorder is thoughts of suicide, as discussed above (APA, 2013).

Suicide rates can be difficult to interpret because some deaths that appear to be accidental may in fact be acts of suicide (e.g., automobile crash). Nevertheless, investigations into U.S. suicide rates have uncovered these facts:

- Suicide was the 10th leading cause of death for all ages in 2010 (Centers for Disease Control and Prevention [CDC], 2012).

- There were 38,364 suicides in 2010 in the United States—an average of 105 each day (CDC, 2012).
- Suicide among males is 4 times higher than among females and accounts for 79% of all suicides; firearms are the most commonly used method of suicide for males, whereas poisoning is the most commonly used method for females (CDC, 2012).
- From 1991 to 2003, suicide rates were consistently higher among those 65 years and older. Since 2001, however, suicide rates among those ages 25–64 have risen consistently, and, since 2006, suicide rates have been greater for those ages 65 and older (CDC, 2013b). This increase in suicide rates among middle-aged Americans has prompted concern in some quarters that baby boomers (individuals born between 1946–1964) who face economic worry and easy access to prescription medication may be particularly vulnerable to suicide (Parker-Pope, 2013).
- The highest rates of suicide within the United States are among American Indians/Alaskan natives and Non-Hispanic Whites (CDC, 2013b).
- Suicide rates vary across the United States, with the highest rates consistently found in the mountain states of the west (Alaska, Montana, Nevada, Wyoming, Colorado, and Idaho) (Berman, 2009).

Contrary to popular belief, suicide rates peak during the springtime (April and May), not during the holiday season or winter. In fact, suicide rates are generally lowest during the winter months (Postolache et al., 2010).

Risk Factors for Suicide

Suicidal risk is especially high among people with substance abuse problems. Individuals with alcohol dependence are at 10 times greater risk for suicide than the general population (Wilcox, Conner, & Caine, 2004). The risk of suicidal behavior is especially high among those who have made a prior suicide attempt. Among those who attempt suicide, 16% make another attempt within a year and over 21% make another attempt within four years (Owens, Horrocks, & House, 2002). Suicidal individuals may be at high risk for terminating their life if they have a lethal means in which to act, such as a firearm in the home (Brent & Bridge, 2003). Withdrawal from social relationships, feeling as though one is a burden to others, and engaging in reckless and risk-taking behaviors may be precursors to suicidal behavior (Berman, 2009). A sense of entrapment or feeling unable to escape one's miserable feelings or external circumstances (e.g., an abusive relationship with no perceived way out) predicts suicidal behavior (O'Connor, Smyth, Ferguson, Ryan, & Williams, 2013). Tragically, reports of suicides among adolescents following instances of cyberbullying have emerged in recent years. In one widely-publicized case a few years ago, Phoebe Prince, a 15-year-old Massachusetts high school student, committed suicide following incessant harassment and taunting from her classmates via texting and Facebook (McCabe, 2010).

Suicides can have a contagious effect on people. For example, another's suicide, especially that of a family member, heightens one's risk of suicide (Agerbo, Nordentoft, & Mortensen, 2002). Additionally, widely-

publicized suicides tend to trigger copycat suicides in some individuals. One study examining suicide statistics in the United States from 1947–1967 found that the rates of suicide skyrocketed for the first month after a suicide story was printed on the front page of the *New York Times* (Phillips, 1974). Austrian researchers found a significant increase in the number of suicides by firearms in the three weeks following extensive reports in Austria’s largest newspaper of a celebrity suicide by gun (Etzersdorfer, Voracek, & Sonneck, 2004). A review of 42 studies concluded that media coverage of celebrity suicides is more than 14 times more likely to trigger copycat suicides than is coverage of non-celebrity suicides (Stack, 2000). This review also demonstrated that the medium of coverage is important: televised stories are considerably less likely to prompt a surge in suicides than are newspaper stories. Research suggests that a trend appears to be emerging whereby people use online social media to leave suicide notes, although it is not clear to what extent suicide notes on such media might induce copycat suicides (Ruder, Hatch, Ampanozi, Thali, & Fischer, 2011). Nevertheless, it is reasonable to conjecture that suicide notes left by individuals on social media may influence the decisions of other vulnerable people who encounter them (Luxton, June, & Fairall, 2012).

One possible contributing factor in suicide is brain chemistry. Contemporary neurological research shows that disturbances in the functioning of serotonin are linked to suicidal behavior (Pompili et al., 2010). Low levels of serotonin predict future suicide attempts and suicide completions, and low levels have been observed post-mortem among suicide victims (Mann, 2003). Serotonin dysfunction, as noted earlier, is also known to play an important role in depression; low levels of serotonin have also been linked to aggression and impulsivity (Stanley et al., 2000). The combination of these three characteristics constitutes a potential formula for suicide—especially violent suicide. A classic study conducted during the 1970s found that patients with major depressive disorder who had very low levels of serotonin attempted suicide more frequently and more violently than did patients with higher levels (Asberg, Thorén, Träskman, Bertilsson, & Ringberger, 1976; Mann, 2003).

Suicidal thoughts, plans, and even off-hand remarks (“I might kill myself this afternoon”) should always be taken extremely seriously. People who contemplate terminating their life need immediate help. Below are links to two excellent websites that contain resources (including hotlines) for people who are struggling with suicidal ideation, have loved ones who may be suicidal, or who have lost loved ones to suicide: <http://www.afsp.org> and <http://suicidology.org>.

Summary

Mood disorders are those in which the person experiences severe disturbances in mood and emotion. They include depressive disorders and bipolar and related disorders. Depressive disorders include major depressive disorder, which is characterized by episodes of profound sadness and loss of interest or pleasure in usual activities and other associated features, and persistent depressive disorder, which is marked by a chronic state of sadness. Bipolar disorder is characterized by mood states that vacillate between sadness and euphoria; a diagnosis of bipolar disorder requires experiencing at least one manic episode, which is defined as a period

of extreme euphoria, irritability, and increased activity. Mood disorders appear to have a genetic component, with genetic factors playing a more prominent role in bipolar disorder than in depression. Both biological and psychological factors are important in the development of depression. People who suffer from mental health problems, especially mood disorders, are at heightened risk for suicide.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=812#h5p-242>

Critical Thinking Question

Describe several of the factors associated with suicide.

The risk of suicide is high among people with mental health problems, including mood disorders and substance abuse problems. The risk is also high among those who have made a prior suicide attempt and who have lethal means to commit suicide. Rates of suicide are higher among men and during the springtime, and they are higher in the mountain states of the west than in other regions of the United States. Research has also shown that suicides can have a “contagious” effect on people, and that it is associated with serotonin dysfunction.

Personal Application Question

Think of someone you know who seems to have a tendency to make negative, self-defeating explanations for

negative life events. How might this tendency lead to future problems? What steps do you think could be taken to change this thinking style?

Media Attributions

- “[The Other Side of Me – inside my bipolar mind](#)” by [Julie Kraft](#). Standard YouTube License.

76.

SCHIZOPHRENIA

Learning Objectives

By the end of this section, you will be able to:

- Recognize the essential nature of schizophrenia, avoiding the misconception that it involves a split personality
- Categorize and describe the major symptoms of schizophrenia
- Understand the interplay between genetic, biological, and environmental factors that are associated with the development of schizophrenia
- Discuss the importance of research examining prodromal symptoms of schizophrenia

Schizophrenia is a devastating psychological disorder that is characterized by major disturbances in thought, perception, emotion, and behavior. About 1% of the population experiences schizophrenia in their lifetime, and usually the disorder is first diagnosed during early adulthood (early to mid-20s). Most people with schizophrenia experience significant difficulties in many day-to-day activities, such as holding a job, paying bills, caring for oneself (grooming and hygiene), and maintaining relationships with others. Frequent hospitalizations are more often the rule rather than the exception with schizophrenia. Even when they receive the best treatments available, many with schizophrenia will continue to experience serious social and occupational impairment throughout their lives.

What is schizophrenia? First, schizophrenia is *not* a condition involving a split personality; that is, schizophrenia is not the same thing as dissociative identity disorder (better known as multiple personality disorder). These disorders are sometimes confused because the word *schizophrenia* first coined by the Swiss psychiatrist Eugen Bleuler in 1911, derives from Greek words that refer to a “splitting” (schizo) of psychic functions (phrene) (Green, 2001).

Schizophrenia is considered a psychotic disorder, or one in which the person’s thoughts, perceptions, and behaviors are impaired to the point where she is not able to function normally in life. In informal terms, one

who suffers from a psychotic disorder (that is, has a psychosis) is disconnected from the world in which most of us live.

Symptoms of Schizophrenia

The main symptoms of schizophrenia include hallucinations, delusions, disorganized thinking, disorganized or abnormal motor behavior, and negative symptoms (APA, 2013). A hallucination is a perceptual experience that occurs in the absence of external stimulation. Auditory hallucinations (hearing voices) occur in roughly two-thirds of patients with schizophrenia and are by far the most common form of hallucination (Andreasen, 1987). The voices may be familiar or unfamiliar, they may have a conversation or argue, or the voices may provide a running commentary on the person's behavior (Tsuang, Farone, & Green, 1999).

Less common are visual hallucinations (seeing things that are not there) and olfactory hallucinations (smelling odors that are not actually present).

Delusions are beliefs that are contrary to reality and are firmly held even in the face of contradictory evidence. Many of us hold beliefs that some would consider odd, but a delusion is easily identified because it is clearly absurd. A person with schizophrenia may believe that his mother is plotting with the FBI to poison his coffee, or that his neighbor is an enemy spy who wants to kill him. These kinds of delusions are known as paranoid delusions, which involve the (false) belief that other people or agencies are plotting to harm the person. People with schizophrenia also may hold grandiose delusions, beliefs that one holds special power, unique knowledge, or is extremely important. For example, the person who claims to be Jesus Christ, or who claims to have knowledge going back 5,000 years, or who claims to be a great philosopher is experiencing grandiose delusions. Other delusions include the belief that one's thoughts are being removed (thought withdrawal) or thoughts have been placed inside one's head (thought insertion). Another type of delusion is somatic delusion, which is the belief that something highly abnormal is happening to one's body (e.g., that one's kidneys are being eaten by cockroaches).

Disorganized thinking refers to disjointed and incoherent thought processes—usually detected by what a person says. The person might ramble, exhibit loose associations (jump from topic to topic), or talk in a way that is so disorganized and incomprehensible that it seems as though the person is randomly combining words. Disorganized thinking is also exhibited by blatantly illogical remarks (e.g., “Fenway Park is in Boston. I live in Boston. Therefore, I live at Fenway Park.”) and by tangentiality: responding to others' statements or questions by remarks that are either barely related or unrelated to what was said or asked. For example, if a person diagnosed with schizophrenia is asked if she is interested in receiving special job training, she might state that she once rode on a train somewhere. To a person with schizophrenia, the tangential (slightly related) connection between job *training* and riding a *train* are sufficient enough to cause such a response.

Disorganized or abnormal motor behavior refers to unusual behaviors and movements: becoming unusually active, exhibiting silly child-like behaviors (giggling and self-absorbed smiling), engaging in repeated and

purposeless movements, or displaying odd facial expressions and gestures. In some cases, the person will exhibit catatonic behaviors, which show decreased reactivity to the environment, such as posturing, in which the person maintains a rigid and bizarre posture for long periods of time, or catatonic stupor, a complete lack of movement and verbal behavior.

Negative symptoms are those that reflect noticeable decreases and absences in certain behaviors, emotions, or drives (Green, 2001). A person who exhibits diminished emotional expression shows no emotion in his facial expressions, speech, or movements, even when such expressions are normal or expected. Avolition is characterized by a lack of motivation to engage in self-initiated and meaningful activity, including the most basic of tasks, such as bathing and grooming. Alogia refers to reduced speech output; in simple terms, patients do not say much. Another negative symptom is asociality, or social withdrawal and lack of interest in engaging in social interactions with others. A final negative symptom, anhedonia, refers to an inability to experience pleasure. One who exhibits anhedonia expresses little interest in what most people consider to be pleasurable activities, such as hobbies, recreation, or sexual activity.

Watch this video and try to identify which classic symptoms of schizophrenia are shown:

[Schizophrenia: Gerald, Part 1.](#)



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=814#oembed-1>

Causes of Schizophrenia

There is considerable evidence suggesting that schizophrenia has a genetic basis. The risk of developing schizophrenia is nearly 6 times greater if one has a parent with schizophrenia than if one does not (Goldstein, Buka, Seidman, & Tsuang, 2010). Additionally, one's risk of developing schizophrenia increases as genetic relatedness to family members diagnosed with schizophrenia increases (Gottesman, 2001).

Genes

When considering the role of genetics in schizophrenia, as in any disorder, conclusions based on family

and twin studies are subject to criticism. This is because family members who are closely related (such as siblings) are more likely to share similar environments than are family members who are less closely related (such as cousins); further, identical twins may be more likely to be treated similarly by others than might fraternal twins. Thus, family and twin studies cannot completely rule out the possible effects of shared environments and experiences. Such problems can be corrected by using adoption studies, in which children are separated from their parents at an early age. One of the first adoption studies of schizophrenia conducted by Heston (1966) followed 97 adoptees, including 47 who were born to mothers with schizophrenia, over a 36-year period. Five of the 47 adoptees (11%) whose mothers had schizophrenia were later diagnosed with schizophrenia, compared to none of the 50 control adoptees. Other adoption studies have consistently reported that for adoptees who are later diagnosed with schizophrenia, their biological relatives have a higher risk of schizophrenia than do adoptive relatives (Shih, Belmonte, & Zandi, 2004).

Although adoption studies have supported the hypothesis that genetic factors contribute to schizophrenia, they have also demonstrated that the disorder most likely arises from a combination of genetic and environmental factors, rather than just genes themselves. For example, investigators in one study examined the rates of schizophrenia among 303 adoptees (Tienari et al., 2004). A total of 145 of the adoptees had biological mothers with schizophrenia; these adoptees constituted the high genetic risk group. The other 158 adoptees had mothers with no psychiatric history; these adoptees composed the low genetic risk group. The researchers managed to determine whether the adoptees' families were either healthy or disturbed. For example, the adoptees were considered to be raised in a disturbed family environment if the family exhibited a lot of criticism, conflict, and a lack of problem-solving skills. The findings revealed that adoptees whose mothers had schizophrenia (high genetic risk) *and* who had been raised in a disturbed family environment were much more likely to develop schizophrenia or another psychotic disorder (36.8%) than were adoptees whose biological mothers had schizophrenia but who had been raised in a healthy environment (5.8%), or than adoptees with a low genetic risk who were raised in either a disturbed (5.3%) or healthy (4.8%) environment. Because the adoptees who were at high genetic risk were likely to develop schizophrenia *only* if they were raised in a disturbed home environment, this study supports a diathesis-stress interpretation of schizophrenia—both genetic vulnerability and environmental stress are necessary for schizophrenia to develop, genes alone do not show the complete picture.

Neurotransmitters

If we accept that schizophrenia is at least partly genetic in origin, as it seems to be, it makes sense that the next step should be to identify biological abnormalities commonly found in people with the disorder. Perhaps not surprisingly, a number of neurobiological factors have indeed been found to be related to schizophrenia. One such factor that has received considerable attention for many years is the neurotransmitter dopamine. Interest in the role of dopamine in schizophrenia was stimulated by two sets of findings: drugs that increase dopamine levels can produce schizophrenia-like symptoms, and medications that block dopamine activity

reduce the symptoms (Howes & Kapur, 2009). The dopamine hypothesis of schizophrenia proposed that an overabundance of dopamine or too many dopamine receptors are responsible for the onset and maintenance of schizophrenia (Snyder, 1976). More recent work in this area suggests that abnormalities in dopamine vary by brain region and thus contribute to symptoms in unique ways. In general, this research has suggested that an overabundance of dopamine in the limbic system may be responsible for some symptoms, such as hallucinations and delusions, whereas low levels of dopamine in the prefrontal cortex might be responsible primarily for the negative symptoms (avolition, alogia, asociality, and anhedonia) (Davis, Kahn, Ko, & Davidson, 1991). In recent years, serotonin has received attention, and newer antipsychotic medications used to treat the disorder work by blocking serotonin receptors (Baumeister & Hawkins, 2004).

Brain Anatomy

Brain imaging studies reveal that people with schizophrenia have enlarged ventricles, the cavities within the brain that contain cerebral spinal fluid (Green, 2001). This finding is important because larger than normal ventricles suggests that various brain regions are reduced in size, thus implying that schizophrenia is associated with a loss of brain tissue. In addition, many people with schizophrenia display a reduction in gray matter (cell bodies of neurons) in the frontal lobes (Lawrie & Abukmeil, 1998), and many show less frontal lobe activity when performing cognitive tasks (Buchsbaum et al., 1990). The frontal lobes are important in a variety of complex cognitive functions, such as planning and executing behavior, attention, speech, movement, and problem solving. Hence, abnormalities in this region provide merit in explaining why people with schizophrenia experience deficits in these of areas.

Events During Pregnancy

Why do people with schizophrenia have these brain abnormalities? A number of environmental factors that could impact normal brain development might be at fault. High rates of obstetric complications in the births of children who later developed schizophrenia have been reported (Cannon, Jones, & Murray, 2002). In addition, people are at an increased risk for developing schizophrenia if their mother was exposed to influenza during the first trimester of pregnancy (Brown et al., 2004). Research has also suggested that a mother's emotional stress during pregnancy may increase the risk of schizophrenia in offspring. One study reported that the risk of schizophrenia is elevated substantially in offspring whose mothers experienced the death of a relative during the first trimester of pregnancy (Khashan et al., 2008).

Marijuana

Another variable that is linked to schizophrenia is marijuana use. Although a number of reports have shown

that individuals with schizophrenia are more likely to use marijuana than are individuals without schizophrenia (Thornicroft, 1990), such investigations cannot determine if marijuana use leads to schizophrenia, or vice versa. However, a number of longitudinal studies have suggested that marijuana use is, in fact, a risk factor for schizophrenia. A classic investigation of over 45,000 Swedish conscripts who were followed up after 15 years found that those individuals who had reported using marijuana at least once by the time of conscription were more than 2 times as likely to develop schizophrenia during the ensuing 15 years than were those who reported never using marijuana; those who had indicated using marijuana 50 or more times were 6 times as likely to develop schizophrenia (Andréasson, Allbeck, Engström, & Rydberg, 1987). More recently, a review of 35 longitudinal studies found a substantially increased risk of schizophrenia and other psychotic disorders in people who had used marijuana, with the greatest risk in the most frequent users (Moore et al., 2007). Other work has found that marijuana use is associated with an onset of psychotic disorders at an earlier age (Large, Sharma, Compton, Slade, & Nielssen, 2011). Overall, the available evidence seems to indicate that marijuana use plays a causal role in the development of schizophrenia, although it is important to point out that marijuana use is not an essential or sufficient risk factor as not all people with schizophrenia have used marijuana and the majority of marijuana users do not develop schizophrenia (Casadio, Fernandes, Murray, & Di Forti, 2011). One plausible interpretation of the data is that early marijuana use may disrupt normal brain development during important early maturation periods in adolescence (Trezza, Cuomo, & Vanderschuren, 2008). Thus, early marijuana use may set the stage for the development of schizophrenia and other psychotic disorders, especially among individuals with an established vulnerability (Casadio et al., 2011).

Test your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=814#h5p-244>

Schizophrenia: Early Warning Signs

Early detection and treatment of conditions such as heart disease and cancer have improved survival rates

and quality of life for people who suffer from these conditions. A new approach involves identifying people who show minor symptoms of psychosis, such as unusual thought content, paranoia, odd communication, delusions, problems at school or work, and a decline in social functioning—which are coined prodromal symptoms—and following these individuals over time to determine which of them develop a psychotic disorder and which factors best predict such a disorder. A number of factors have been identified that predict a greater likelihood that prodromal individuals will develop a psychotic disorder: genetic risk (a family history of psychosis), recent deterioration in functioning, high levels of unusual thought content, high levels of suspicion or paranoia, poor social functioning, and a history of substance abuse (Fusar-Poli et al., 2013). Further research will enable a more accurate prediction of those at greatest risk for developing schizophrenia, and thus to whom early intervention efforts should be directed.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=814#h5p-245>

Summary

Schizophrenia is a severe disorder characterized by a complete breakdown in one's ability to function in life; it often requires hospitalization. People with schizophrenia experience hallucinations and delusions, and they have extreme difficulty regulating their emotions and behavior. Thinking is incoherent and disorganized, behavior is extremely bizarre, emotions are flat, and motivation to engage in most basic life activities is lacking. Considerable evidence shows that genetic factors play a central role in schizophrenia; however, adoption studies have highlighted the additional importance of environmental factors. Neurotransmitter and brain abnormalities, which may be linked to environmental factors such as obstetric complications or exposure to influenza during the gestational period, have also been implicated. A promising new area of schizophrenia research involves identifying individuals who show prodromal symptoms and following them over time to

determine which factors best predict the development of schizophrenia. Future research may enable us to pinpoint those especially at risk for developing schizophrenia and who may benefit from early intervention.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=814#h5p-246>

Critical Thinking Question

Why is research following individuals who show prodromal symptoms of schizophrenia so important?

This kind of research is important because it enables investigators to identify potential warning signs that predict the onset of schizophrenia. Once such factors are identified, interventions may be developed.

Media Attributions

- “[Schizophrenia: Gerald, Part 1](#)” by [Neuroslicer](#). Standard YouTube License.

77.

DISSOCIATIVE DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Describe the essential nature of dissociative disorders
- Identify and differentiate the symptoms of dissociative amnesia, depersonalization/derealization disorder, and dissociative identity disorder
- Discuss the potential role of both social and psychological factors in dissociative identity disorder

Dissociative disorders are characterized by an individual becoming split off, or dissociated, from her core sense of self. Memory and identity become disturbed; these disturbances have a psychological rather than physical cause. Dissociative disorders listed in the DSM-5 include dissociative amnesia, depersonalization/derealization disorder, and dissociative identity disorder.

Dissociative Amnesia

Amnesia refers to the partial or total forgetting of some experience or event. An individual with dissociative amnesia is unable to recall important personal information, usually following an extremely stressful or traumatic experience such as combat, natural disasters, or being the victim of violence. The memory impairments are not caused by ordinary forgetting. Some individuals with dissociative amnesia will also experience dissociative fugue (from the word “to flee” in French), whereby they suddenly wander away from their home, experience confusion about their identity, and sometimes even adopt a new identity (Cardeña & Gleaves, 2006). Most fugue episodes last only a few hours or days, but some can last longer. One study of

residents in communities in upstate New York reported that about 1.8% experienced dissociative amnesia in the previous year (Johnson, Cohen, Kasen, & Brook, 2006).

Some have questioned the validity of dissociative amnesia (Pope, Hudson, Bodkin, & Oliva, 1998); it has even been characterized as a “piece of psychiatric folklore devoid of convincing empirical support” (McNally, 2003, p. 275). Notably, scientific publications regarding dissociative amnesia rose during the 1980s and reached a peak in the mid-1990s, followed by an equally sharp decline by 2003; in fact, only 13 cases of individuals with dissociative amnesia worldwide could be found in the literature that same year (Pope, Barry, Bodkin, & Hudson, 2006). Further, no description of individuals showing dissociative amnesia following a trauma exists in any fictional or nonfictional work prior to 1800 (Pope, Poliakoff, Parker, Boynes, & Hudson, 2006). However, a study of 82 individuals who enrolled for treatment at a psychiatric outpatient hospital found that nearly 10% met the criteria for dissociative amnesia, perhaps suggesting that the condition is underdiagnosed, especially in psychiatric populations (Foote, Smolin, Kaplan, Legatt, & Lipschitz, 2006).

Depersonalization/Derealization Disorder

Depersonalization/derealization disorder is characterized by recurring episodes of depersonalization, derealization, or both. Depersonalization is defined as feelings of “unreality or detachment from, or unfamiliarity with, one’s whole self or from aspects of the self” (APA, 2013, p. 302). Individuals who experience depersonalization might believe their thoughts and feelings are not their own; they may feel robotic as though they lack control over their movements and speech; they may experience a distorted sense of time and, in extreme cases, they may sense an “out-of-body” experience in which they see themselves from the vantage point of another person. Derealization is conceptualized as a sense of “unreality or detachment from, or unfamiliarity with, the world, be it individuals, inanimate objects, or all surroundings” (APA, 2013, p. 303). A person who experiences derealization might feel as though he is in a fog or a dream, or that the surrounding world is somehow artificial and unreal. Individuals with depersonalization/derealization disorder often have difficulty describing their symptoms and may think they are going crazy (APA, 2013).

Dissociative Identity Disorder

By far, the most well-known dissociative disorder is dissociative identity disorder (formerly called multiple personality disorder). People with dissociative identity disorder exhibit two or more separate personalities or identities, each well-defined and distinct from one another. They also experience memory gaps for the time during which another identity is in charge (e.g., one might find unfamiliar items in her shopping bags or among her possessions), and in some cases may report hearing voices, such as a child’s voice or the sound of somebody crying (APA, 2013). The study of upstate New York residents mentioned above (Johnson et al., 2006) reported

that 1.5% of their sample experienced symptoms consistent with dissociative identity disorder in the previous year.

Dissociative identity disorder (DID) is highly controversial. Some believe that people fake symptoms to avoid the consequences of illegal actions (e.g., “I am not responsible for shoplifting because it was my other personality”). In fact, it has been demonstrated that people are generally skilled at adopting the role of a person with different personalities when they believe it might be advantageous to do so. As an example, Kenneth Bianchi was an infamous serial killer who, along with his cousin, murdered over a dozen females around Los Angeles in the late 1970s. Eventually, he and his cousin were apprehended. At Bianchi’s trial, he pled not guilty by reason of insanity, presenting himself as though he had DID and claiming that a different personality (“Steve Walker”) committed the murders. When these claims were scrutinized, he admitted faking the symptoms and was found guilty (Schwartz, 1981).

A second reason DID is controversial is because rates of the disorder suddenly skyrocketed in the 1980s. More cases of DID were identified during the five years prior to 1986 than in the preceding two centuries (Putnam, Guroff, Silberman, Barban, & Post, 1986). Although this increase may be due to the development of more sophisticated diagnostic techniques, it is also possible that the popularization of DID—helped in part by *Sybil*, a popular 1970s book (and later film) about a woman with 16 different personalities—may have prompted clinicians to over diagnose the disorder (Piper & Merskey, 2004). Casting further scrutiny on the existence of multiple personalities or identities is the recent suggestion that the story of *Sybil* was largely fabricated, and the idea for the book might have been exaggerated (Nathan, 2011).

Despite its controversial nature, DID is clearly a legitimate and serious disorder, and although some people may fake symptoms, others suffer their entire lives with it. People with this disorder tend to report a history of childhood trauma, some cases having been corroborated through medical or legal records (Cardeña & Gleaves, 2006). Research by Ross et al. (1990) suggests that in one study about 95% of people with DID were physically and/or sexually abused as children. Of course, not all reports of childhood abuse can be expected to be valid or accurate. However, there is strong evidence that traumatic experiences can cause people to experience states of dissociation, suggesting that dissociative states—including the adoption of multiple personalities—may serve as a psychologically important coping mechanism for threat and danger (Dalenberg et al., 2012).

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=816#h5p-248>

Summary

The main characteristic of dissociative disorders is that people become dissociated from their sense of self, resulting in memory and identity disturbances. Dissociative disorders listed in the DSM-5 include dissociative amnesia, depersonalization/derealization disorder, and dissociative identity disorder. A person with dissociative amnesia is unable to recall important personal information, often after a stressful or traumatic experience.

Depersonalization/derealization disorder is characterized by recurring episodes of depersonalization (i.e., detachment from or unfamiliarity with the self) and/or derealization (i.e., detachment from or unfamiliarity with the world). A person with dissociative identity disorder exhibits two or more well-defined and distinct personalities or identities, as well as memory gaps for the time during which another identity was present.

Dissociative identity disorder has generated controversy, mainly because some believe its symptoms can be faked by patients if presenting its symptoms somehow benefits the patient in avoiding negative consequences or taking responsibility for one's actions. The diagnostic rates of this disorder have increased dramatically following its portrayal in popular culture. However, many people legitimately suffer over the course of a lifetime with this disorder.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=816#h5p-249>

Critical Thinking Question

The prevalence of most psychological disorders has increased since the 1980s. However, as discussed in this section, scientific publications regarding dissociative amnesia peaked in the mid-1990s but then declined steeply through 2003. In addition, no fictional or nonfictional description of individuals showing dissociative amnesia following a trauma exists prior to 1800. How would you explain this phenomenon?

Several explanations are possible. One explanation is that perhaps there is little scientific interest in this phenomenon, maybe because it has yet to gain consistent scientific acceptance. Another possible explanation is that perhaps the dissociative amnesia was fashionable at the time publications dealing with this topic peaked (1990s); perhaps since that time it has become less fashionable.

Personal Application Question

Try to find an example (via a search engine) of a past instance in which a person committed a horrible crime, was apprehended, and later claimed to have dissociative identity disorder during the trial. What was the outcome? Was the person revealed to be faking? If so, how was this determined?

78.

PERSONALITY DISORDERS

Learning Objectives

By the end of this section, you will be able to:

- Describe the nature of personality disorders and how they differ from other disorders
- List and distinguish between the three clusters of personality disorders
- Identify the basic features of borderline personality disorder and antisocial personality disorder and the factors that are important in the etiology of both

The term *personality* refers loosely to one's stable, consistent, and distinctive way of thinking about, feeling, acting, and relating to the world. People with personality disorders exhibit a personality style that differs markedly from the expectations of their culture, is pervasive and inflexible, begins in adolescence or early adulthood, and causes distress or impairment (APA, 2013). Generally, individuals with these disorders exhibit enduring personality styles that are extremely troubling and often create problems for them and those with whom they come into contact. Their maladaptive personality styles frequently bring them into conflict with others, disrupt their ability to develop and maintain social relationships, and prevent them from accomplishing realistic life goals.

The DSM-5 recognizes 10 personality disorders, organized into 3 different clusters. Cluster A disorders include paranoid personality disorder, schizoid personality disorder, and schizotypal personality disorder. People with these disorders display a personality style that is odd or eccentric. Cluster B disorders include antisocial personality disorder, histrionic personality disorder, narcissistic personality disorder, and borderline personality disorder. People with these disorders usually are impulsive, overly dramatic, highly emotional, and erratic. Cluster C disorders include avoidant personality disorder, dependent personality disorder, and obsessive-compulsive personality disorder (which is not the same thing as obsessive-compulsive disorder). People with these disorders often appear to be nervous and fearful.

DSM-5 Personality Disorders

DSM-5 Personality Disorder	Description	Cluster
Paranoid	harbors a pervasive and unjustifiable suspiciousness and mistrust of others; reluctant to confide in or become close to others; reads hidden demeaning or threatening meaning into benign remarks or events; takes offense easily and bears grudges; not due to schizophrenia or other psychotic disorders	A
Schizoid	lacks interest and desire to form relationships with others; aloof and shows emotional coldness and detachment; indifferent to approval or criticism of others; lacks close friends or confidants; not due to schizophrenia or other psychotic disorders, not an autism spectrum disorder	A
Schizotypal	exhibits eccentricities in thought, perception, emotion, speech, and behavior; shows suspiciousness or paranoia; has unusual perceptual experiences; speech is often idiosyncratic; displays inappropriate emotions; lacks friends or confidants; not due to schizophrenia or other psychotic disorder, or to autism spectrum disorder	A
Antisocial	continuously violates the rights of others; history of antisocial tendencies prior to age 15; often lies, fights, and has problems with the law; impulsive and fails to think ahead; can be deceitful and manipulative in order to gain profit or pleasure; irresponsible and often fails to hold down a job or pay financial debts; lacks feelings for others and remorse over misdeeds	B
Histrionic	excessively overdramatic, emotional, and theatrical; feels uncomfortable when not the center of others' attention; behavior is often inappropriately seductive or provocative; speech is highly emotional but often vague and diffuse; emotions are shallow and often shift rapidly; may alienate friends with demands for constant attention	B
Narcissistic	overinflated and unjustified sense of self-importance and preoccupied with fantasies of success; believes they are entitled to special treatment from others; shows arrogant attitudes and behaviors; takes advantage of others; lacks empathy	B
Borderline	unstable in self-image, mood, and behavior; cannot tolerate being alone and experiences chronic feelings of emptiness; unstable and intense relationships with others; behavior is impulsive, unpredictable, and sometimes self-damaging; shows inappropriate and intense anger; makes suicidal gestures	B
Avoidant	socially inhibited and oversensitive to negative evaluation; avoids occupations that involve interpersonal contact because of fears of criticism or rejection; avoids relationships with others unless guaranteed to be accepted unconditionally; feels inadequate and views self as socially inept and unappealing; unwilling to take risks or engage in new activities if they may prove embarrassing	C
Dependent	allows others to take over and run their life; is submissive, clingy, and fears separation; cannot make decisions without advice and reassurance from others; lacks self-confidence; cannot do things on their own; feels uncomfortable or helpless when alone	C
Obsessive-Compulsive	pervasive need for perfectionism that interferes with the ability to complete tasks; preoccupied with details, rules, order, and schedules; excessively devoted to work at the expense of leisure and friendships; rigid, inflexible, and stubborn; insists things be done their way; miserly with money	C

Slightly over 9% of the U.S. population suffers from a personality disorder, with avoidant and schizoid personality disorders being the most frequent (Lezenweger, Lane, Loranger, & Kessler, 2007). Two of these personality disorders, borderline personality disorder and antisocial personality disorder, are regarded by many as especially problematic.

Borderline Personality Disorder

The “borderline” in borderline personality disorder was originally coined in the late 1930s in an effort to describe patients who appeared anxious, but were prone to brief psychotic experiences—that is, patients who were thought to be literally on the borderline between anxiety and psychosis (Freeman, Stone, Martin, & Reinecke, 2005). Today, borderline personality disorder has a completely different meaning. Borderline personality disorder is characterized chiefly by instability in interpersonal relationships, self-image, and mood, as well as marked impulsivity (APA, 2013). People with borderline personality disorder cannot tolerate the thought of being alone and will make frantic efforts (including making suicidal gestures and engaging in self-mutilation) to avoid abandonment or separation (whether real or imagined). Their relationships are intense and unstable; for example, a lover may be idealized early in a relationship, but then later vilified at the slightest sign she appears to no longer show interest. These individuals have an unstable view of self and, thus, might suddenly display a shift in personal attitudes, interests, career plans, and choice of friends. For example, a law school student may, despite having invested tens of thousands of dollars toward earning a law degree and despite having performed well in the program, consider dropping out and pursuing a career in another field. People with borderline personality disorder may be highly impulsive and may engage in reckless and self-destructive behaviors such as excessive gambling, spending money irresponsibly, substance abuse, engaging in unsafe sex, and reckless driving. They sometimes show intense and inappropriate anger that they have difficulty controlling, and they can be moody, sarcastic, bitter, and verbally abusive.

The prevalence of borderline personality disorder in the U.S. population is estimated to be around 1.4% (Lezenweger et al., 2007), but the rates are higher among those who use mental health services; approximately 10% of mental health outpatients and 20% of psychiatric inpatients meet the criteria for diagnosis (APA, 2013). Additionally, borderline personality disorder is comorbid with anxiety, mood, and substance use disorders (Lezenweger et al., 2007).

Biological Basis for Borderline Personality Disorder

Genetic factors appear to be important in the development of borderline personality disorder. For example, core personality traits that characterize this disorder, such as impulsivity and emotional instability, show a high degree of heritability (Livesley, 2008). Also, the rates of borderline personality disorder among relatives of people with this disorder have been found to be as high as 24.9% (White, Gunderson, Zanarani, & Hudson,

2003). Individuals with borderline personality disorder report experiencing childhood physical, sexual, and/or emotional abuse at rates far greater than those observed in the general population (Afifi et al., 2010), indicating that environmental factors are also crucial. These findings would suggest that borderline personality disorder may be determined by an interaction between genetic factors and adverse environmental experiences. Consistent with this hypothesis, one study found that the highest rates of borderline personality disorder were among individuals with a borderline temperament (characterized by high novelty seeking and high harm-avoidance) and those who experienced childhood abuse and/or neglect (Joyce et al., 2003).

Antisocial Personality Disorder

Most human beings live in accordance with a moral compass, a sense of right and wrong. Most individuals learn at a very young age that there are certain things that should not be done. We learn that we should not lie or cheat. We are taught that it is wrong to take things that do not belong to us, and that it is wrong to exploit others for personal gain. We also learn the importance of living up to our responsibilities, of doing what we say we will do. People with antisocial personality disorder, however, do not seem to have a moral compass. These individuals act as though they neither have a sense of nor care about right or wrong. Not surprisingly, these people represent a serious problem for others and for society in general.

According to the DSM-5, the individual with antisocial personality disorder (sometimes referred to as psychopathy) shows no regard at all for other people's rights or feelings. This lack of regard is exhibited a number of ways and can include repeatedly performing illegal acts, lying to or conning others, impulsivity and recklessness, irritability and aggressiveness toward others, and failure to act in a responsible way (e.g., leaving debts unpaid) (APA, 2013). The worst part about antisocial personality disorder, however, is that people with this disorder have no remorse over one's misdeeds; these people will hurt, manipulate, exploit, and abuse others and not feel any guilt. Signs of this disorder can emerge early in life; however, a person must be at least 18 years old to be diagnosed with antisocial personality disorder.

People with antisocial personality disorder seem to view the world as self-serving and unkind. They seem to think that they should use whatever means necessary to get by in life. They tend to view others not as living, thinking, feeling beings, but rather as pawns to be used or abused for a specific purpose. They often have an over-inflated sense of themselves and can appear extremely arrogant. They frequently display superficial charm; for example, without really meaning it they might say exactly what they think another person wants to hear. They lack empathy; they are incapable of understanding the emotional point-of-view of others. People with this disorder may become involved in illegal enterprises, show cruelty toward others, leave their jobs with no plans to obtain another job, have multiple sexual partners, repeatedly get into fights with others, and show reckless disregard for themselves and others (e.g., repeated arrests for driving while intoxicated) (APA, 2013).

A useful way to conceptualize antisocial personality disorder is boiling the diagnosis down to three major concepts: disinhibition, boldness, and meanness (Patrick, Fowles, & Krueger, 2009). Disinhibition is a

propensity toward impulse control problems, lack of planning and forethought, insistence on immediate gratification, and inability to restrain behavior. Boldness describes a tendency to remain calm in threatening situations, high self-assurance, a sense of dominance, and a tendency toward thrill-seeking. Meanness is defined as “aggressive resource seeking without regard for others,” and is signaled by a lack of empathy, disdain for and lack of close relationships with others, and a tendency to accomplish goals through cruelty (Patrick et al., 2009, p. 913).

Risk Factors for Antisocial Personality Disorder

Antisocial personality disorder is observed in about 3.6% of the population; the disorder is much more common among males, with a 3 to 1 ratio of men to women, and it is more likely to occur in men who are younger, widowed, separated, divorced, of lower socioeconomic status, who live in urban areas, and who live in the western United States (Compton, Conway, Stinson, Colliver, & Grant, 2005). Compared to men with antisocial personality disorder, women with the disorder are more likely to have experienced emotional neglect and sexual abuse during childhood, and they are more likely to have had parents who abused substances and who engaged in antisocial behaviors themselves (Alegria et al., 2013).

This table shows some of the differences in the specific types of antisocial behaviors that men and women with antisocial personality disorder exhibit (Alegria et al., 2013).

Gender Differences in Antisocial Personality Disorder	
Men with antisocial personality disorder are more likely than women with antisocial personality disorder to	Women with antisocial personality disorder are more likely than men with antisocial personality disorder to
<ul style="list-style-type: none">• do things that could easily hurt themselves or others• receive three or more traffic tickets for reckless driving• have their driver’s license suspended• destroy others’ property• start a fire on purpose• make money illegally• do anything that could lead to arrest• hit someone hard enough to injure them• hurt an animal on purpose	<ul style="list-style-type: none">• run away from home overnight• frequently miss school or work• lie frequently• forge someone’s signature• get into a fight that comes to blows with an intimate partner• live with others besides the family for at least one month• harass, threaten, or blackmail someone

Family, twin, and adoption studies suggest that both genetic and environmental factors influence the development of antisocial personality disorder, as well as general antisocial behavior (criminality, violence, aggressiveness) (Baker, Bezdjian, & Raine, 2006). Personality and temperament dimensions that are related to this disorder, including fearlessness, impulsive antisociality, and callousness, have a substantial genetic influence (Livesley & Jang, 2008). Adoption studies clearly demonstrate that the development of antisocial

behavior is determined by the interaction of genetic factors and adverse environmental circumstances (Rhee & Waldman, 2002). For example, one investigation found that adoptees of biological parents with antisocial personality disorder were more likely to exhibit adolescent and adult antisocial behaviors if they were raised in adverse adoptive family environments (e.g., adoptive parents had marital problems, were divorced, used drugs, and had legal problems) than if they were raised in a more normal adoptive environment (Cadoret, Yates, Ed, Woodworth, & Stewart, 1995).

Researchers who are interested in the importance of environment in the development of antisocial personality disorder have directed their attention to such factors as the community, the structure and functioning of the family, and peer groups. Each of these factors influences the likelihood of antisocial behavior. One longitudinal investigation of more than 800 Seattle-area youth measured risk factors for violence at 10, 14, 16, and 18 years of age (Herrenkohl et al., 2000). The risk factors examined included those involving the family, peers, and community.

Risk Factors During Adolescence That Predict Later Violence			
Risk factor	Age 10 predictor (elementary school)	Age 14 predictor (middle school)	Age 16 predictor (high school)
Family			
Parental violence		×	
Parental criminality		×	×
Poor family management		×	×
Family conflict		×	×
Parental attitudes favorable to violence	×		
Frequent moves			×
Peer			
Peer delinquency	×	×	×
Gang membership		×	×
Community			
Economic deprivation	×		×
Community disorganization		×	×
Availability of drugs	×	×	×
Neighborhood adults involved in crime		×	×

Longitudinal studies have helped to identify risk factors for predicting violent behavior.

Those with antisocial tendencies do not seem to experience emotions the way most other people do. These individuals fail to show fear in response to environment cues that signal punishment, pain, or noxious stimulation. For instance, they show less skin conductance (sweatiness on hands) in anticipation of electric shock than do people without antisocial tendencies (Hare, 1965). Skin conductance is controlled by the sympathetic nervous system and is used to assess autonomic nervous system functioning. When the sympathetic nervous system is active, people become aroused and anxious, and sweat gland activity increases. Thus, increased sweat gland activity, as assessed through skin conductance, is taken as a sign of arousal or anxiety. For those with antisocial personality disorder, a lack of skin conductance may indicate the presence of characteristics such as emotional deficits and impulsivity that underlie the propensity for antisocial behavior and negative social relationships (Fung et al., 2005).

While emotional deficits may contribute to antisocial personality disorder, so too might an inability to relate to others' pain. In a recent study, 80 prisoners were shown photos of people being intentionally hurt by others (e.g., someone crushing a person's hand in an automobile door) while undergoing brain imaging (Decety, Skelly, & Kiehl, 2013). Prisoners who scored high on a test of antisocial tendencies showed significantly less activation in brain regions involved in the experience of empathy and feeling concerned for others than did prisoners with low scores on the antisocial test. Notably, the prisoners who scored high on the antisocial test showed greater activation in a brain area involved self-awareness, cognitive function, and interpersonal experience. The investigators suggested that the heightened activation in this region when watching social interactions involving one person harming another may reflect a propensity or desire for this kind of behavior.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=818#h5p-251>

Summary

Individuals with personality disorders exhibit a personality style that is inflexible, causes distress and impairment, and creates problems for themselves and others. The DSM-5 recognizes 10 personality disorders, organized into three clusters. The disorders in Cluster A include those characterized by a personality style that is odd and eccentric. Cluster B includes personality disorders characterized chiefly by a personality style that is impulsive, dramatic, highly emotional, and erratic, and those in Cluster C are characterized by a nervous and fearful personality style. Two Cluster B personality disorders, borderline personality disorder and antisocial personality disorder, are especially problematic. People with borderline personality disorder show marked instability in mood, behavior, and self-image, as well as impulsivity. They cannot stand to be alone, are unpredictable, have a history of stormy relationships, and frequently display intense and inappropriate anger. Genetic factors and adverse childhood experiences (e.g., sexual abuse) appear to be important in its development. People with antisocial personality display a lack of regard for the rights of others; they are impulsive, deceitful, irresponsible, and unburdened by any sense of guilt. Genetic factors and socialization both appear to be important in the origin of antisocial personality disorder. Research has also shown that those with this disorder do not experience emotions the way most other people do.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=818#h5p-252>

Critical Thinking Question

Imagine that a child has a genetic vulnerability to antisocial personality disorder. How might

this child's environment shape the likelihood of developing this personality disorder?

The environment is likely to be very instrumental in determining the likelihood of developing antisocial personality disorder. Research has shown that adverse family environments (e.g., divorce or marital problems, legal problems, and drug use) are connected to antisocial personality disorder, particularly if one is genetically vulnerable. Beyond one's family environment, peer group delinquency and community variables (e.g., economic deprivation, community disorganization, drug use, and the presence of adult antisocial models) heighten the risk of violent behavior.

79.

DISORDERS IN CHILDHOOD

Learning Objectives

By the end of this section, you will be able to:

- Describe the nature and symptoms of attention deficit/hyperactivity disorder and autism spectrum disorder
- Discuss the prevalence and factors that contribute to the development of these disorders

Most of the disorders we have discussed so far are typically diagnosed in adulthood, although they can and sometimes do occur during childhood. However, there are a group of conditions that, when present, are diagnosed early in childhood, often before the time a child enters school. These conditions are listed in the DSM-5 as neurodevelopmental disorders, and they involve developmental problems in personal, social, academic, and intellectual functioning (APA, 2013). In this section, we will discuss two such disorders: attention deficit/ hyperactivity disorder and autism.

Attention Deficit/Hyperactivity Disorder

Diego is always active, from the time he wakes up in the morning until the time he goes to bed at night. His mother reports that he came out the womb kicking and screaming, and he has not stopped moving since. He has a sweet disposition, but always seems to be in trouble with his teachers, parents, and after-school program counselors. He seems to accidentally break things; he lost his jacket three times last winter, and he never seems to sit still. His teachers believe he is a smart child, but he never finishes anything he starts and is so impulsive that he does not seem to learn much in school.

Diego likely has attention deficit/hyperactivity disorder (ADHD). The symptoms of this disorder were first described by Hans Hoffman in the 1920s. While taking care of his son while his wife was in the hospital giving

birth to a second child, Hoffman noticed that the boy had trouble concentrating on his homework, had a short attention span, and had to repeatedly go over easy homework to learn the material (Jellinek & Herzog, 1999). Later, it was discovered that many hyperactive children—those who are fidgety, restless, socially disruptive, and have trouble with impulse control—also display short attention spans, problems with concentration, and distractibility. By the 1970s, it had become clear that many children who display attention problems often also exhibit signs of hyperactivity. In recognition of such findings, the DSM-III (published in 1980) included a new disorder: attention deficit disorder with and without hyperactivity, now known as attention deficit/hyperactivity disorder (ADHD).

A child with ADHD shows a constant pattern of inattention and/or hyperactive and impulsive behavior that interferes with normal functioning (APA, 2013). Some of the signs of inattention include great difficulty with and avoidance of tasks that require sustained attention (such as conversations or reading), failure to follow instructions (often resulting in failure to complete school work and other duties), disorganization (difficulty keeping things in order, poor time management, sloppy and messy work), lack of attention to detail, becoming easily distracted, and forgetfulness. Hyperactivity is characterized by excessive movement, and includes fidgeting or squirming, leaving one's seat in situations when remaining seated is expected, having trouble sitting still (e.g., in a restaurant), running about and climbing on things, blurting out responses before another person's question or statement has been completed, difficulty waiting one's turn for something, and interrupting and intruding on others. Frequently, the hyperactive child comes across as noisy and boisterous. The child's behavior is hasty, impulsive, and seems to occur without much forethought; these characteristics may explain why adolescents and young adults diagnosed with ADHD receive more traffic tickets and have more automobile accidents than do others (Thompson, Molina, Pelham, & Gnagy, 2007).

ADHD occurs in about 5% of children (APA, 2013). On the average, boys are 3 times more likely to have ADHD than are girls; however, such findings might reflect the greater propensity of boys to engage in aggressive and antisocial behavior and thus incur a greater likelihood of being referred to psychological clinics (Barkley, 2006). Children with ADHD face severe academic and social challenges. Compared to their non-ADHD counterparts, children with ADHD have lower grades and standardized test scores and higher rates of expulsion, grade retention, and dropping out (Loe & Feldman, 2007). They also are less well-liked and more often rejected by their peers (Hoza et al., 2005).

Previously, ADHD was thought to fade away by adolescence. However, longitudinal studies have suggested that ADHD is a chronic problem, one that can persist into adolescence and adulthood (Barkley, Fischer, Smallish, & Fletcher, 2002). A recent study found that 29.3% of adults who had been diagnosed with ADHD decades earlier still showed symptoms (Barbarese et al., 2013). Somewhat troubling, this study also reported that nearly 81% of those whose ADHD persisted into adulthood had experienced at least one other comorbid disorder, compared to 47% of those whose ADHD did not persist.

Life Problems from ADHD

Children diagnosed with ADHD face considerably worse long-term outcomes than do those children who do not receive such a diagnosis. In one investigation, 135 adults who had been identified as having ADHD symptoms in the 1970s were contacted decades later and interviewed (Klein et al., 2012). Compared to a control sample of 136 participants who had never been diagnosed with ADHD, those who were diagnosed as children:

- had worse educational attainment (more likely to have dropped out of high school and less likely to have earned a bachelor's degree);
- had lower socioeconomic status;
- held less prestigious occupational positions;
- were more likely to be unemployed;
- made considerably less in salary;
- scored worse on a measure of occupational functioning (indicating, for example, lower job satisfaction, poorer work relationships, and more firings);
- scored worse on a measure of social functioning (indicating, for example, fewer friendships and less involvement in social activities);
- were more likely to be divorced; and
- were more likely to have non-alcohol-related substance abuse problems. (Klein et al., 2012)

Longitudinal studies also show that children diagnosed with ADHD are at higher risk for substance abuse problems. One study reported that childhood ADHD predicted later drinking problems, daily smoking, and use of marijuana and other illicit drugs (Molina & Pelham, 2003). The risk of substance abuse problems appears to be even greater for those with ADHD who also exhibit antisocial tendencies (Marshall & Molina, 2006).

Causes of ADHD

Family and twin studies indicate that genetics play a significant role in the development of ADHD. Burt (2009), in a review of 26 studies, reported that the median rate of concordance for identical twins was .66 (one study reported a rate of .90), whereas the median concordance rate for fraternal twins was .20. This study also found that the median concordance rate for unrelated (adoptive) siblings was .09; although this number is small, it is greater than 0, thus suggesting that the environment may have at least some influence. Another review of studies concluded that the heritability of inattention and hyperactivity were 71% and 73%, respectively (Nikolas & Burt, 2010).

The specific genes involved in ADHD are thought to include at least two that are important in the

regulation of the neurotransmitter dopamine (Gizer, Ficks, & Waldman, 2009), suggesting that dopamine may be important in ADHD. Indeed, medications used in the treatment of ADHD, such as methylphenidate (Ritalin) and amphetamine with dextroamphetamine (Adderall), have stimulant qualities and elevate dopamine activity. People with ADHD show less dopamine activity in key regions of the brain, especially those associated with motivation and reward (Volkow et al., 2009), which provides support to the theory that dopamine deficits may be a vital factor in the development of this disorder (Swanson et al., 2007).

Brain imaging studies have shown that children with ADHD exhibit abnormalities in their frontal lobes, an area in which dopamine is in abundance. Compared to children without ADHD, those with ADHD appear to have smaller frontal lobe volume, and they show less frontal lobe activation when performing mental tasks. Recall that one of the functions of the frontal lobes is to inhibit our behavior. Thus, abnormalities in this region may go a long way toward explaining the hyperactive, uncontrolled behavior of ADHD.

By the 1970s, many had become aware of the connection between nutritional factors and childhood behavior. At the time, much of the public believed that hyperactivity was caused by sugar and food additives, such as artificial coloring and flavoring. Undoubtedly, part of the appeal of this hypothesis was that it provided a simple explanation of (and treatment for) behavioral problems in children. A statistical review of 16 studies, however, concluded that sugar consumption has no effect at all on the behavioral and cognitive performance of children (Wolraich, Wilson, & White, 1995). Additionally, although food additives have been shown to increase hyperactivity in non-ADHD children, the effect is rather small (McCann et al., 2007). Numerous studies, however, have shown a significant relationship between exposure to nicotine in cigarette smoke during the prenatal period and ADHD (Linnet et al., 2003). Maternal smoking during pregnancy is associated with the development of more severe symptoms of the disorder (Thakur et al., 2013).

Is ADHD caused by poor parenting? Not likely. Remember, the genetics studies discussed above suggested that the family environment does not seem to play much of a role in the development of this disorder; if it did, we would expect the concordance rates to be higher for fraternal twins and adoptive siblings than has been demonstrated. All things considered, the evidence seems to point to the conclusion that ADHD is triggered more by genetic and neurological factors and less by social or environmental ones.

Autism Spectrum Disorder

A seminal paper published in 1943 by psychiatrist Leo Kanner described an unusual neurodevelopmental condition he observed in a group of children. He called this condition early infantile autism, and it was characterized mainly by an inability to form close emotional ties with others, speech and language abnormalities, repetitive behaviors, and an intolerance of minor changes in the environment and in normal routines (Bregman, 2005). What the DSM-5 refers to as autism spectrum disorder today, is a direct extension of Kanner's work.

Autism spectrum disorder is probably the most misunderstood and puzzling of the neurodevelopmental

disorders. Children with this disorder show signs of significant disturbances in three main areas: (a) deficits in social interaction, (b) deficits in communication, and (c) repetitive patterns of behavior or interests. These disturbances appear early in life and cause serious impairments in functioning (APA, 2013). The child with autism spectrum disorder might exhibit deficits in social interaction by not initiating conversations with other children or turning their head away when spoken to. These children do not make eye contact with others and seem to prefer playing alone rather than with others. In a certain sense, it is almost as though these individuals live in a personal and isolated social world others are simply not privy to or able to penetrate. Communication deficits can range from a complete lack of speech, to one word responses (e.g., saying “Yes” or “No” when replying to questions or statements that require additional elaboration), to echoed speech (e.g., parroting what another person says, either immediately or several hours or even days later), to difficulty maintaining a conversation because of an inability to reciprocate others’ comments. These deficits can also include problems in using and understanding nonverbal cues (e.g., facial expressions, gestures, and postures) that facilitate normal communication.

Repetitive patterns of behavior or interests can be exhibited a number of ways. The child might engage in stereotyped, repetitive movements (rocking, head-banging, or repeatedly dropping an object and then picking it up), or she might show great distress at small changes in routine or the environment. For example, the child might throw a temper tantrum if an object is not in its proper place or if a regularly-scheduled activity is rescheduled. In some cases, the person with autism spectrum disorder might show highly restricted and fixated interests that appear to be abnormal in their intensity. For instance, the person might learn and memorize every detail about something even though doing so serves no apparent purpose. Importantly, autism spectrum disorder is not the same thing as intellectual disability, although these two conditions are often comorbid. The DSM-5 specifies that the symptoms of autism spectrum disorder are not caused or explained by intellectual disability.

Life Problems From Autism Spectrum Disorder

Autism spectrum disorder is referred to in everyday language as autism; in fact, the disorder was termed “autistic disorder” in earlier editions of the DSM, and its diagnostic criteria were much narrower than those of autism spectrum disorder. The qualifier “spectrum” in autism spectrum disorder is used to indicate that individuals with the disorder can show a range, or spectrum, of symptoms that vary in their magnitude and severity: some severe, others less severe. The previous edition of the DSM included a diagnosis of Asperger’s disorder, generally recognized as a less severe form of autistic disorder; individuals diagnosed with Asperger’s disorder were described as having average or high intelligence and a strong vocabulary, but exhibiting impairments in social interaction and social communication, such as talking only about their special interests (Wing, Gould, & Gillberg, 2011). However, because research has failed to demonstrate that Asperger’s disorder differs qualitatively from autistic disorder, the DSM-5 does not include it, which is prompting concerns among some parents that their children may no longer be eligible for special services (“Asperger’s Syndrome

Dropped,” 2012). Some individuals with autism spectrum disorder, particularly those with better language and intellectual skills, can live and work independently as adults. However, most do not because the symptoms remain sufficient to cause serious impairment in many realms of life (APA, 2013).

Here is an instructive and poignant video highlighting severe autism: [10 Early Signs of Autism \(UPDATED\)](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://louis.pressbooks.pub/intropsychology/?p=820#oembed-1>

Currently, estimates indicate that nearly 1 in 88 children in the United States has autism spectrum disorder; the disorder is 5 times more common in boys (1 out of 54) than girls (1 out of 252) (CDC, 2012). Rates of autistic spectrum disorder have increased dramatically since the 1980s. For example, California saw an increase of 273% in reported cases from 1987 through 1998 (Byrd, 2002); between 2000 and 2008, the rate of autism diagnoses in the United States increased 78% (CDC, 2012). Although it is difficult to interpret this increase, it is possible that the rise in prevalence is the result of the broadening of the diagnosis, increased efforts to identify cases in the community, and greater awareness and acceptance of the diagnosis. In addition, mental health professionals are now more knowledgeable about autism spectrum disorder and are better equipped to make the diagnosis, even in subtle cases (Novella, 2008).

Why Is the Prevalence Rate of ADHD Increasing?

Many people believe that the rates of ADHD have increased in recent years, and there is evidence to support this contention. In a recent study, investigators found that the parent-reported prevalence of ADHD among children (4–17 years old) in the United States increased by 22% during a 4-year period, from 7.8% in 2003 to 9.5% in 2007 (CDC, 2010). Over time this increase in parent-reported ADHD was observed in all sociodemographic groups and was

reflected by substantial increases in 12 states (Indiana, North Carolina, and Colorado were the top 3). The increases were greatest for older teens (ages 15–17), multiracial and Hispanic children, and children with a primary language other than English. Another investigation found that from 1998–2000 through 2007–2009 the parent-reported prevalence of ADHD increased among U.S. children between the ages of 5–17 years old, from 6.9% to 9.0% (Akinbami, Liu, Pastor, & Reuben, 2011).

A major weakness of both studies was that children were not actually given a formal diagnosis. Instead, parents were simply asked whether or not a doctor or other health-care provider had ever told them their child had ADHD; the reported prevalence rates thus may have been affected by the accuracy of parental memory. Nevertheless, the findings from these studies raise important questions concerning what appears to be a demonstrable rise in the prevalence of ADHD. Although the reasons underlying this apparent increase in the rates of ADHD over time are poorly understood and, at best, speculative, several explanations are viable:

ADHD may be over-diagnosed by doctors who are too quick to medicate children as a behavior treatment.

There is greater awareness of ADHD now than in the past. Nearly everyone has heard of ADHD, and most parents and teachers are aware of its key symptoms. Thus, parents may be quick to take their children to a doctor if they believe their child possesses these symptoms, or teachers may be more likely now than in the past to notice the symptoms and refer the child for evaluation.

The use of computers, video games, iPhones, and other electronic devices has become pervasive among children in the early 21st century, and these devices could potentially shorten children's attentions spans. Thus, what might seem like inattention to some parents and teachers could simply reflect exposure to too much technology.

ADHD diagnostic criteria have changed over time.

Causes of Autism Spectrum Disorder

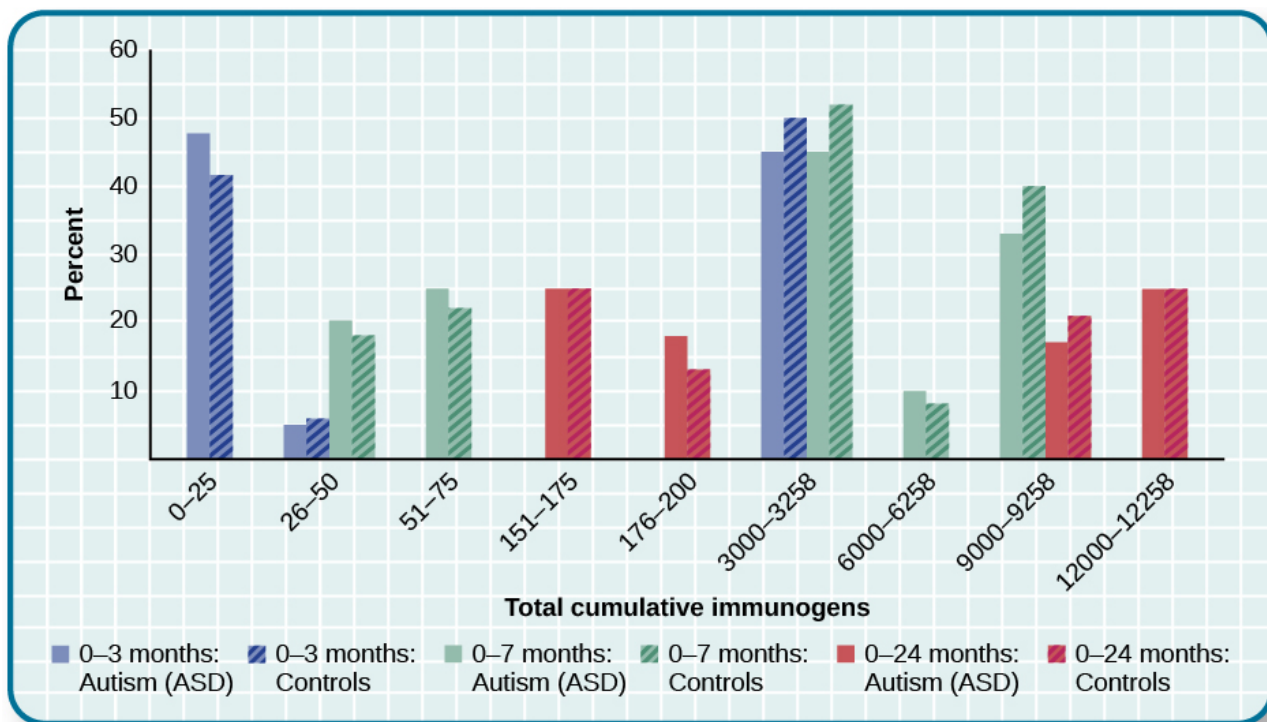
Early theories of autism placed the blame squarely on the shoulders of the child's parents, particularly the mother. Bruno Bettelheim (an Austrian-born American child psychologist who was heavily influenced by Sigmund Freud's ideas) suggested that a mother's ambivalent attitudes and her frozen and rigid emotions toward her child were the main causal factors in childhood autism. In what must certainly stand as one of the more controversial assertions in psychology over the last 50 years, he wrote, "I state my belief that the precipitating factor in infantile autism is the parent's wish that his child should not exist" (Bettelheim, 1967,

p. 125). As you might imagine, Bettelheim did not endear himself to a lot of people with this position; incidentally, no scientific evidence exists supporting his claims.

The exact causes of autism spectrum disorder remain unknown despite massive research efforts over the last two decades (Meek, Lemery-Chalfant, Jahromi, & Valiente, 2013). Autism appears to be strongly influenced by genetics, as identical twins show concordance rates of 60%–90%, whereas concordance rates for fraternal twins and siblings are 5%–10% (Autism Genome Project Consortium, 2007). Many different genes and gene mutations have been implicated in autism (Meek et al., 2013). Among the genes involved are those important in the formation of synaptic circuits that facilitate communication between different areas of the brain (Gauthier et al., 2011). A number of environmental factors are also thought to be associated with increased risk for autism spectrum disorder, at least in part, because they contribute to new mutations. These factors include exposure to pollutants, such as plant emissions and mercury, urban versus rural residence, and vitamin D deficiency (Kinney, Barch, Chayka, Napoleon, & Munir, 2009).

Child Vaccinations and Autism Spectrum Disorder

In the late 1990s, a prestigious medical journal published an article purportedly showing that autism is triggered by the MMR (measles, mumps, and rubella) vaccine. These findings were very controversial and drew a great deal of attention, sparking an international forum on whether children should be vaccinated. In a shocking turn of events, some years later the article was retracted by the journal that had published it after accusations of fraud on the part of the lead researcher. Despite the retraction, the reporting in popular media led to concerns about a possible link between vaccines and autism persisting. A recent survey of parents, for example, found that roughly a third of respondents expressed such a concern (Kennedy, LaVail, Nowak, Basket, & Landry, 2011); and perhaps fearing that their children would develop autism, more than 10% of parents of young children refuse or delay vaccinations (Dempsey et al., 2011). Some parents of children with autism mounted a campaign against scientists who refuted the vaccine-autism link. Even politicians and several well-known celebrities weighed in; for example, actress Jenny McCarthy (who believed that a vaccination caused her son's autism) co-authored a book on the matter. However, there is no scientific evidence that a link exists between autism and vaccinations (Hughes, 2007). Indeed, a recent study compared the vaccination histories of 256 children with autism spectrum disorder with that of 752 control children across three time periods during their first two years of life (birth to 3 months, birth to 7 months, and birth to 2 years) (DeStefano, Price, & Weintraub, 2013). At the time of the study, the children were between 6 and 13 years old, and their prior vaccination records were obtained. Because vaccines contain immunogens (substances that fight infections), the investigators examined medical records to see how many immunogens children received to determine if those children who received more immunogens were at greater risk for developing autism spectrum disorder. The results of this study, clearly demonstrate that the quantity of immunogens from vaccines received during the first two years of life were not at all related to the development of autism spectrum disorder. There is not a relationship between vaccinations and autism spectrum disorders.



In terms of their exposure to immunogens in vaccines, overall, there is not a significant difference between children with autism spectrum disorder and their age-matched controls without the disorder (DeStefano et al., 2013).

Why does concern over vaccines and autism spectrum disorder persist? Since the proliferation of the Internet in the 1990s, parents have been constantly bombarded with online information that can become magnified and take on a life of its own. The enormous volume of electronic information pertaining to autism spectrum disorder, combined with how difficult it can be to grasp complex scientific concepts, can make separating good research from bad challenging (Downs, 2008). Notably, the study that fueled the controversy reported that 8 out of 12 children—according to their parents—developed symptoms consistent with autism spectrum disorder shortly after receiving a vaccination. To conclude that vaccines cause autism spectrum disorder on this basis, as many did, is clearly incorrect for a number of reasons, not the least of which is because correlation does not imply causation, as you’ve learned.

Additionally, as was the case with diet and ADHD in the 1970s, the notion that autism spectrum disorder is caused by vaccinations is appealing to some because it provides a simple explanation for this condition. Like all disorders, however, there are no simple explanations for autism spectrum disorder. Although the research discussed above has shed some light on its causes, science is still a long way from complete understanding of the disorder.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=820#h5p-254>

Summary

Neurodevelopmental disorders are a group of disorders that are typically diagnosed during childhood and are characterized by developmental deficits in personal, social, academic, and intellectual realms; these disorders include attention deficit/hyperactivity disorder (ADHD) and autism spectrum disorder. ADHD is characterized by a pervasive pattern of inattention and/or hyperactive and impulsive behavior that interferes with normal functioning. Genetic and neurobiological factors contribute to the development of ADHD, which can persist well into adulthood and is often associated with poor long-term outcomes. The major features of autism spectrum disorder include deficits in social interaction and communication and repetitive movements or interests. As with ADHD, genetic factors appear to play a prominent role in the development of autism spectrum disorder; exposure to environmental pollutants such as mercury have also been linked to the development of this disorder. Although it is believed by some that autism is triggered by the MMR vaccination, evidence does not support this claim.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=820#h5p-255>

Critical Thinking Questions

Compare the factors that are important in the development of ADHD with those that are important in the development of autism spectrum disorder.

Genetic factors appear to play a major role in the development of both ADHD and autism spectrum disorder: studies show higher rates of concordance among identical twins than among fraternal twins for both disorders. In ADHD, genes that regulate dopamine have been implicated; in autism spectrum disorder, de novo genetic mutations appear to be important. Imaging studies suggest that abnormalities in the frontal lobes may be important in the development of ADHD. Parenting practices are not connected to the development of either disorder. Although environmental toxins are generally unimportant in the development of ADHD, exposure to cigarette smoke during the prenatal period has been linked to the development of the disorder; a number of environmental factors are thought to be associated with an increased risk for autism spectrum disorder: exposure to pollutants, an urban versus rural residence, and vitamin D deficiency. Although some people continue to believe that MMR vaccinations can cause autism spectrum disorder (due to an influential paper that was later retracted), there is no scientific evidence that supports this assertion.

Personal Application Question

Discuss the characteristics of autism spectrum disorder with a few of your friends or members of your family (choose friends or family members who know little about the disorder) and ask them if they think the cause is due to bad parenting or vaccinations. If they indicate that they believe either to be true, why do you think this might be the case? What would be your response?

Media Attributions

- “[10 Early Signs of Autism \(UPDATED\)](#)” by [Autism Family](#). Standard YouTube License.

80.

REFERENCES

- Abela, J. R., & Hankin, B. L. (2011). Rumination as a vulnerability factor to depression during the transition from early to middle adolescence: A multiwave longitudinal study. *Journal of Abnormal Psychology, 120*, 259–271.
- Abramowitz, J. S., & Siqueland, L. (2013). Obsessive-compulsive disorder. In L. G. Castonguay & T. F. Oltmanns (Eds.), *Psychopathology: From science to clinical practice* (pp. 143–171). New York, NY: Guilford Press.
- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review, 96*, 358–372.
- Affif, T. O., Mather, A., Boman, J., Fleisher, W., Enns, M. W., MacMillan, H., & Sareen, J. (2010). Childhood adversity and personality disorder: Results from a nationally representative population-based survey. *Journal of Psychiatric Research, 45*, 814–822.
- Agerbo, E., Nordentoft, M., & Mortensen, P. B. (2002). Familial, psychiatric, and socioeconomic risk factors for suicide in young people: Nested case-control study. *British Medical Journal, 325*, 74–77.
- Aghukwa, C. N. (2012). Care seeking and beliefs about the cause of mental illness among Nigerian psychiatric patients and their families. *Psychiatric Services, 63*, 616–618.
- Aikins, D. E., & Craske, M. G. (2001). Cognitive theories of generalized anxiety disorder. *Psychiatric Clinics of North America, 24*, 57–74.
- Akinbami, L. J., Liu, X., Pastor, P., & Reuben, C. A. (2011, August). Attention deficit hyperactivity disorder among children aged 5–17 years in the United States, 1998–2009 (NCHS data brief No. 70). Hyattsville, MD: National Center for Health Statistics. Retrieved from <http://www.cdc.gov/nchs/data/databriefs/db70.pdf>
- Alden, L. E., & Bieling, P. (1998). Interpersonal consequences in the pursuit of safety. *Behaviour Research and Therapy, 36*, 53–64.
- Alegria, A. A., Blanco, C., Petry, N. M., Skodol, A. E., Liu, S. M., & Grant, B. (2013). Sex differences in antisocial personality disorder: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Personality Disorders: Theory, Research, and Treatment, 4*, 214–222.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Andreasen, N. C. (1987). The diagnosis of schizophrenia. *Schizophrenia Bulletin, 13*, 9–22.

- Andréasson, S., Allbeck, P., Engström, A., & Rydberg, U. (1987). Cannabis and schizophrenia: A longitudinal study of Swedish conscripts. *Lancet*, *330*, 1483–1486.
- Asberg, M., Thorén, P., Träskman, L., Bertilsson, L., & Ringberger, V. (1976). “Serotonin depression”—a biochemical subgroup within the affective disorders? *Science*, *191*(4226), 478–480. doi:10.1126/science.1246632
- Asperger’s syndrome dropped from psychiatrists’ handbook the DSM: DSM-5, latest revision of Diagnostic and Statistical Manual, merges Asperger’s with autism and widens dyslexia category. (2012, December 1). *The Guardian*. Retrieved from <http://www.theguardian.com/society/2012/dec/02/aspergers-syndrome-dropped-psychiatric-dsm>
- Autism Genome Project Consortium. (2007). Mapping autism risk loci using genetic linkage and chromosomal rearrangements. *Nature Genetics*, *39*, 319–328.
- Baes, C. V. W., Tofoli, S. M. C., Martins, C. M. S., & Juruena, M. F. (2012). Assessment of the hypothalamic–pituitary–adrenal axis activity: Glucocorticoid receptor and mineralocorticoid receptor function in depression with early life stress—a systematic review. *Acta Neuropsychiatrica*, *24*, 4–15.
- Baker, L. A., Bezdjian, S., & Raine, A. (2006). Behavioral genetics: The science of antisocial behavior. *Law and Contemporary Problems*, *69*, 7–46.
- Barbarese, W. J., Colligan, R. C., Weaver, A. L., Voigt, R. G., Killian, J. M., & Katusic, S. K. (2013). Mortality, ADHD, and psychosocial adversity in adults with childhood ADHD: A prospective study. *Pediatrics*, *131*, 637–644.
- Barker, P. (2010). *The legacy of Thomas Szasz*. Retrieved from <http://www.centerforindependentthought.org/SzaszLegacy.html>
- Barkley, R. A. (2006). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York, NY: Guilford Press.
- Barkley, R. A., Fischer, M., Smallish, L., & Fletcher, K. (2002). The persistence of attention-deficit/hyperactivity disorder into young adulthood as a function of reporting source and definition of disorder. *Journal of Abnormal Psychology*, *111*, 279–289.
- Battista, S. R., & Kocovski, N. L. (2010). Exploring the effect of alcohol on post-event processing specific to a social event. *Cognitive Behaviour Therapy*, *39*, 1–10.
- Baumeister, A. A., & Hawkins, M. F. (2004). The serotonin hypothesis of schizophrenia: A historical case study on the heuristic value of theory in clinical neuroscience. *Journal of the History of the Neurosciences*, *13*, 277–291.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York, NY: International Universities Press.
- Beck, A. T. (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *American Journal of Psychiatry*, *165*, 969–977.
- Berman, A. L. (2009). School-based suicide prevention: Research advances and practice implications [Commentary]. *School Psychology Review*, *38*, 233–238.

- Bettelheim, B. (1967). *The empty fortress: Infantile autism and the birth of the self*. New York, NY: Free Press.
- Beucke, J. C., Sepulcre, J., Talukdar, T., Linnman, C., Zschenderlein, K., Endrass, T., . . . Kathman, N. (2013). Abnormally high degree connectivity of the orbitofrontal cortex in obsessive-compulsive disorder. *JAMA Psychiatry*, 70, 619–629.
- Biederman, J., Faraone, S. V., Hirshfeld-Becker, D. R., Friedman, D., Robin, J. A., & Rosenbaum, J. F. (2001). Patterns of psychopathology and dysfunction in high-risk children of parents with panic disorder and major depression. *American Journal of Psychiatry*, 158, 49–57.
- Bolton, D., Rijdsdijk, F., O'Connor, T. G., Perrin, S., & Eley, T. C. (2007). Obsessive-compulsive disorder, tics and anxiety in 6-year-old twins. *Psychological Medicine*, 37, 39–48.
- Bourguignon, E. (1970). Hallucinations and trance: An anthropologist's perspective. In W. Keup (Ed.), *Origins and mechanisms of hallucination* (pp. 183–190). New York, NY: Plenum Press.
- Bouton, M. E., Mineka, S., & Barlow, D. H. (2001). A modern learning theory perspective on the etiology of panic disorder. *Psychological Review*, 108, 4–32.
- Bramsen, I., Dirkzwager, A. J. E., & van der Ploeg, H. M. (2000). Predeployment personality traits and exposure to trauma as predictors of posttraumatic stress symptoms: A prospective study of former peacekeepers. *American Journal of Psychiatry*, 157, 1115–1119.
- Bregman, J. D. (2005). Definitions and characteristics of the spectrum. In D. Zager (Ed.), *Autism spectrum disorders: Identification, education, and treatment* (3rd ed., pp. 3–46). Mahwah, NJ: Erlbaum.
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68, 748–756.
- Bremner, J. D., Krystal, J. H., Southwick, S. M., & Charney, D. S. (1996). Noradrenergic mechanisms in stress and anxiety: I. preclinical studies. *Synapse*, 23, 28–38.
- Brown, A. S., Begg, M. D., Gravenstein, S., Schaefer, C. A., Wyatt, R. J., Breshnahan, M., . . . Susser, E. S. (2004). Serologic evidence of prenatal influenza in the etiology of schizophrenia. *Archives of General Psychiatry*, 61, 774–780.
- Boland, R. J., & Keller, M. B. (2009). Course and outcome of depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 23–43). New York, NY: Guilford Press.
- Brent, D. A., & Bridge, J. (2003). Firearms availability and suicide: A review of the literature. *American Behavioral Scientist*, 46, 1192–1210.
- Brown, G. W., & Harris, T. O. (1989). Depression. In G. W. Brown and T. O. Harris (Eds.), *Life events and illness* (pp. 49–93). New York, NY: Guilford Press.
- Brown, G. W., Ban, M., Craig, T. J. K., Harris, T. O., Herbert, J., & Uher, R. (2013). Serotonin transporter length polymorphism, childhood maltreatment, and chronic depression: A specific gene-environment interaction. *Depression and Anxiety*, 30, 5–13.
- Buchanan-Barker, P., Barker, P. (2009, February). The convenient myth of Thomas Szasz. *Journal of Psychiatric and Mental Health Nursing*, 16(1): 87–95. doi:10.1111/j.1365-2850.2008.01310.x
- Buchsbaum, M. S., Nuechterlein, K. H., Haier, R. J., Wu, J., Sicotte, N., Hazlett, E., . . . Guich, S. (1990).

Glucose metabolic rate in normal and schizophrenics during the continuous performance test assessed by positron emission tomography. *British Journal of Psychiatry*, 156, 216–227.

Burt, S. A. (2009). Rethinking environmental contributions to child and adolescent psychopathology: A meta-analysis of shared environmental influences. *Psychological Bulletin*, 135, 608–637.

Butler, L. D., & Nolen-Hoeksema, S. (1994). Gender differences in responses to depressed mood in a college sample. *Sex Roles*, 30, 331–346.

Byrd, R. (2002, October 17). Report to the legislature on the principal findings from the epidemiology of autism in California: A comprehensive pilot study. Retrieved from <http://www.dds.ca.gov/Autism/MindReport.cfm>

Cadoret, R., Yates, W., Ed., T., Woodworth, G., & Stewart, M. (1995). Genetic environmental interactions in the genesis of aggressivity and conduct disorders. *Archives of General Psychiatry*, 52, 916–924.

Cannon, M., Jones, P. B., & Murray, R. M. (2002). Obstetric complications and schizophrenia: Historical and meta-analytic review. *American Journal of Psychiatry*, 159, 1080–1092.

Casadio, P., Fernandes, C., Murray, R. M., & Di Forti, M. (2011). Cannabis use in young people: The risk for schizophrenia. *Neuroscience and Biobehavioral Reviews*, 35, 1779–1787.

Cardena, E., & Gleaves, D. H. (2006). Dissociative disorders. In M. Hersen, S. M. Turner, & D. C. Beidel (Eds.), *Adult psychopathology and diagnosis* (pp. 473–503). Hoboken, NJ: John Wiley & Sons.

Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., Poulton, R. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, 301(5631), 386–389.

Centers for Disease Control and Prevention. (2010, November 12). Increasing prevalence of parent-reported attention-deficit/hyperactivity disorder among children, United States, 2003–2007. *Morbidity and Mortality Weekly Report*, 59(44), 1439–1443.

Centers for Disease Control and Prevention. (2012). Suicide: Facts at a glance. Retrieved from http://www.cdc.gov/ViolencePrevention/pdf/Suicide_DataSheet-a.pdf

Centers for Disease Control and Prevention. (2012, March 30). Prevalence of autism spectrum disorders—autism and developmental disabilities monitoring network, 14 sites, United States, 2008. *Morbidity and Mortality Weekly Report: Surveillance Summaries*, 61(3), 1–19. Retrieved from <http://www.cdc.gov/mmwr/pdf/ss/ss6103.pdf>

Centers for Disease Control and Prevention. (2013a). *Definitions: Self-directed violence*. Retrieved from <http://www.cdc.gov/violenceprevention/suicide/definitions.html>

Centers for Disease Control and Prevention. (2013b). *National suicide statistics at a glance: Trends in suicide rates among both sexes, by age group, United States, 1991–2009*. Retrieved from <http://www.cdc.gov/violenceprevention/suicide/statistics/trends02.html>

Charney, D. S., Woods, S. W., Nagy, L. M., Southwick, S. M., Krystal, J. H., & Heninger, G. R. (1990). Noradrenergic function in panic disorder [Supplemental material]. *Journal of Clinical Psychiatry*, 51, 5–11.

Clark, D. M. (1996). Panic disorder: From theory to therapy. In R. M. Rapee (Ed.), *Current controversies in the anxiety disorders* (pp. 318–344). New York, NY: Guilford Press.

- Clauss, J. A., & Blackford, J. U. (2012). Behavioral inhibition and risk for developing social anxiety disorder: A meta-analytic study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51(10), 1066–1075.
- Clegg, J. W. (2012). Teaching about mental health and illness through the history of the DSM. *History of Psychology*, 15, 364–370.
- Compton, W. M., Conway, K. P., Stinson, F. S., Colliver, J. D., & Grant, B. F. (2005). Prevalence, correlates, and comorbidity of DSM-IV antisocial personality syndromes and alcohol and specific drug use disorders in the United States: Results from the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry*, 66, 677–685.
- Cook, M., & Mineka, S. (1989). Observational conditioning of fear to fear-relevant versus fear-irrelevant stimuli in rhesus monkeys. *Journal of Abnormal Psychology*, 98, 448–459.
- Craske, M. G. (1999). *Anxiety disorders: Psychological approaches to theory and treatment*. Boulder, CO: Westview Press.
- Crosby, A. E., Ortega, L., & Melanson, C. (2011). *Self-directed violence surveillance: Uniform definitions and recommended data elements, version 1.0*. Retrieved from <http://www.cdc.gov/violenceprevention/pdf/self-directed-violence-a.pdf>
- Dalenberg, C. J., Brand, B. L., Gleaves, D. H., Dorahy, M. J., Loewenstein, R. J., Cardeña, E., . . . Spiegel, D. (2012). Evaluation of the evidence for the trauma and fantasy models of dissociation. *Psychological Bulletin*, 138, 550–588.
- Sometimes Interesting: Weird, Forgotten, and Sometimes Interesting Things. (2011, July 2). Dancing mania [Web log post]. Retrieved from <http://sometimes-interesting.com/2011/07/02/dancing-mania/>
- Davidson, R. J., Pizzagalli, D. A., & Nitschke, J. B. (2009). Representation and regulation of emotional depression: Perspectives from cognitive neuroscience. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 218–248). New York, NY: Guilford Press.
- Davis, K. L., Kahn, R. S., Ko, G., & Davidson, M. (1991). Dopamine in schizophrenia: A review and reconceptualization. *American Journal of Psychiatry*, 148, 1474–1486.
- Decety, J., Skelly, L. R., & Kiehl, K. A. (2013). Brain response to empathy-eliciting scenarios involving pain in incarcerated individuals with psychopathy. *JAMA Psychiatry*, 70, 638–645.
- Demos, J. (1983). *Entertaining Satan: Witchcraft and the culture of early New England*. New York, NY: Oxford University Press.
- Dempsey, A. F., Schaffer, S., Singer, D., Butchart, A., Davis, M., & Freed, G. L. (2011). Alternative vaccination schedule preferences among parents of young children. *Pediatrics*, 128, 848–856.
- DeStefano, F., Price, C. S., & Weintraub, E. S. (2013). Increasing exposures to antibody-stimulating proteins and polysaccharides in vaccines is not associated with risk of autism. *The Journal of Pediatrics*, 163, 561–567.
- DiGrande, L., Perrin, M. A., Thorpe, L. E., Thalji, L., Murphy, J., Wu, D., . . . Brackbill, R. M. (2008). Posttraumatic stress symptoms, PTSD, and risk factors among lower Manhattan residents 2–3 years after the September 11, 2001 terrorist attacks. *Journal of Traumatic Stress*, 21, 264–273.

- DNA project aims to count Scots redheads. (2012, November 7). *British Broadcast Corporation [BBC]*. Retrieved from <http://www.bbc.com/news/uk-scotland-20237511>
- Downs, M. (2008, March 31). Autism-vaccine link: Evidence doesn't dispel doubts [Web log post]. Retrieved from www.webmd.com/brain/autism/searching-for-answers/vaccines-autism
- Dozois, D. J. A., & Beck, A. T. (2008). Cognitive schemas, beliefs and assumptions. In K. S. Dobson & D. J. A. Dozois (Eds.), *Risk factors in depression* (pp. 121–143). New York, NY: Academic Press.
- Drevets, W. C., Bogers, W. U., & Raichle, M. E. (2002). Functional anatomical correlates of antidepressant drug treatment assessed using PET measures of regional glucose metabolism. *European Neuropsychopharmacology*, 12, 527–544.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319–345.
- Etzersdorfer, E., Voracek, M., & Sonneck, G. (2004). A dose-response relationship between imitational suicides and newspaper distribution. *Archives of Suicide Research*, 8, 137–145.
- Fabrega, H. (2007). How psychiatric conditions were made. *Psychiatry*, 70, 130–153.
- Fitzgerald, P. B., Laird, A. R., Maller, J., & Daskalakis, Z. J. (2008). A meta-analytic study of changes in brain activation in depression. *Human Brain Mapping*, 29, 683–695.
- Fields, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. *Infant Behavior and Development*, 33, 1–6.
- Fisher, C. (2010, February 11). DSM-5 development process included emphasis on gender and cultural sensitivity [Web log post]. Retrieved from <http://www.bmedreport.com/archives/9359>
- Fleischman, A., Bertolote, J. M., Belfer, M., & Beautrais, A. (2005). Completed suicide and psychiatric diagnoses in young people: A critical examination of the evidence. *American Journal of Orthopsychiatry*, 75, 676–683.
- Foote, B., Smolin, Y., Kaplan, M., Legatt, M. E., & Lipschitz, D. (2006). Prevalence of dissociative disorders in psychiatric outpatients. *American Journal of Psychiatry*, 163, 623–629.
- Fox, N. A., Henderson, H. A., Marshall, P. J., Nichols, K. E., & Ghera, M. M. (2005). Behavioral inhibition: Linking biology and behavior within a developmental framework. *Annual Review of Psychology*, 56, 235–262.
- Frances, A. (2012, December 2). DSM 5 is guide not bible—ignore its ten worst changes [Web log post]. Retrieved from <http://www.psychologytoday.com/blog/dsm5-in-distress/201212/dsm-5-is-guide-not-bible-ignore-its-ten-worst-changes>
- Freeman, A., Stone, M., Martin, D., & Reinecke, M. (2005). A review of borderline personality disorder. In A. Freeman, M. Stone, D. Martin, & M. Reinecke (Eds.), *Comparative treatments for borderline personality disorder* (pp. 1–20). New York, NY: Springer.
- Fung, M. T., Raine, A., Loeber, R., Lynam, D. R., Steinhauer, S. R., Venables, P. H., & Stouthamer-Loeber, M. (2005). Reduced electrodermal activity in psychopathy-prone adolescents. *Journal of Abnormal Psychology*, 114, 187–196.
- Fusar-Poli, P., Borgwardt, S., Bechdolf, A., Addington, J., Riecher-Rössler, A., Schultze-Lutter, F., . . .

- Yung, A. (2013). The psychosis high-risk state: A comprehensive state-of-the-art review. *Archives of General Psychiatry*, 70, 107–120.
- Gauthier, J., Siddiqui, T. J., Huashan, P., Yokomaku, D., Hamdan, F. F., Champagne, N., . . . Rouleau, G.A. (2011). Truncating mutations in NRXN2 and NRXN1 in autism spectrum disorders and schizophrenia. *Human Genetics*, 130, 563–573.
- Gizer, I. R., Ficks, C., & Waldman, I. D. (2009). Candidate gene studies of ADHD: A meta-analytic review. *Human Genetics*, 126, 51–90.
- Goldstein, A. J., & Chambless, D. L. (1978). A reanalysis of agoraphobia. *Behavior Therapy*, 9, 47–59.
- Goldstein, J. M., Buka, S. L., Seidman, L. J., & Tsuang, M. T. (2010). Specificity of familial transmission of schizophrenia psychosis spectrum and affective psychoses in the New England family study's high-risk design. *Archives of General Psychiatry*, 67, 458–467.
- Good, B. J., & Hinton, D. E. (2009). Panic disorder in cross-cultural and historical perspective. In D. E. Hinton & B. J. Good (Eds.), *Culture and panic disorder* (pp. 1–28). Stanford, CA: Stanford University Press.
- Goodman, S. H., & Brand, S. R. (2009). Depression and early adverse experiences. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 249–274). New York, NY: Guilford Press.
- Gotlib, I. H., & Joormann, J. (2010). Cognition and depression: Current status and future directions. *Annual Review of Clinical Psychology*, 6, 285–312.
- Gottesman, I. I. (2001). Psychopathology through a life span-genetic prism. *American Psychologist*, 56, 867–878.
- Graybiel, A. N., & Rauch, S. L. (2000). Toward a neurobiology of obsessive-compulsive disorder. *Neuron*, 28, 343–347.
- Green, M. F. (2001). *Schizophrenia revealed: From neurons to social interactions*. New York, NY: W. W. Norton.
- Hackmann, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in social phobia. *Behaviour Research and Therapy*, 38, 601–610.
- Halligan, S. L., Herbert, J., Goodyer, I., & Murray, L. (2007). Disturbances in morning cortisol secretion in association with maternal postnatal depression predict subsequent depressive symptomatology in adolescents. *Biological Psychiatry*, 62, 40–46.
- Hare, R. D. (1965). Temporal gradient of fear arousal in psychopaths. *Journal of Abnormal Psychology*, 70, 442–445.
- Hasin, D. S., Fenton, M. C., & Weissman, M. M. (2011). Epidemiology of depressive disorders. In M. T. Tsuang, M. Tohen, & P. Jones (Eds.), *Textbook of psychiatric epidemiology* (pp. 289–309). Hoboken, NJ: John Wiley & Sons.
- Herman, J. (1997). *Trauma and recovery: The aftermath of violence—from domestic abuse to political terror*. New York, NY: Basic Books.
- Herrenkohl, T. I., Maguin, E., Hill, K. G., Hawkins, J. D., Abbott, R. D., & Catalano, R. (2000). Developmental risk factors for youth violence. *Journal of Adolescent Health*, 26, 176–186.

- Heston, L. L. (1966). Psychiatric disorders in foster home reared children of schizophrenic mothers. *British Journal of Psychiatry*, 112, 819–825.
- Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001). A review and meta-analysis of the genetic epidemiology of anxiety disorders. *The American Journal of Psychiatry*, 158, 1568–1578.
- Holsboer, F., & Ising, M. (2010). Stress hormone regulation: Biological role and translation into therapy. *Annual Review of Psychology*, 61, 81–109.
- Howes, O. D., & Kapur, S. (2009). The dopamine hypothesis of schizophrenia: Version III—The final common pathway. *Schizophrenia Bulletin*, 35, 549–562.
- Hoza, B., Mrug, S., Gerdes, A. C., Hinshaw, S. P., Bukowski, W. M., Gold, J. A., . . . Arnold, L. E. (2005). What aspects of peer relationships are impaired in children with ADHD? *Journal of Consulting and Clinical Psychology*, 73, 411–423.
- Hughes, V. (2007). Mercury rising. *Nature Medicine*, 13, 896–897.
- Jellinek, M. S., & Herzog, D. B. (1999). The child. In A. M. Nicholi, Jr. (Ed.), *The Harvard guide to psychiatry* (pp. 585–610). Cambridge, MA: The Belknap Press of Harvard University.
- Johnson, J. G., Cohen, P., Kasen, S., & Brook, J. S. (2006). Dissociative disorders among adults in the community, impaired functioning, and axis I and II comorbidity. *Journal of Psychiatric Research*, 40, 131–140.
- Joormann, J. (2009). Cognitive aspects of depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 298–321). New York, NY: Guilford Press.
- Joyce, P. R., McKenzie, J. M., Luty, S. E., Mulder, R. T., Carter, J. D., Sullivan, P. F., & Cloninger, C. R. (2003). Temperament, childhood environment, and psychopathology as risk factors for avoidant and borderline personality disorders. *Australian and New Zealand Journal of Psychiatry*, 37, 756–764.
- Judd, L. L. (2012). Dimensional paradigm of the long-term course of unipolar major depressive disorder. *Depression and Anxiety*, 29, 167–171.
- Kagan, J., Reznick, J. S., & Snidman, N. (1988). Biological bases of childhood shyness. *Science*, 240, 167–171.
- Katzelnick, D. J., Kobak, K. A., DeLeire, T., Henk, H. J., Greist, J. H., Davidson, J. R. T., . . . Helstad, C. P. (2001). Impact of generalized social anxiety disorder in managed care. *The American Journal of Psychiatry*, 158, 1999–2007.
- Kendler, K. S., Hettema, J. M., Butera, F., Gardner, C. O., & Prescott, C. A. (2003). Life event dimensions of loss, humiliation, entrapment, and danger in the prediction of onsets of major depression and generalized anxiety. *Archives of General Psychiatry*, 60, 789–796.
- Kennedy, A., LaVail, K., Nowak, G., Basket, M., & Landry, S. (2011). Confidence about vaccines in the United States: Understanding parents' perceptions. *Health Affairs*, 30, 1151–1159.
- Kessler, R. C. (1997). The effects of stressful life events on depression. *Annual Review of Psychology*, 48, 191–214.
- Kessler, R. C. (2003). Epidemiology of women and depression. *Journal of Affective Disorders*, 74, 5–13.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. P., & Walters, E. F. (2005). Lifetime

prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62, 593–602.

Kessler, R. C., Chiu, W. T., Jin, R., Ruscio, A. M., Shear, K., & Walters, E. (2006). The epidemiology of panic attacks, panic disorder, and agoraphobia in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 63, 415–424.

Kessler, R. C., Galea, S., Gruber, M. J., Sampson, N. A., Ursano, R. J., & Wessely, S. (2008). Trends in mental illness and suicidality after Hurricane Katrina. *Molecular Psychiatry*, 13, 374–384.

Kessler, R. C., Ruscio, A. M., Shear, K., & Wittchen, H. U. (2009). Epidemiology of anxiety disorders. In M. B. Stein & T. Steckler (Eds.), *Behavioral neurobiology of anxiety and its treatment* (pp. 21–35). New York, NY: Springer.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52, 1048–1060.

Kessler, R. C., & Wang, P. S. (2009). Epidemiology of depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 5–22). New York, NY: Guilford Press.

Khashan, A. S., Abel, K. M., McNamee, R., Pedersen, M. G., Webb, R., Baker, P., . . . Mortensen, P. B. (2008). Higher risk of offspring schizophrenia following antenatal maternal exposure to severe adverse life events. *Archives of General Psychiatry*, 65, 146–152.

Kinney, D. K., Barch, D. H., Chayka, B., Napoleon, S., & Munir, K. M. (2009). Environmental risk factors for autism: Do they help or cause de novo genetic mutations that contribute to the disorder? *Medical Hypotheses*, 74, 102–106.

Kleim, B., Gonzalo, D., & Ehlers, A. (2011). The Depressive Attributions Questionnaire (DAQ): Development of a short self-report measure of depressogenic attributions. *Journal of Psychopathology and Behavioral Assessment*, 33, 375–385.

Klein, R. G., Mannuzza, S., Olazagasti, M. A. R., Roizen, E., Hutchison, J. A., Lashua, E. C., & Castellanos, F. X. (2012). Clinical and functional outcome of childhood attention-deficit/hyperactivity disorder 33 years later. *Archives of General Psychiatry*, 69, 1295–1303.

Koenen, K. C., Stellman, J. M., Stellman, S. D., & Sommer, J. F. (2003). Risk factors for course of posttraumatic stress disorder among Vietnam veterans: A 14-year follow-up of American Legionnaires. *Journal of Consulting and Clinical Psychology*, 71, 980–986.

Kopell, B. H., & Greenberg, B. D. (2008). Anatomy and physiology of the basal ganglia: Implications for DBS in psychiatry. *Neuroscience and Biobehavioral Reviews*, 32, 408–422.

Large, M., Sharma, S., Compton, M. T., Slade, T., & Nielssen, O. (2011). Cannabis use and earlier onset of psychosis: A systematic meta-analysis. *Archives of General Psychiatry*, 68, 555–561.

Lasalvia, A., Zoppei, S., Van Bortel, T., Bonetto, C., Cristofalo, D., Wahlbeck, K., Thornicroft, G. (2013). Global pattern of experienced and anticipated discrimination reported by people with major depressive disorder: A cross-sectional survey. *The Lancet*, 381, 55–62.

- Lawrie, S. M., & Abukmeil, S. S. (1998). Brain abnormality in schizophrenia: A systematic and quantitative review of volumetric magnetic resonance imaging studies. *British Journal of Psychiatry*, 172, 110–120.
- LeMoult, J., Castonguay, L. G., Joormann, J., & McAleavey, A. (2013). Depression. In L. G. Castonguay & T. F. Oltmanns (Eds.), *Psychopathology: From science to clinical practice* (pp. 17–61). New York, NY: Guilford Press.
- Lezenweger, M. F., Lane, M. C., Loranger, A. W., & Kessler, R. C. (2007). DSM-IV personality disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, 62, 553–564.
- Lilienfeld, S. O., & Marino, L. (1999). Essentialism revisited: Evolutionary theory and the concept of mental disorder. *Journal of Abnormal Psychology*, 108, 400–411.
- Linnet, K. M., Dalsgaard, S., Obel, C., Wisborg, K., Henriksen, T. B., Rodriquez, A., . . . Jarvelin, M. R. (2003). Maternal lifestyle factors in pregnancy risk of attention deficit hyperactivity disorder and associated behaviors: A review of current evidence. *The American Journal of Psychiatry*, 160, 1028–1040.
- Livesley, J. (2008). Toward a genetically-informed model of borderline personality disorder. *Journal of Personality Disorders*, 22, 42–71.
- Livesley, J., & Jang, K. L. (2008). The behavioral genetics of personality disorders. *Annual Review of Clinical Psychology*, 4, 247–274.
- Loe, I. M., & Feldman, H. M. (2007). Academic and educational outcomes of children with ADHD. *Journal of Pediatric Psychology*, 32, 643–654.
- Luxton, D. D., June, J. D., & Fairall, J. M. (2012, May). Social media and suicide: A public health perspective [Supplement 2]. *American Journal of Public Health*, 102(S2), S195–S200. doi:10.2105/AJPH.2011.300608
- Mackin, P., & Young, A. H. (2004, May 1). The role of cortisol and depression: Exploring new opportunities for treatments. *Psychiatric Times*. Retrieved from <http://www.psychiatrictimes.com/articles/role-cortisol-and-depression-exploring-new-opportunities-treatments>
- Maher, W. B., & Maher, B. A. (1985). Psychopathology: I. from ancient times to the eighteenth century. In G. A. Kimble & K. Schlesinger (Eds.), *Topics in the history of psychology: Volume 2* (pp. 251–294). Hillsdale, NJ: Erlbaum.
- Mann, J. J., (2003). Neurobiology of suicidal behavior. *Nature Reviews Neuroscience*, 4, 819–828.
- Marker, C. D. (2013, March 3). Safety behaviors in social anxiety: Playing it safe in social anxiety [Web log post]. Retrieved from <http://www.psychologytoday.com/blog/face-your-fear/201303/safety-behaviors-in-social-anxiety>
- Martens, E. J., de Jonge, P., Na, B., Cohen, B. E., Lett, H., & Whooley, M. A. (2010). Scared to death? Generalized anxiety disorder and cardiovascular events in patients with stable coronary heart disease. *Archives of General Psychiatry*, 67, 750–758.
- Mataix-Cols, D., Frost, R. O., Pertusa, A., Clark, L. A., Saxena, S., Leckman, J. F., . . . Wilhelm, S. (2010). Hoarding disorder: A new diagnosis for DSM-V? *Depression and Anxiety*, 27, 556–572.
- Mayes, R., & Horowitz, A. V. (2005). DSM-III and the revolution in the classification of mental illness. *Journal of the History of the Behavioral Sciences*, 41, 249–267.

- Mazure, C. M. (1998). Life stressors as risk factors in depression. *Clinical Psychology: Science and Practice*, 5, 291–313.
- Marshal, M. P., & Molina, B. S. G. (2006). Antisocial behaviors moderate the deviant peer pathway to substance use in children with ADHD. *Journal of Clinical Child and Adolescent Psychology*, 35, 216–226.
- McCabe, K. (2010, January 24). Teen's suicide prompts a look at bullying. *Boston Globe*. Retrieved from <http://www.boston.com>
- McCabe, R. E., Antony, M. M., Summerfeldt, L. J., Liss, A., & Swinson, R. P. (2003). Preliminary examination of the relationship between anxiety disorders in adults and self-reported history of teasing or bullying experiences. *Cognitive Behaviour Therapy*, 32, 187–193.
- McCann, D., Barrett, A., Cooper, A., Crumpler, D., Dalen, L., Grimshaw, K., . . . Stevenson, J. (2007). Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: A randomised, double-blinded, placebo-controlled trial. *The Lancet*, 370(9598), 1560–1567.
- McEwen, B. S. (2005). Glucocorticoids, depression, and mood disorders: Structural remodeling in the brain. *Metabolism: Clinical and Experimental*, 54, 20–23.
- McNally, R. J. (2003). *Remembering trauma*. Cambridge, MA: Harvard University Press.
- Meek, S. E., Lemery-Chalfant, K., Jahromi, L. D., & Valiente, C. (2013). A review of gene-environment correlations and their implications for autism: A conceptual model. *Psychological Review*, 120, 497–521.
- Merikangas, K. R., & Tohen, M. (2011). Epidemiology of bipolar disorder in adults and children. In M. T. Tsuang, M. Tohen, & P. Jones (Eds.), *Textbook of psychiatric epidemiology* (pp. 329–342). Hoboken, NJ: John Wiley & Sons.
- Merikangas, K. R., Jin, R., He, J. P., Kessler, R. C., Lee, S., Sampson, N. A., Zarkov, Z. (2011). Prevalence and correlates of bipolar spectrum disorder in the World Mental Health Survey Initiative. *Archives of General Psychiatry*, 68, 241–251.
- Mezzich, J. E. (2002). International surveys on the use of ICD-10 and related diagnostic systems. *Psychopathology*, 35, 72–75.
- Michaud, K., Matheson, K., Kelly, O., & Anisman, H. (2008). Impact of stressors in a natural context on release of cortisol in healthy adult humans: A meta-analysis. *Stress*, 11, 177–197.
- Mineka, S., & Cook, M. (1993). Mechanisms involved in the observational conditioning of fear. *Journal of Experimental Psychology: General*, 122, 23–38.
- Moffitt, T. E., Caspi, A., Harrington, H., Milne, B. J., Melchior, M., Goldberg, D., & Poulton, R. (2007). Generalized anxiety disorder and depression: Childhood risk factors in a birth cohort followed to age 32. *Psychological Medicine*, 37, 441–452.
- Moitra, E., Beard, C., Weisberg, R. B., & Keller, M. B. (2011). Occupational impairment and social anxiety disorder in a sample of primary care patients. *Journal of Affective Disorders*, 130, 209–212.
- Molina, B. S. G., & Pelham, W. E. (2003). Childhood predictors of adolescent substance abuse in a longitudinal study of children with ADHD. *Journal of Abnormal Psychology*, 112, 497–507.

- Moore, T. H., Zammit, S., Lingford-Hughes, A., Barnes, T. R., Jones, P. B., Burke, M., & Lewis, G. (2007). Cannabis use and risk of psychotic or affective mental health outcomes. *Lancet*, *370*, 319–328.
- Morris, E. P., Stewart, S. H., & Ham, L. S. (2005). The relationship between social anxiety disorder and alcohol use disorders: A critical review. *Clinical Psychology Review*, *25*, 734–760.
- Mowrer, O. H. (1960). *Learning theory and behavior*. New York, NY: John Wiley & Sons.
- Nader, K. (2001). Treatment methods for childhood trauma. In J. P. Wilson, M. J. Friedman, & J. D. Lindy (Eds.), *Treating psychological trauma and PTSD* (pp. 278–334). New York, NY: Guilford Press.
- Nanni, V., Uher, R., & Danese, A. (2012). Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: A meta-analysis. *American Journal of Psychiatry*, *169*, 141–151.
- Nathan, D. (2011). *Sybil exposed: The extraordinary story behind the famous multiple personality case*. New York, NY: Free Press.
- National Comorbidity Survey. (2007). *NCS-R lifetime prevalence estimates* [Data file]. Retrieved from <http://www.hcp.med.harvard.edu/ncs/index.php>
- National Institute on Drug Abuse (NIDA). (2007, October). *Comorbid drug use and mental illness: A research update from the National Institute on Drug Abuse*. Retrieved from <http://www.drugabuse.gov/sites/default/files/comorbid.pdf>
- Nestadt, G., Samuels, J., Riddle, M., Bienvenu, J., Liang, K. Y., LaBuda, M., . . . Hoehn-Saric, R. (2000). A family study of obsessive-compulsive disorder. *Archives of General Psychiatry*, *57*, 358–363.
- Newman, C. F. (2004). Suicidality. In S. L. Johnson & R. L. Leahy (Eds.), *Psychological treatment of bipolar disorder* (pp. 265–285). New York, NY: Guilford Press.
- Nikolas, M. A., & Burt, S. A. (2010). Genetic and environmental influences on ADHD symptom dimensions of inattention and hyperactivity: A meta-analysis. *Journal of Abnormal Psychology*, *119*, 1–17.
- Nolen-Hoeksema, S. (1987). Sex differences in unipolar depression: Evidence and theory. *Psychological Bulletin*, *101*, 259–282.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, *100*, 569–582.
- Nolen-Hoeksema, S. & Hilt, L. M. (2009). Gender differences in depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 386–404). New York, NY: Guilford Press.
- Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality and Social Psychology*, *77*, 1061–1072.
- Norberg, M. M., Calamari, J. E., Cohen, R. J., & Riemann, B. C. (2008). Quality of life in obsessive-compulsive disorder: An evaluation of impairment and a preliminary analysis of the ameliorating effects of treatment. *Depression and Anxiety*, *25*, 248–259.
- Novella, S. (2008, April 16). The increase in autism diagnoses: Two hypotheses [Web log post]. Retrieved from <http://www.sciencebasedmedicine.org/the-increase-in-autism-diagnoses-two-hypotheses/>
- Novick, D. M., Swartz, H. A., & Frank, E. (2010). Suicide attempts in bipolar I and bipolar II disorder: A review and meta-analysis of the evidence. *Bipolar Disorders*, *12*, 1–9.

- Noyes, R. (2001). Comorbidity in generalized anxiety disorder. *Psychiatric Clinics of North America*, 24, 41–55.
- O'Connor, R. C., Smyth, R., Ferguson, E., Ryan, C., & Williams, J. M. G. (2013). Psychological processes and repeat suicidal behavior: A four-year prospective study. *Journal of Consulting and Clinical Psychology*. Advance online publication. doi:10.1037/a0033751
- Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review*, 108, 483–552.
- Oliver, J. (2006, Summer). The myth of Thomas Szasz. *The New Atlantis*, 13. Retrieved from <http://www.thenewatlantis.com/docLib/TNA13-Oliver.pdf>
- Olsson, A., & Phelps, E. A. (2007). Social learning of fear. *Nature Neuroscience*, 10, 1095–1102.
- Oltmanns, T. F., & Castonguay, L. G. (2013). General issues in understanding and treating psychopathology. In L. G. Castonguay & T. F. Oltmanns (Eds.), *Psychopathology: From science to clinical practice* (pp. 1–16). New York, NY: Guilford Press.
- Orr, S. P., Metzger, L. J., Lasko, N. B., Macklin, M. L., Peri, T., & Pitman, R. K. (2000). De novo conditioning in trauma-exposed individuals with and without posttraumatic stress disorder. *Journal of Abnormal Psychology*, 109, 290–298.
- Owens, D., Horrocks, J., & House, A. (2002). Fatal and non-fatal repetition of self-harm: Systematic review. *British Journal of Psychiatry*, 181, 193–199.
- Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, 129, 52–73.
- Parker-Pope, T. (2013, May 2). Suicide rates rise sharply in U.S. *The New York Times*. Retrieved from <http://www.nytimes.com>.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patterson, M. L., Iizuka, Y., Tubbs, M. E., Ansel, J., Tsutsumi, M., & Anson, J. (2007). Passing encounters east and west: Comparing Japanese and American pedestrian interactions. *Journal of Nonverbal Behavior*, 31, 155–166.
- Pauls, D. L. (2010). The genetics of obsessive-compulsive disorder: A review. *Dialogues in Clinical Neuroscience*, 12, 149–163.
- Paykel, E. S. (2003). Life events and affective disorders [Supplemental material]. *Acta Psychiatrica Scandinavica*, 108(S418), 61–66.
- Pazain, M. (2010, December 2). To look or not to look? Eye contact differences in different cultures [Web log post]. Retrieved from <http://www.examiner.com/article/to-look-or-not-to-look-eye-contact-differences-different-cultures>
- Phan, K. L., Fitzgerald, D. A., Nathan, P. J., Moore, G. J., Uhde, T. W., & Tancer, M. E. (2005). Neural

- substrates for voluntary suppression of negative affect: A functional magnetic resonance imaging study. *Biological Psychiatry*, 57, 210–219.
- Phillips, D. P. (1974). The influence of suggestion on suicide: Substantive and theoretical implications of the Werther Effect. *American Sociological Review*, 39, 340–354.
- Phillips, K. (2005). *The broken mirror: Understanding and treating body dysmorphic disorder*. Oxford, England: Oxford University Press.
- Piper, A., & Merskey, H. (2004). The persistence of folly: A critical examination of dissociative identity disorder: Part I: The excesses of an improbable concept. *Canadian Journal of Psychiatry*, 49, 592–600.
- Pittman, R. K. (1988). Post-traumatic stress disorder, conditioning, and network theory. *Psychiatric Annals*, 18, 182–189.
- Pompili, M., Serafini, G., Innamorati, M., Möller-Leimkühler, A. M., Guipponi, G., Girardi, P., Tatarelli, R., & Lester, D. (2010). The hypothalamic-pituitary-adrenal axis and serotonin abnormalities: A selective overview of the implications of suicide prevention. *European Archives of Psychiatry and Clinical Neuroscience*, 260, 583–600.
- Pope, H. G., Jr., Barry, S. B., Bodkin, A., & Hudson, J. I. (2006). Tracking scientific interest in the dissociative disorders: A study of scientific publication output 1984–2003. *Psychotherapy and Psychosomatics*, 75, 19–24.
- Pope, H. G., Jr., Hudson, J. I., Bodkin, J. A., & Oliva, P. S. (1998). Questionable validity of ‘dissociative amnesia’ in trauma victims: Evidence from prospective studies. *British Journal of Psychiatry*, 172, 210–215.
- Pope, H. G., Jr., Poliakoff, M. B., Parker, M. P., Boynes, M., & Hudson, J. I. (2006). Is dissociative amnesia a culture-bound syndrome? Findings from a survey of historical literature. *Psychological Medicine*, 37, 225–233.
- Postolache, T. T., Mortensen, P. B., Tonelli, L. H., Jiao, X., Frangakis, C., Soriano, J. J., & Qin, P. (2010). Seasonal spring peaks of suicide in victims with and without prior history of hospitalization for mood disorders. *Journal of Affective Disorders*, 121, 88–93.
- Putnam, F.W., Guroff, J. J., Silberman, E. K., Barban, L., & Post, R. M. (1986). The clinical phenomenology of multiple personality disorder: A review of 100 recent cases. *Journal of Clinical Psychiatry*, 47, 285–293.
- Rachman, S. (1977). The conditioning theory of fear acquisition: A critical examination. *Behaviour Theory and Research*, 15, 375–387.
- Rieger, D. A., Kuhl, E. A., & Kupfer, D. A. (2012). DSM-5: Classification and criteria changes. *World Psychiatry*, 12, 92–98.
- Rhee, S. H., & Waldman, I. D. (2002). Genetic and environmental influences on antisocial behavior: A meta-analysis of twin and adoption studies. *Psychological Bulletin*, 128, 490–529.
- Robinson, M. S., & Alloy, L. B. (2003). Negative cognitive styles and stress-reactive rumination interact to predict depression: A prospective study. *Cognitive Therapy and Research*, 27, 275–292.
- Roche, T. (2002, March 18). Andrea Yates: More to the story. *Time*. Retrieved from <http://content.time.com/time/nation/article/0,8599,218445,00.html>.

- Root, B. A. (2000). *Understanding panic and other anxiety disorders*. Jackson, MS: University Press of Mississippi.
- Ross, C. A., Miller, S. D., Reagor, P., Bjornson, L., Fraser, G. A., & Anderson, G. (1990). Structured interview data on 102 cases of multiple personality disorder from four centers. *The American Journal of Psychiatry*, 147, 596–601.
- Rothschild, A. J. (1999). Mood disorders. In A. M. Nicholi, Jr. (Ed.), *The Harvard guide to psychiatry* (pp. 281–307). Cambridge, MA: The Belknap Press of Harvard University.
- Ruder, T. D., Hatch, G. M., Ampanozi, G., Thali, M. J., & Fischer, N. (2011). Suicide announcement on Facebook. *Crisis*, 35, 280–282.
- Ruscio, A. M., Stein, D. J., Chiu, W. T., & Kessler, R. C. (2010). The epidemiology of obsessive-compulsive disorder in the National Comorbidity Survey Replication. *Molecular Psychiatry*, 15, 53–63.
- Rushworth, M. F., Noonan, M. P., Boorman, E. D., Walton, M. E., & Behrens, T. E. (2011). Frontal cortex and reward-guided learning and decision-making. *Neuron*, 70, 1054–1069.
- Rotge, J. Y., Guehl, D., Dilharreguy, B., Cuny, E., Tignol, J., Biolac, B., . . . Aouizerate, B. (2008). Provocation of obsessive-compulsive symptoms: A quantitative voxel-based meta-analysis of functional neuroimaging studies. *Journal of Psychiatry and Neuroscience*, 33, 405–412.
- Saxena, S., Bota, R. G., & Brody, A. L. (2001). Brain-behavior relationships in obsessive-compulsive disorder. *Seminars in Clinical Neuropsychiatry*, 6, 82–101.
- Schwartz, T. (1981). *The hillside strangler: A murderer's mind*. New York, NY: New American Library.
- Seligman, M. E. P. (1971). Phobias and preparedness. *Behavioral Therapy*, 2, 307–320.
- Shih, R. A., Belmonte, P. L., & Zandi, P. P. (2004). A review of the evidence from family, twin, and adoption studies for a genetic contribution to adult psychiatric disorders. *International Review of Psychiatry*, 16, 260–283.
- Siegle, G. J., Thompson, W., Carter, C. S., Steinhauer, S. R., & Thase, M. E. (2007). Increased amygdala and decreased dorsolateral prefrontal BOLD responses in unipolar depression: Related and independent features. *Biological Psychiatry*, 61, 198–209.
- Silverstein, C. (2009). The implications of removing homosexuality from the DSM as a mental disorder. *Archives of Sexual Behavior*, 38, 161–163.
- Simon, D., Kaufmann, C., Müsch, K., Kischkel, E., & Kathmann, N. (2010). Fronto-striato-limbic hyperactivation in obsessive-compulsive disorder during individually tailored symptom provocation. *Psychophysiology*, 47(4), 728–738. doi:10.1111/j.1469-8986.2010.00980.x
- Snyder, S. H. (1976). The dopamine hypothesis of schizophrenia: Focus on the dopamine receptor. *The American Journal of Psychiatry*, 133, 197–202.
- Stack, S. (2000). Media impacts on suicide: A quantitative review of 243 findings. *Social Science Quarterly*, 81, 957–971.
- Stanley, B., Molcho, A., Stanley, M., Winchel, R., Gameroff, M. J., Parson, B., & Mann, J. J. (2000).

Association of aggressive behavior with altered serotonergic function in patients who are not suicidal. *American Journal of Psychiatry*, 157, 609–614.

Stein, M. B., & Kean, Y. M. (2000). Disability and quality of life in social phobia: Epidemiological findings. *The American Journal of Psychiatry*, 157, 1606–1613.

Steinmetz, J. E., Tracy, J. A., & Green, J. T. (2001). Classical eyeblink conditioning: Clinical models and applications. *Integrative Physiological and Behavioral Science*, 36, 220–238.

Surguladze, S., Brammer, M. J., Keedwell, P., Giampietro, V., Young, A. W., Travis, M. J., . . . Phillips, M. L. (2005). A differential pattern of neural response toward sad versus happy facial expressions in major depressive disorder. *Biological Psychiatry*, 57, 201–209.

Szasz, T. S. (1960). The myth of mental illness. *American Psychologist*, 15, 113–118.

Szasz, T. S. (2010). *The myth of mental illness: Foundations of a theory of personal conduct*. New York, NY: HarperCollins (Original work published 1961)

Szasz, T. S. (1965). Legal and moral aspects of homosexuality. In J. Marmor (Ed.), *Sexual inversion: The multiple roots of homosexuality* (pp. 124–139). New York, NY: Basic Books.

Swanson, J. M., Kinsbourne, M., Nigg, J., Lanphear, B., Stephanatos, G., Volkow, N., . . . Wadhwa, P. D. (2007). Etiologic subtypes of attention-deficit/hyperactivity disorder: Brain imaging, molecular genetic and environmental factors and the dopamine hypothesis. *Neuropsychology Review*, 17, 39–59.

Thakur, G. A., Sengupta, S. M., Grizenko, N., Schmitz, N., Pagé, V., & Joober, R. (2013). Maternal smoking during pregnancy and ADHD: A comprehensive clinical and neurocognitive characterization. *Nicotine and Tobacco Research*, 15, 149–157.

Thase, M. E. (2009). Neurobiological aspects of depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 187–217). New York, NY: Guilford Press.

The Associated Press. (2013, May 15). New psychiatric manual, DSM-5, faces criticism for turning “normal” human problems into mental illness [Web log post]. Retrieved from <http://www.nydailynews.com/life-style/health/shrinks-critics-face-new-psychiatric-manual-article-1.1344935>

Thompson, A., Molina, B. S. G., Pelham, W., & Gnagy, E. M. (2007). Risky driving in adolescents and young adults with childhood ADHD. *Journal of Pediatric Psychology*, 32, 745–759.

Thornicroft, G. (1990). Cannabis and psychosis: Is there epidemiological evidence for an association? *British Journal of Psychiatry*, 157, 25–33.

Tienari, P., Wynne, L. C., Sorri, A., Lahti, I., Lasky, K., Moring, J., . . . Wahlberg, K. (2004). Genotype-environment interaction in schizophrenia spectrum disorder. *British Journal of Psychiatry*, 184, 216–222.

Trezza V., Cuomo, V., & Vanderschuren, L. J. (2008). Cannabis and the developing brain: Insights from behavior. *European Journal of Pharmacology*, 585, 441–452.

Tsuang, M. T., Farone, S. V., & Green, A. I. (1999). Schizophrenia and other psychotic disorders. In A. M. Nicholi, Jr. (Ed.), *The Harvard guide to psychiatry* (pp. 240–280). Cambridge, MA: The Belknap Press of Harvard University Press.

- van Praag, H. M. (2005). Can stress cause depression? [Supplemental material]. *The World Journal of Biological Psychiatry*, 6(S2), 5–22.
- Victor, T. A., Furey, M. L., Fromm, S. J., Öhman, A., & Drevets, W. C. (2010). Relationship between amygdala responses to masked faces and mood state and treatment in major depressive disorder. *Archives of General Psychiatry*, 67, 1128–1138.
- Volkow N. D., Fowler J. S., Logan J., Alexoff D., Zhu W., Telang F., . . . Apelskog-Torres K. (2009). Effects of modafinil on dopamine and dopamine transporters in the male human brain: clinical implications. *Journal of the American Medical Association*, 301, 1148–1154.
- Wakefield, J. C. (1992). The concept of mental disorder: On the boundary between biological facts and social values. *American Psychologist*, 47, 373–388.
- Waller, J. (2009a). Looking back: Dancing plagues and mass hysteria. *The Psychologist*, 22(7), 644–647.
- Waller, J. (2009b, February 21). A forgotten plague: Making sense of dancing mania. *The Lancet*, 373(9664), 624– 625. doi:10.1016/S0140-6736(09)60386-X
- Weiser, E. B. (2007). The prevalence of anxiety disorders among adults with Asthma: A meta-analytic review. *Journal of Clinical Psychology in Medical Settings*, 14, 297–307.
- White, C. N., Gunderson, J. G., Zanarani, M. C., & Hudson, J. I. (2003). Family studies of borderline personality disorder: A review. *Harvard Review of Psychiatry*, 11, 8–19.
- Whooley, M. A. (2006). Depression and cardiovascular disease: Healing the broken-hearted. *Journal of the American Medical Association*, 295, 2874–2881.
- Wilcox, H. C., Conner, K. R., & Caine, E. D. (2004). Association of alcohol and drug use disorders and completed suicide: An empirical review of cohort studies [Supplemental material]. *Drug and Alcohol Dependence*, 76, S11–S19.
- Wing, L., Gould, J., & Gillberg, C. (2011). Autism spectrum disorders in the DSM-V: Better or worse than the DSM IV? *Research in Developmental Disabilities*, 32, 768–773.
- Wisner, K. L., Sit, D. K. Y., McShea, M. C., Rizzo, D. M., Zoretich, R. A., Hughes, C. L., Hanusa, B. H. (2013). Onset timing, thoughts of self-harm, and diagnoses in postpartum women with screen-positive depression findings. *JAMA Psychiatry*, 70, 490–498.
- Wolraich, M. L., Wilson, D. B., & White, J. W. (1995). The effect of sugar on behavior or cognition in children. *Journal of the American Medical Association*, 274, 1617–1621.
- World Health Organization (WHO). (2013). *International classification of diseases (ICD)*. Retrieved from <http://www.who.int/classifications/icd/en/>
- Wyatt, W. J., & Midkiff, D. M. (2006). Biological psychiatry: A practice in search of a science. *Behavior and Social Issues*, 15, 132–151.
- Xie, P., Kranzler, H. R., Poling, J., Stein, M. B., Anton, R. F., Brady, K., Gelernter, J. (2009). Interactive effect of stressful life events and the serotonin transporter 5-HTTLPR genotype on posttraumatic stress disorder diagnosis in 2 independent populations. *Archives of General Psychology*, 66, 1201–1209.

- Zachar, P., & Kendler, K. S. (2007). Psychiatric disorders: A conceptual taxonomy. *The American Journal of Psychiatry*, 16, 557–565.
- Zuckerman, M. (1999). *Vulnerability to psychopathology: A biosocial model*. Washington, DC: American Psychological Association.

PART XIV

TREATMENT OF PSYCHOLOGICAL DISORDERS

THERAPY ON FOUR LEGS

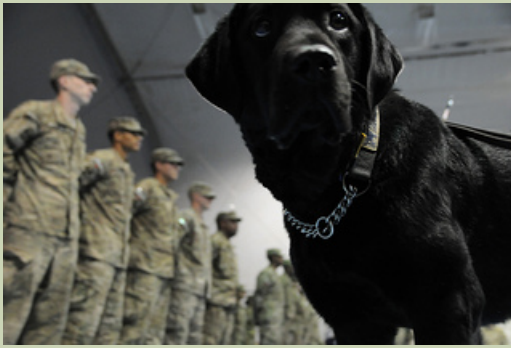
Lucien Masson, a 60-year-old Vietnam veteran from Arizona, put it simply: “Sascha is the best medicine I’ve ever had.”

Lucien is speaking about his friend, companion, and perhaps even his therapist, a Russian wolfhound named Sascha. Lucien suffers from posttraumatic stress disorder (PTSD), a disorder that has had a profoundly negative impact on his life for many years. His symptoms include panic attacks, nightmares, and road rage. Lucien has tried many solutions, consulting with doctors, psychiatrists, and psychologists, and using a combination of drugs, group therapy, and anger-management classes.

But Sascha seems to be the best therapist of all. He helps out in many ways. If a stranger gets too close to Lucien in public, Sascha will block the stranger with his body. Sascha is trained to sense when Lucien is about to have a nightmare, waking him before it starts. Before road rage can set in, Sascha gently whimpers, reminding his owner that it doesn’t pay to get upset about nutty drivers.

In the same way, former Army medic Jo Hanna Schaffer speaks of her Chihuahua, Cody: “I never took a pill for PTSD that did as much for me as Cody has done.” Persian Gulf War veteran Karen Alexander feels the same way about her Bernese mountain dog, Cindy:

She’ll come up and touch me, and that is enough of a stimulus to break the loop, bring me back to reality. Sometimes I’ll scratch my hand until it’s raw and won’t realize until she comes up to me and brings me out. She’s such a grounding influence for me.



Can
psychiatric
therapy dogs
help people
who suffer
from PTSD?
The U.S.
Army –
Therapy dog
– CC BY 2.0.

These dramatic stories of improvement from debilitating disorders can be attributed to an alternative psychological therapy, based on established behavioral principles, provided by “psychiatric service dogs.” The dogs are trained to help people with a variety of mental disorders, including panic attacks, anxiety disorder, obsessive-compulsive disorder, and bipolar disorder. They help veterans of Iraq and Afghanistan cope with their traumatic brain injuries as well as with PTSD.

The dogs are trained to perform specific behaviors that are helpful to their owners. If the dog’s owner is depressed, the dog will snuggle up and offer physical comfort; if the owner is having a panic attack, the owner can calm himself by massaging the dog’s body. The serenity shown by the dogs in all situations seems to reassure the PTSD sufferer that all must be well. Service dogs are constant, loving companions who provide emotional support and companionship to their embattled, often isolated owners (Shim, 2008; Lorber, 2010; Alaimo, 2010; Schwartz, 2008).

Despite the reports of success from many users, it is important to keep in mind that the utility of psychiatric service dogs has not yet been tested, and thus would never be offered as a therapy by a trained clinician or paid for by an insurance company. Although interaction between humans and dogs can create positive physiological responses (Odendaal, 2000), whether the dogs actually help people recover from PTSD is not yet known.

Psychological disorders create a tremendous individual, social, and economic drain on society. Disorders make it difficult for people to engage in productive lives and effectively contribute to their family and to society. Disorders lead to disability and absenteeism in the workplace, as well as physical problems, premature death, and suicide. At a societal level the costs are staggering. It has been estimated that the annual financial burden of each case of anxiety disorder is over \$3,000 per year, meaning that the annual cost of anxiety disorders alone in the United States runs into the trillions of dollars (Konnopka, Leichenring, Leibing, & König, 2009; Smit et al., 2006).

The goal of this chapter is to review the techniques that are used to treat psychological disorder. Just as psychologists consider the causes of disorder in terms of the bio-psycho-social model of illness, treatment is also based on psychological, biological, and social approaches.

- The *psychological approach* to reducing disorder involves providing help to individuals or families through psychological therapy, including psychoanalysis, humanistic-oriented therapy, cognitive-behavioral therapy (CBT), and other approaches.

- The *biomedical approach to reducing disorder* is based on the use of medications to treat mental disorders such as schizophrenia, depression, and anxiety, as well as the employment of brain intervention techniques, including *electroconvulsive therapy (ECT)*, *transcranial magnetic stimulation (TMS)*, and *psychosurgery*.
- The *social approach to reducing disorder* focuses on changing the social environment in which individuals live to reduce the underlying causes of disorder. These approaches include *group, couples, and family therapy*, as well as *community outreach programs*. The community approach is likely to be the most effective of the three approaches because it focuses not only on treatment, but also on prevention of disorders (World Health Organization, 2004)¹.

A clinician may focus on any or all of the three approaches to treatment, but in making a decision about which to use, he or she will always rely on his or her knowledge about existing empirical tests of the effectiveness of different treatments. These tests, known as *outcome studies*, carefully compare people who receive a given treatment with people who do not receive a treatment, or with people who receive a different type of treatment. Taken together, these studies have confirmed that many types of therapies are effective in treating disorder.

¹World Health Organization. (2004). *Prevention of mental disorders: Effective interventions and policy options: Summary report*. Retrieved from http://www.who.int/mental_health/evidence/en/Prevention_of_Mental_Disorders.pdf

81.

REDUCING DISORDER BY CONFRONTING IT: PSYCHOTHERAPY

Learning Objectives

- Outline and differentiate the psychodynamic, humanistic, behavioral, and cognitive approaches to psychotherapy.
- Explain the behavioral and cognitive aspects of cognitive-behavioral therapy and how CBT is used to reduce psychological disorders.

Treatment for a psychological disorder begins when the individual who is experiencing distress visits a counselor or therapist, perhaps in a church, a community center, a hospital, or a private practice. The therapist will begin by systematically learning about the patient's needs through requesting a formal **psychological assessment**, which is *an evaluation of the patient's psychological and mental health*. During the assessment, administered by a licensed psychologist, the evaluator may give personality tests such as the Minnesota Multiphasic Personal Inventory (MMPI-2) or projective tests, and will conduct a thorough interview with the patient. The psychologist may get more information from family members or school personnel, which can then be given to the therapist in an official diagnostic report.

In addition to the psychological assessment, the patient is usually seen by a physician to gain information about potential (physical) problems. In some cases of psychological disorder—and particularly for sexual problems—medical treatment is the preferred course of action. For instance, men who are experiencing erectile dysfunction disorder may need surgery to increase blood flow or local injections of muscle relaxants. Or they may be prescribed medications (Viagra, Cialis, or Levitra) that provide an increased blood supply to the penis, which are successful in increasing performance in about 70% of men who take them.

DSM-5-TM CRITERIA FOR DIAGNOSING ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD)

To be diagnosed with ADHD the individual must display either A or B below (American Psychiatric Association, 2013)¹: (The symptoms below to entail all the criteria needed for diagnosis).

A. Six or more of the following symptoms of inattention have been present for at least 6 months to a point that is disruptive and inappropriate for developmental level:

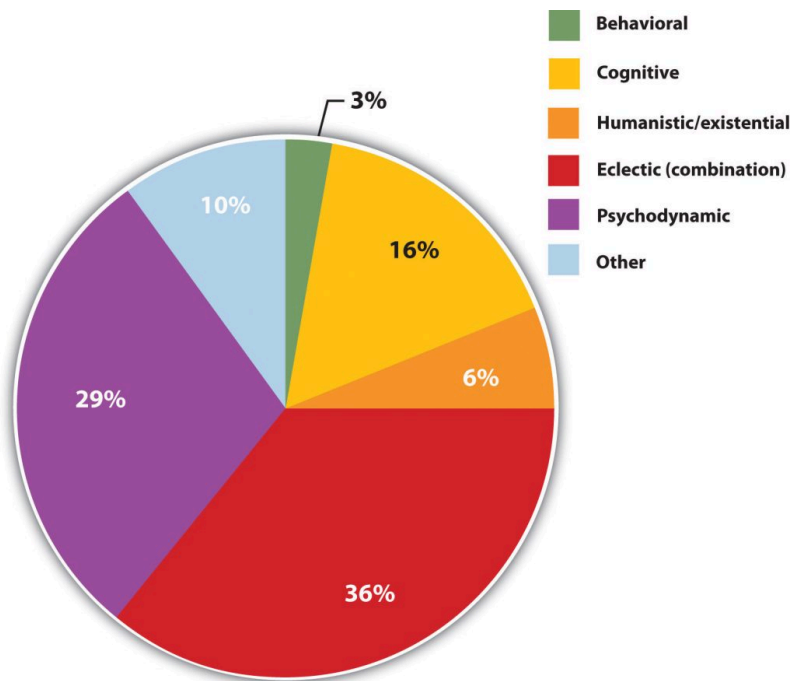
- Often does not give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- Often has trouble keeping attention on tasks or play activities
- Often does not seem to listen when spoken to directly
- Often does not follow instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
- Often has trouble organizing activities
- Often avoids, dislikes, or doesn't want to do things that take a lot of mental effort for a long period of time (such as schoolwork or homework)
- Often loses things needed for tasks and activities (e.g., toys, school assignments, pencils, books, or tools)
- Is often easily distracted
- Is often forgetful in daily activities

B. Six or more of the following symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for developmental level:

- Often fidgets with hands or feet or squirms in seat
- Often gets up from seat when remaining in seat is expected
- Often runs about or climbs when and where it is not appropriate (adolescents or adults may feel very restless)
- Often has trouble playing or enjoying leisure activities quietly
- Is often "on the go" or often acts as if "driven by a motor"
- Often talks excessively
- Often blurts out answers before questions have been finished
- Often has trouble waiting one's turn
- Often interrupts or intrudes on others (e.g., butts into conversations or games)

If a diagnosis is made, the therapist will select a course of therapy that he or she feels will be most effective. One approach to treatment is **psychotherapy**, *the professional treatment for psychological disorder through techniques designed to encourage communication of conflicts and insight*. The fundamental aspect of psychotherapy is that the patient directly confronts the disorder and works with the therapist to help reduce it. Therapy includes assessing the patient's issues and problems, planning a course of treatment, setting goals for change, the treatment itself, and an evaluation of the patient's progress. Therapy is practiced by thousands of psychologists and other trained practitioners in the United States and around the world, and is responsible for billions of dollars of the health budget.

To many people therapy involves a patient lying on a couch with a therapist sitting behind and nodding sagely as the patient speaks. Though this approach to therapy (known as *psychoanalysis*) is still practiced, it is in the minority. It is estimated that there are over 400 different kinds of therapy practiced by people in many fields, and the most important of these are shown in [Figure 13.2 “The Many Types of Therapy Practiced in the United States”](#). The therapists who provide these treatments include psychiatrists (who have a medical degree and can prescribe drugs) and clinical psychologists, as well as social workers, psychiatric nurses, and couples, marriage, and family therapists.



These data show the proportion of psychotherapists who reported practicing each type of therapy. Adapted from Norcross, J. C., Hedges, M., & Castle, P. H. (2002). Psychologists conducting psychotherapy in 2001: A study of the Division 29 membership. *Psychotherapy: Theory, Research, Practice, Training*, 39(1), 97-102.

DIFFICULTIES

Many people who would benefit from psychotherapy do not get it, either because they do not know how to find it or because they feel that they will be stigmatized and embarrassed if they seek help. The decision to not seek help is a very poor choice because the effectiveness of mental health treatments is well documented and, no matter where a person lives, there are treatments available (U.S. Department of Health and Human Services, 1999)².

The first step in seeking help for psychological problems is to accept the stigma. It is possible that some of your colleagues, friends, and family members will know that you are seeking help and some may at first think more negatively of you for it. But you must get past these unfair and close-minded responses. Feeling good about yourself is the most important thing you can do, and seeking help may be the first step in doing so.

One question is how to determine if someone needs help. This question is not always easy to answer because there is no clear demarcation between “normal” and “abnormal” behavior. Most generally, you will know that you or others need help when the person’s psychological state is negatively influencing his or her everyday behavior, when the behavior is adversely affecting those around the person, and when the problems continue over a period of time. Often people seek therapy as a result of a life-changing event such as diagnosis of a fatal illness, an upcoming marriage or divorce, or the death of a loved one. But therapy is also effective for general depression and anxiety, as well as for specific everyday problems.

There are a wide variety of therapy choices, many of which are free. Begin in your school, community, or church, asking about community health or counseling centers and pastoral counseling. You may want to *ask friends and family members for recommendations*. You’ll probably be surprised at how many people have been to counseling, and how many recommend it.

There are many therapists who offer a variety of treatment options. Be sure to ask about the degrees that the therapist has earned, and about the reputation of the center in which the therapy occurs. If you have choices, try to find a person or location that you like, respect, and trust. This will allow you to be more open, and you will get more out of the experience. Your sessions with the help provider will require discussing your family history, personality, and relationships, and you should feel comfortable sharing this information.

Remember also that confronting issues requires time to reflect, energy to get to the appointments and deal with consequential feelings, and discipline to explore your issues on your own. Success at therapy is difficult, and it takes effort.

The bottom line is that going for therapy should not be a difficult decision for you. All people have

the right to appropriate mental health care just as they have a right to general health care. Just as you go to a dentist for a toothache, you may go to therapy for psychological difficulties. Furthermore, you can be confident that you will be treated with respect and that your privacy will be protected, because therapists follow ethical principles in their practices. The following provides a summary of these principles as developed by the American Psychological Association (2010)³.

- Psychologists inform their clients/patients as early as possible in the therapeutic relationship about the nature and anticipated course of therapy, fees, involvement of third parties, and limits of confidentiality, and provide sufficient opportunity for the client/patient to ask questions and receive answers.
- Psychologists inform their clients/patients of the developing nature of the treatment, the potential risks involved, alternative treatments that may be available, and about the voluntary nature of their participation.
- When the therapist is a trainee, the client/patient is informed that the therapist is in training and is being supervised, and is given the name of the supervisor.
- When psychologists agree to provide services to several persons who have a relationship (such as spouses, significant others, or parents and children), they take reasonable steps to clarify at the outset which of the individuals are clients/patients and the relationship the psychologist will have with each person.
- If it becomes apparent that a psychologist may be called on to perform potentially conflicting roles (such as family therapist and then witness for one party in divorce proceedings), the psychologist takes reasonable steps to clarify and modify, or withdraw from, roles appropriately.
- When psychologists provide services to several persons in a group setting, they describe at the outset the roles and responsibilities of all parties and the limits of confidentiality.
- Psychologists do not engage in sexual intimacies with current therapy clients/patients, or with individuals they know to be close relatives, guardians, or significant others of current clients/patients. Psychologists do not terminate therapy to circumvent this standard. Psychologists do not accept as therapy clients/patients persons with whom they have engaged in sexual intimacies, nor do they have sexual intimacies with former clients/patients for at least 2 years after cessation or termination of therapy.
- Psychologists terminate therapy when it becomes reasonably clear that the client/patient no longer needs the service, is not likely to benefit, or is being harmed by continued service.

PSYCHODYNAMIC THERAPY

Psychodynamic therapy (psychoanalysis) is a psychological treatment based on Freudian and neo-Freudian personality theories in which the therapist helps the patient explore the unconscious dynamics of personality. The analyst engages with the patient, usually in one-on-one sessions, often with the patient lying on a couch and facing away. The goal of the psychotherapy is for the patient to talk about his or her personal concerns and anxieties, *allowing the therapist to try to understand the underlying unconscious problems that are causing the symptoms* (the process of **interpretation**). The analyst may try out some interpretations on the patient and observe how he or she responds to them.

The patient may be asked to verbalize his or her thoughts through **free association**, in which the *therapist listens while the client talks about whatever comes to mind, without any censorship or filtering*. The client may also be asked to report on his or her dreams, and the therapist will use **dream analysis** to *analyze the symbolism of the dreams in an effort to probe the unconscious thoughts of the client and interpret their significance*. On the basis of the thoughts expressed by the patient, the analyst discovers the unconscious conflicts causing the patient's symptoms and interprets them for the patient.

The goal of psychotherapy is to help the patient develop **insight**—that is, *an understanding of the unconscious causes of the disorder* (Epstein, Stern, & Silbersweig, 2001; Lubarsky & Barrett, 2006), but the patient often shows **resistance** to these new understandings, *using defense mechanisms to avoid the painful feelings in his or her unconscious*. The patient might forget or miss appointments, or act out with hostile feelings toward the therapist. The therapist attempts to help the patient develop insight into the causes of the resistance. The sessions may also lead to **transference**, in which *the patient unconsciously redirects feelings experienced in an important personal relationship toward the therapist*. For instance, the patient may transfer feelings of guilt that come from the father or mother to the therapist. Some therapists believe that transference should be encouraged, as it allows the client to resolve hidden conflicts and work through feelings that are present in the relationships.

IMPORTANT CHARACTERISTICS AND EXPERIENCES IN PSYCHOANALYSIS

- **Free association.** The therapist listens while the client talks about whatever comes to mind, without any censorship or filtering. The therapist then tries to interpret these free associations, looking for unconscious causes of symptoms.
- **Dream analysis.** The therapist listens while the client describes his or her dreams and then analyzes the symbolism of the dreams in an effort to probe the unconscious thoughts of the client and interpret their significance.

- **Insight.** An understanding by the patient of the unconscious causes of his or her symptoms.
- **Interpretation.** The therapist uses the patient's expressed thoughts to try to understand the underlying unconscious problems. The analyst may try out some interpretations on the patient and observe how he or she responds to them.
- **Resistance.** The patient's use of defense mechanisms to avoid the painful feelings in his or her unconscious. The patient might forget or miss appointments, or act out with hostile feelings toward the therapist. The therapist attempts to help the patient develop insight into the causes of the resistance.
- **Transference.** The unconscious redirection of the feelings experienced in an important personal relationship toward the therapist. For instance, the patient may transfer feelings of guilt that come from the father or mother to the therapist.

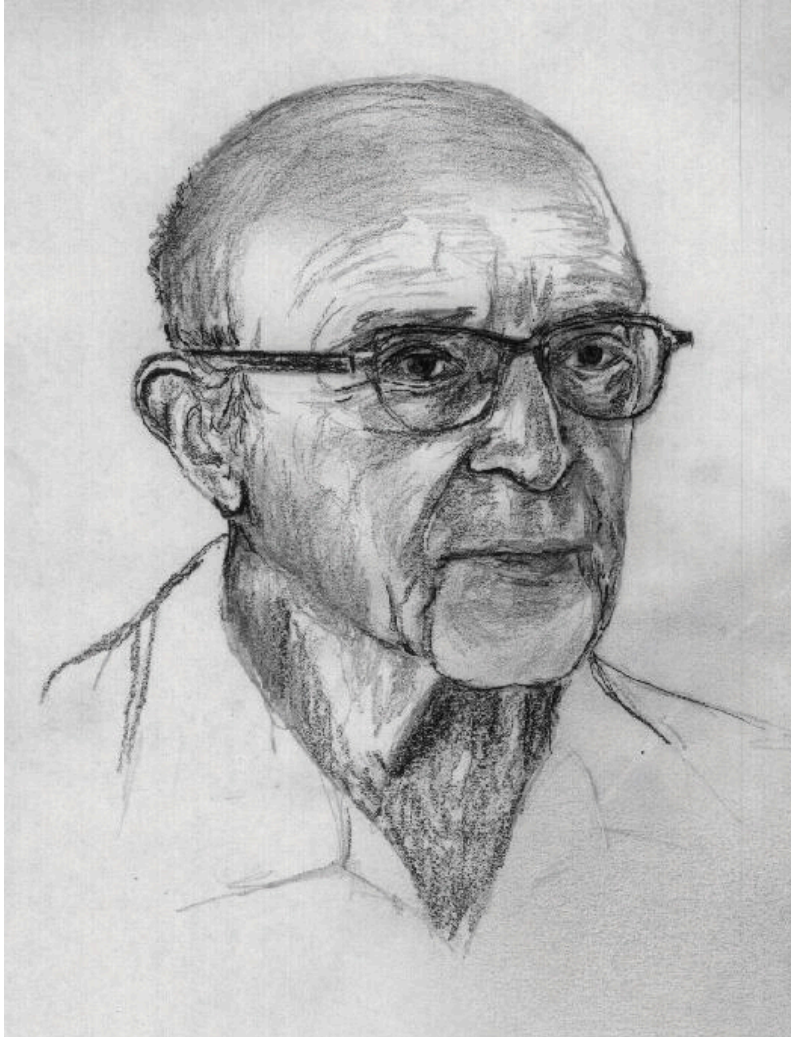
One problem with traditional psychoanalysis is that the sessions may take place several times a week, go on for many years, and cost thousands of dollars. To help more people benefit, modern psychodynamic approaches frequently use shorter-term, focused, and goal-oriented approaches. In these “brief psychodynamic therapies,” the therapist helps the client determine the important issues to be discussed at the beginning of treatment and usually takes a more active role than in classic psychoanalysis (Levenson, 2010).

HUMANISTIC THERAPIES

Just as psychoanalysis is based on the personality theories of Freud and the neo-Freudians, **humanistic therapy** is a psychological treatment based on the personality theories of Carl Rogers and other humanistic psychologists. Humanistic therapy is based on the idea that people develop psychological problems when they are burdened by limits and expectations placed on them by themselves and others, and the treatment emphasizes the person's capacity for self-realization and fulfillment. Humanistic therapies attempt to promote growth and responsibility by helping clients consider their own situations and the world around them and how they can work to achieve their life goals.

Carl Rogers developed **person-centered therapy (or client-centered therapy)**, an approach to treatment in which the client is helped to grow and develop as the therapist provides a comfortable, nonjudgmental environment. In his book, *A Way of Being* (1980), Rogers argued that therapy was most productive when the

therapist created a positive relationship with the client—a *therapeutic alliance*. The **therapeutic alliance** is a relationship between the client and the therapist that is facilitated when the therapist is genuine (i.e., he or she creates no barriers to free-flowing thoughts and feelings), when the therapist treats the client with unconditional positive regard (i.e., values the client without any qualifications, displaying an accepting attitude toward whatever the client is feeling at the moment), and when the therapist develops empathy with the client (i.e., that he or she actively listens to and accurately perceives the personal feelings that the client experiences).



Carl Rogers was among the founders of the humanistic approach to therapy and developed the fundamentals of person-centered therapy.
Didius – Carl Ransom Rogers – CC BY 2.5.

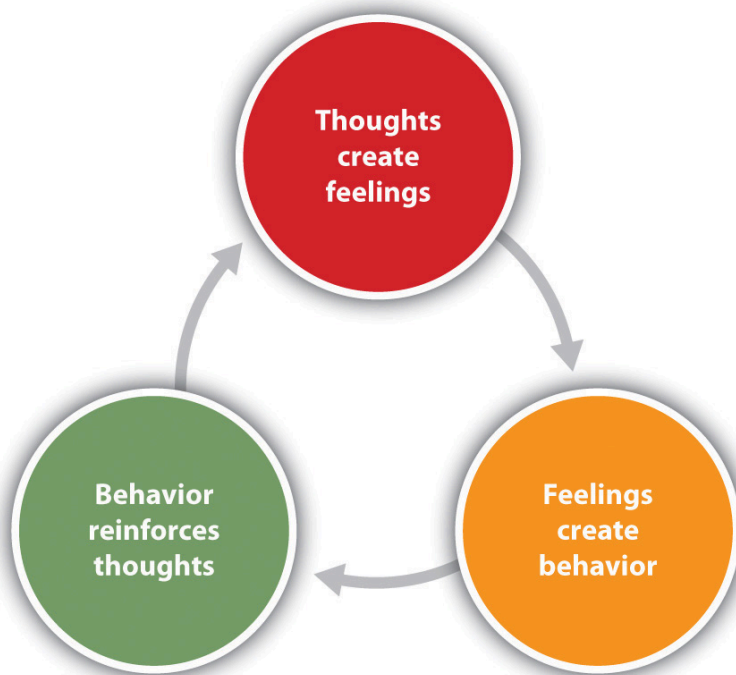
The development of a positive therapeutic alliance has been found to be exceedingly important to successful therapy. The ideas of genuineness, empathy, and unconditional positive regard in a nurturing relationship in which the therapist actively listens to and reflects the feelings of the client is probably the most fundamental part of contemporary psychotherapy (Prochaska & Norcross, 2007).

Psychodynamic and humanistic therapies are recommended primarily for people suffering from generalized anxiety or mood disorders, and who desire to feel better about themselves overall. But the goals of people with

other psychological disorders, such as phobias, sexual problems, and obsessive-compulsive disorder (OCD), are more specific. A person with a social phobia may want to be able to leave his or her house, a person with a sexual dysfunction may want to improve his or her sex life, and a person with OCD may want to learn to stop letting his obsessions or compulsions interfere with everyday activities. In these cases it is not necessary to revisit childhood experiences or consider our capacities for self-realization—we simply want to deal with what is happening in the present.

Cognitive-behavior therapy (CBT) is a structured approach to treatment that attempts to reduce psychological disorders through systematic procedures based on cognitive and behavioral principles. As you can see in the figure “Cognitive-Behavior Therapy”, CBT is based on the idea that there is a recursive link among our thoughts, our feelings, and our behavior. For instance, if we are feeling depressed, our negative thoughts (“I am doing poorly in my chemistry class”) lead to negative feelings (“I feel hopeless and sad”), which then contribute to negative behaviors (lethargy, disinterest, lack of studying). When we or other people look at the negative behavior, the negative thoughts are reinforced and the cycle repeats itself (Beck, 1976). Similarly, in panic disorder a patient may misinterpret his or her feelings of anxiety as a sign of an impending physical or mental catastrophe (such as a heart attack), leading to avoidance of a particular place or social situation. The fact that the patient is avoiding the situation reinforces the negative thoughts. Again, the thoughts, feelings, and behavior amplify and distort each other.

Cognitive-Behavior Therapy



Cognitive-behavior therapy (CBT) is based on the idea that our thoughts, feelings, and behavior reinforce each other and that changing our thoughts or behavior can make us feel better.

CBT is a very broad approach that is used for the treatment of a variety of problems, including mood, anxiety,

personality, eating, substance abuse, attention-deficit, and psychotic disorders. CBT treats the symptoms of the disorder (the behaviors or the cognitions) and does not attempt to address the underlying issues that cause the problem. The goal is simply to stop the negative cycle by intervening to change cognition or behavior. The client and the therapist work together to develop the goals of the therapy, the particular ways that the goals will be reached, and the timeline for reaching them. The procedures are problem-solving and action-oriented, and the client is forced to take responsibility for his or her own treatment. The client is assigned tasks to complete that will help improve the disorder and takes an active part in the therapy. The treatment usually lasts between 10 and 20 sessions.

Depending on the particular disorder, some CBT treatments may be primarily behavioral in orientation, focusing on the principles of classical, operant, and observational learning, whereas other treatments are more cognitive, focused on changing negative thoughts related to the disorder. But almost all CBT treatments use a combination of behavioral and cognitive approaches.

BEHAVIORAL ASPECTS OF CBT

In some cases the primary changes that need to be made are behavioral. **Behavioral therapy** is *psychological treatment that is based on principles of learning*. The most direct approach is through operant conditioning using reward or punishment. Reinforcement may be used to teach new skills to people, for instance, those with autism or schizophrenia (Granholm et al., 2008; Herbert et al., 2005; Scattone, 2007). If the patient has trouble dressing or grooming, then reinforcement techniques, such as providing tokens that can be exchanged for snacks, are used to reinforce appropriate behaviors such as putting on one's clothes in the morning or taking a shower at night. If the patient has trouble interacting with others, reinforcement will be used to teach the client how to more appropriately respond in public, for instance, by maintaining eye contact, smiling when appropriate, and modulating tone of voice.

As the patient practices the different techniques, the appropriate behaviors are shaped through reinforcement to allow the client to manage more complex social situations. In some cases observational learning may also be used; the client may be asked to observe the behavior of others who are more socially skilled to acquire appropriate behaviors. People who learn to improve their interpersonal skills through skills training may be more accepted by others and this social support may have substantial positive effects on their emotions.

When the disorder is anxiety or phobia, then the goal of the CBT is to reduce the negative affective responses to the feared stimulus. **Exposure therapy** is *a behavioral therapy based on the classical conditioning principle of extinction, in which people are confronted with a feared stimulus with the goal of decreasing their*

negative emotional responses to it (Wolpe, 1973). Exposure treatment can be carried out in real situations or through imagination, and it is used in the treatment of panic disorder, agoraphobia, social phobia, OCD, and posttraumatic stress disorder (PTSD).

In *flooding*, a client is exposed to the source of his fear all at once. An agoraphobic might be taken to a crowded shopping mall or someone with an extreme fear of heights to the top of a tall building. The assumption is that the fear will subside as the client habituates to the situation while receiving emotional support from the therapist during the stressful experience. An advantage of the flooding technique is that it is quick and often effective, but a disadvantage is that the patient may **relapse** (*repeated drug use and/or alcohol use after a period of improvement from substance abuse*) after a short period of time.

More frequently, the exposure is done more gradually. **Systematic desensitization** is a *behavioral treatment that combines imagining or experiencing the feared object or situation with relaxation exercises* (Wolpe, 1973). The client and the therapist work together to prepare a *hierarchy of fears*, starting with the least frightening, and moving to the most frightening scenario surrounding the object (Table “Hierarchy of Fears Used in Systematic Desensitization”). The patient then confronts her fears in a systematic manner, sometimes using her imagination but usually, when possible, in real life.

Hierarchy of Fears Used in Systematic Desensitization

Behavior	Fear rating
Think about a spider.	10
Look at a photo of a spider.	25
Look at a real spider in a closed box.	50
Hold the box with the spider.	60
Let a spider crawl on your desk.	70
Let a spider crawl on your shoe.	80
Let a spider crawl on your pants leg.	90
Let a spider crawl on your sleeve.	95
Let a spider crawl on your bare arm.	100

Desensitization techniques use the principle of *counterconditioning*, in which a second incompatible response (relaxation, e.g., through deep breathing) is conditioned to an already conditioned response (the fear response). The continued pairing of the relaxation responses with the feared stimulus as the patient works up the hierarchy gradually leads the fear response to be extinguished and the relaxation response to take its place.

Behavioral therapy works best when people directly experience the feared object. Fears of spiders are more directly habituated when the patient interacts with a real spider, and fears of flying are best extinguished when the patient gets on a real plane. But it is often difficult and expensive to create these experiences for the patient. Recent advances in virtual reality have allowed clinicians to provide CBT in what seem like real situations to the patient. In *virtual reality CBT*, the therapist uses computer-generated, three-dimensional, lifelike images of the feared stimulus in a systematic desensitization program. Specially designed computer equipment, often with a head-mount display, is used to create a simulated environment. A common use is in helping soldiers who are experiencing PTSD return to the scene of the trauma and learn how to cope with the stress it invokes.

Some of the advantages of the virtual reality treatment approach are that it is economical, the treatment session can be held in the therapist's office with no loss of time or confidentiality, the session can easily be terminated as soon as a patient feels uncomfortable, and many patients who have resisted live exposure to the object of their fears are willing to try the new virtual reality option first.

Aversion therapy is a type of behavior therapy in which positive punishment is used to reduce the frequency of an undesirable behavior. An unpleasant stimulus is intentionally paired with a harmful or socially unacceptable behavior until the behavior becomes associated with unpleasant sensations and is hopefully reduced. A child who wets his bed may be required to sleep on a pad that sounds an alarm when it senses moisture. Over time, the positive punishment produced by the alarm reduces the bedwetting behavior (Houts, Berman, & Abramson, 1994). Aversion therapy is also used to stop other specific behaviors such as nail biting (Allen, 1996).

Alcoholism has long been treated with aversion therapy (Baker & Cannon, 1988). In a standard approach, patients are treated at a hospital where they are administered a drug, *antabuse*, that makes them nauseous if they consume any alcohol. The technique works very well if the user keeps taking the drug (Krampe et al., 2006), but unless it is combined with other approaches the patients are likely to relapse after they stop the drug.

COGNITIVE ASPECTS OF CBT

While behavioral approaches focus on the actions of the patient, **cognitive therapy** is a psychological treatment that helps clients identify incorrect or distorted beliefs that are contributing to disorder. In cognitive therapy the therapist helps the patient develop new, healthier ways of thinking about themselves and about the others around them. The idea of cognitive therapy is that changing thoughts will change emotions, and that the new emotions will then influence behavior (see Figure “Cognitive-Behavior Therapy”).

The goal of cognitive therapy is not necessarily to get people to think more positively but rather to think more accurately. For instance, a person who thinks “no one cares about me” is likely to feel rejected, isolated,

and lonely. If the therapist can remind the person that she has a mother or daughter who does care about her, more positive feelings will likely follow. Similarly, changing beliefs from “I have to be perfect” to “No one is always perfect—I’m doing pretty good,” from “I am a terrible student” to “I am doing well in some of my courses,” or from “She did that on purpose to hurt me” to “Maybe she didn’t realize how important it was to me” may all be helpful.

The psychiatrist Aaron T. Beck and the psychologist Albert Ellis (1913–2007) together provided the basic principles of cognitive therapy. Ellis (2004) called his approach *rational emotive behavior therapy (REBT)* or *rational emotive therapy (RET)*, and he focused on pointing out the flaws in the patient’s thinking. Ellis noticed that people experiencing strong negative emotions tend to personalize and overgeneralize their beliefs, leading to an inability to see situations accurately (Leahy, 2003). In REBT, the therapist’s goal is to challenge these irrational thought patterns, helping the patient replace the irrational thoughts with more rational ones, leading to the development of more appropriate emotional reactions and behaviors.

Beck’s (Beck, 1995; Beck, Freeman, & Davis, 2004) cognitive therapy was based on his observation that people who were depressed generally had a large number of highly accessible negative thoughts that influenced their thinking. His goal was to develop a short-term therapy for depression that would modify these unproductive thoughts. Beck’s approach challenges the client to test his beliefs against concrete evidence. If a client claims that “everybody at work is out to get me,” the therapist might ask him to provide instances to corroborate the claim. At the same time the therapist might point out contrary evidence, such as the fact that a certain coworker is actually a loyal friend or that the patient’s boss had recently praised him.

COMBINATION (ECLECTIC) APPROACHES TO THERAPY

To this point we have considered the different approaches to psychotherapy under the assumption that a therapist will use only one approach with a given patient. But this is not the case; as you saw in the figure “The Many Types of Therapy Practiced in the United States”, the most commonly practiced approach to therapy is an **eclectic therapy**, *an approach to treatment in which the therapist uses whichever techniques seem most useful and relevant for a given patient*. For bipolar disorder, for instance, the therapist may use both psychological skills training to help the patient cope with the severe highs and lows, but may also suggest that the patient consider biomedical drug therapies (Newman, Leahy, Beck, Reilly-Harrington, & Gyulai, 2002). Treatment for major depressive disorder usually involves antidepressant drugs as well as CBT to help the patient deal with particular problems (McBride, Farvolden, & Swallow, 2007).

One of the most commonly diagnosed disorders is borderline personality disorder (BPD). Consider this description, typical of the type of borderline patient who arrives at a therapist's office:

Even as an infant, it seemed that there was something different about Bethany. She was an intense baby, easily upset and difficult to comfort. She had very severe separation anxiety—if her mother left the room, Bethany would scream until she returned. In her early teens, Bethany became increasingly sullen and angry. She started acting out more and more—yelling at her parents and teachers and engaging in impulsive behavior such as promiscuity and running away from home. At times Bethany would have a close friend at school, but some conflict always developed and the friendship would end.

By the time Bethany turned 17, her mood changes were totally unpredictable. She was fighting with her parents almost daily, and the fights often included violent behavior on Bethany's part. At times she seemed terrified to be without her mother, but at other times she would leave the house in a fit of rage and not return for a few days. One day, Bethany's mother noticed scars on Bethany's arms. When confronted about them, Bethany said that one night she just got more and more lonely and nervous about a recent breakup until she finally stuck a lit cigarette into her arm. She said "I didn't really care for him that much, but I had to do something dramatic." When she was 18 Bethany rented a motel room where she took an overdose of sleeping pills. Her suicide attempt was not successful, but the authorities required that she seek psychological help.

Most therapists will deal with a case such as Bethany's using an eclectic approach. First, because her negative mood states are so severe, they will likely recommend that she start taking antidepressant medications. These drugs are likely to help her feel better and will reduce the possibility of another suicide attempt, but they will not change the underlying psychological problems. Therefore, the therapist will also provide psychotherapy.

The first sessions of the therapy will likely be based primarily on creating trust. Person-centered approaches will be used in which the therapist attempts to create a therapeutic alliance conducive to a frank and open exchange of information.

If the therapist is trained in a psychodynamic approach, he or she will probably begin intensive face-to-face psychotherapy sessions at least three times a week. The therapist may focus on childhood experiences related to Bethany's attachment difficulties but will also focus in large part on the causes of the present behavior. The therapist will understand that because Bethany does not have good relationships with other people, she will likely seek a close bond with the therapist, but the therapist will probably not allow the transference relationship to develop fully. The therapist will also realize that Bethany will probably try to resist the work of the therapist.

Most likely the therapist will also use principles of CBT. For one, cognitive therapy will likely be used in an attempt to change Bethany's distortions of reality. She feels that people are rejecting her, but she is probably bringing these rejections on herself. If she can learn to better understand the meaning of other people's actions, she may feel better. And the therapist will likely begin using some techniques of behavior therapy, for instance, by rewarding Bethany for successful social interactions and progress toward meeting her important goals.

The eclectic therapist will continue to monitor Bethany's behavior as the therapy continues, bringing into play whatever therapeutic tools seem most beneficial. Hopefully, Bethany will stay in treatment long enough to make some real progress in repairing her broken life.

One example of an eclectic treatment approach that has been shown to be successful in treating BPD is *dialectical behavioral therapy* (DBT; Linehan & Dimeff, 2001). DBT is essentially a cognitive therapy, but it includes a particular emphasis on attempting to enlist the help of the patient in his or her own treatment. A dialectical behavioral therapist begins by attempting to develop a positive therapeutic alliance with the client, and then tries to encourage the patient to become part of the treatment process. In DBT the therapist aims to accept and validate the client's feelings at any given time while nonetheless informing the client that some feelings and behaviors are maladaptive, and showing the client better alternatives. The therapist will use both individual and group therapy, helping the patient work toward improving interpersonal effectiveness, emotion regulation, and distress tolerance skills.

Summary

Psychoanalysis is based on the principles of Freudian and neo-Freudian personality theories. The goal is to explore the unconscious dynamics of personality. Humanist therapy, derived from the personality theory of Carl Rogers, is based on the idea that people experience psychological problems when they are burdened by limits and expectations placed on them by themselves and others. Its focus is on helping people reach their life goals. Behavior therapy applies the principles of classical and operant conditioning, as well as observational learning, to the elimination of maladaptive behaviors and their replacement with more adaptive responses. Albert Ellis and Aaron Beck developed cognitive-based therapies to help clients stop negative thoughts and replace them with more objective thoughts. Eclectic therapy is the most common approach to treatment. In eclectic therapy, the therapist uses whatever treatment approaches seem most likely to be effective for the client.

Exercises and Critical Thinking

1. Imagine that your friend has been feeling depressed for several months but refuses to consider therapy as an option. What might you tell her that might help her feel more comfortable about seeking treatment?
2. Imagine that you have developed a debilitating fear of bees after recently being attacked by a swarm of them. What type of therapy do you think would be best for your disorder?
3. Imagine that your friend has a serious drug abuse problem. Based on what you've learned in this section, what treatment options would you explore in your attempt to provide him with the best help available? Which combination of therapies might work best?

82.

REDUCING DISORDER BIOLOGICALLY: DRUG AND BRAIN THERAPY

Learning Objectives

- Classify the different types of drugs used in the treatment of mental disorders and explain how they each work to reduce disorder.
- Critically evaluate direct brain intervention methods that may be used by doctors to treat patients who do not respond to drug or other therapy

Like other medical problems, psychological disorders may in some cases be treated biologically. **Biomedical therapies** are *treatments designed to reduce psychological disorder by influencing the action of the central nervous system*. These therapies primarily involve the use of medications but also include direct methods of brain intervention, including *electroconvulsive therapy (ECT)*, *transcranial magnetic stimulation (TMS)*, and *psychosurgery*.

DRUG THERAPIES

Psychologists understand that an appropriate balance of neurotransmitters in the brain is necessary for mental health. If there is a proper balance of chemicals, then the person's mental health will be acceptable, but psychological disorder will result if there is a chemical imbalance. The most frequently used biological treatments provide the patient with medication that influences the production and reuptake of

neurotransmitters in the central nervous system (CNS). The use of these drugs is rapidly increasing, and drug therapy is now the most common approach to treatment of most psychological disorders.

Unlike some medical therapies that can be targeted toward specific symptoms, current psychological drug therapies are not so specific; they don't change particular behaviors or thought processes, and they don't really solve psychological disorders. However, although they cannot "cure" disorder, drug therapies are nevertheless useful therapeutic approaches, particularly when combined with psychological therapy, in treating a variety of psychological disorders. The best drug combination for the individual patient is usually found through trial and error (Biedermann & Fleischhacker, 2009).

The major classes and brand names of drugs used to treat psychological disorders are shown in the table "Common Medications Used to Treat Psychological Disorders".

Common Medications Used to Treat Psychological Disorders

Class	Type	Brand names	Disorder	Notes
Psychostimulants		Ritalin, Adderall, Dexedrine	Attention-deficit/hyperactivity disorder (ADHD)	Very effective in most cases, at least in the short term, at reducing hyperactivity and inattention
	Tricyclics	Elavil, Tofranil	Depression and anxiety disorders	Less frequently prescribed today than are the serotonin reuptake inhibitors (SSRIs)
Antidepressants	Monamine oxidase inhibitors (MAOIs)	Ensam, Nardil, Parnate, Marplan	Depression and anxiety disorders	Less frequently prescribed today than are the SSRIs
	SSRIs	Prozac, Paxil, Zoloft	Depression and anxiety disorders	The most frequently prescribed antidepressant medications; work by blocking the reuptake of serotonin
	Other reuptake inhibitors	Effexor, Celexa, Wellbutrin	Depression and anxiety disorders	Prescribed in some cases; work by blocking the reuptake of serotonin, norepinephrine, and dopamine
Mood stabilizers		Eskalith, Lithobid, Depakene	Bipolar disorder	Effective in reducing the mood swings associated with bipolar disorder
Antianxiety drugs	Tranquilizers (benzodiazepines)	Valium, Xanax	Anxiety, panic, and mood disorders	Work by increasing the action of the neurotransmitter GABA (gamma-aminobutyric acid)
Antipsychotics (Neuroleptics)		Thorazine, Haldol, Clozaril, Risperdal, Zyprexa	Schizophrenia	Treat the positive and, to some extent, the negative symptoms of schizophrenia by reducing the transmission of dopamine and increasing the transmission of serotonin

USING STIMULANTS TO TREAT ADHD

Attention-deficit/hyperactivity disorder (ADHD) is frequently treated with biomedical therapy, usually along with cognitive-behavior therapy (CBT). The most commonly prescribed drugs for ADHD are

psychostimulants, including Ritalin, Adderall, and Dexedrine. Short-acting forms of the drugs are taken as pills and last between 4 and 12 hours, but some of the drugs are also available in long-acting forms (skin patches) that can be worn on the hip and last up to 12 hours. The patch is placed on the child early in the morning and worn all day.

Stimulants improve the major symptoms of ADHD, including inattention, impulsivity, and hyperactivity, often dramatically, in about 75% of the children who take them (Greenhill, Halperin, & Abikof, 1999). But the effects of the drugs wear off quickly. Additionally, the best drug and best dosage varies from child to child, so it may take some time to find the correct combination.

It may seem surprising to you that a disorder that involves hyperactivity is treated with a psychostimulant, a drug that normally increases activity. The answer lies in the dosage. When large doses of stimulants are taken, they increase activity, but in smaller doses the same stimulants improve attention and decrease motor activity (Zahn, Rapoport, & Thompson, 1980).

The most common side effects of psychostimulants in children include decreased appetite, weight loss, sleeping problems, and irritability as the effect of the medication tapers off. Stimulant medications may also be associated with a slightly reduced growth rate in children, although in most cases growth isn't permanently affected (Spencer, Biederman, Harding, & O'Donnell, 1996).

ANTIDEPRESSANT MEDICATIONS

Antidepressant medications are *drugs designed to improve moods*. Although they are used primarily in the treatment of depression, they are also effective for patients who suffer from anxiety, phobias, and obsessive-compulsive disorders. Antidepressants work by influencing the production and reuptake of neurotransmitters that relate to emotion, including serotonin, norepinephrine, and dopamine. Although exactly why they work is not yet known, as the amount of the neurotransmitters in the CNS is increased through the action of the drugs, the person often experiences less depression.

The original antidepressants were the *tricyclic antidepressants*, with the brand names of Tofranil and Elavil, and the *monoamine oxidase inhibitors (MAOIs)*. These medications work by increasing the amount of serotonin, norepinephrine, and dopamine at the synapses, but they also have severe side effects including potential increases in blood pressure and the need to follow particular diets.

The antidepressants most prescribed today are the *selective serotonin reuptake inhibitors (SSRIs)*, including Prozac, Paxil, and Zoloft, which are designed to selectively block the reuptake of serotonin at the synapse, thereby leaving more serotonin available in the CNS. SSRIs are safer and have fewer side effects than the tricyclics or the MAOIs (Fraser, 2000; Hollon, Thase, & Markowitz, 2002). SSRIs are effective, but patients

taking them often suffer a variety of sometimes unpleasant side effects, including dry mouth, constipation, blurred vision, headache, agitation, drowsiness, as well as a reduction in sexual enjoyment.

Recently, there has been concern that SSRIs may increase the risk of suicide among teens and young adults, probably because when the medications begin working they give patients more energy, which may lead them to commit the suicide that they had been planning but lacked the energy to go through with. This concern has led the FDA to put a warning label on SSRI medications and has led doctors to be more selective about prescribing antidepressants to this age group (Healy & Whitaker, 2003; Simon, 2006; Simon, Savarino, Operskalski, & Wang, 2006).

Because the effects of antidepressants may take weeks or even months to develop, doctors usually work with each patient to determine which medications are most effective, and may frequently change medications over the course of therapy. In some cases other types of antidepressants may be used instead of or in addition to the SSRIs. These medications also work by blocking the reuptake of neurotransmitters, including serotonin, norepinephrine, and dopamine. Brand names of these medications include Effexor and Wellbutrin.

Patients who are suffering from bipolar disorder are not helped by the SSRIs or other antidepressants because their disorder also involves the experience of overly positive moods. Treatment is more complicated for these patients, often involving a combination of antipsychotics and antidepressants along with *mood stabilizing medications* (McElroy & Keck, 2000). The most well-known mood stabilizer, lithium carbonate (or “lithium”), was approved by the FDA in the 1970s for treating both manic and depressive episodes, and it has proven very effective. Anticonvulsant medications can also be used as mood stabilizers. Another drug, Depakote, has also proven very effective, and some bipolar patients may do better with it than with lithium (Kowatch et al., 2000).

People who take lithium must have regular blood tests to be sure that the levels of the drug are in the appropriate range. Potential negative side effects of lithium are loss of coordination, slurred speech, frequent urination, and excessive thirst. Though side effects often cause patients to stop taking their medication, it is important that treatment be continuous, rather than intermittent. There is no cure for bipolar disorder, but drug therapy does help many people.

ANTIANXIETY MEDICATIONS

Antianxiety medications are *drugs that help relieve fear or anxiety*. They work by increasing the action of the neurotransmitter GABA. The increased level of GABA helps inhibit the action of the sympathetic division of the autonomic nervous system, creating a calming experience.

The most common class of antianxiety medications is the *tranquilizers*, known as *benzodiazepines*. These

drugs, which are prescribed millions of times a year, include Ativan, Valium, and Xanax. The benzodiazepines act within a few minutes to treat mild anxiety disorders but also have major side effects. They are addictive, frequently leading to tolerance, and they can cause drowsiness, dizziness, and unpleasant withdrawal symptoms including relapses into increased anxiety (Otto et al., 1993). Furthermore, because the effects of the benzodiazepines are very similar to those of alcohol, they are very dangerous when combined with it.

ANTIPSYCHOTIC MEDICATIONS

Until the middle of the 20th century, schizophrenia was inevitably accompanied by the presence of positive symptoms, including bizarre, disruptive, and potentially dangerous behavior. As a result, schizophrenics were locked in asylums to protect them from themselves and to protect society from them. In the 1950s, a drug called chlorpromazine (Thorazine) was discovered that could reduce many of the positive symptoms of schizophrenia. Chlorpromazine was the first of many *antipsychotic drugs*.

Antipsychotic drugs (neuroleptics) are *drugs that treat the symptoms of schizophrenia and related psychotic disorders*. Today there are many antipsychotics, including Thorazine, Haldol, Clozaril, Risperdal, and Zyprexa. Some of these drugs treat the positive symptoms of schizophrenia, and some treat both the positive, negative, and cognitive symptoms.

The discovery of chlorpromazine and its use in clinics has been described as the single greatest advance in psychiatric care, because it has dramatically improved the prognosis of patients in psychiatric hospitals worldwide. Using antipsychotic medications has allowed hundreds of thousands of people to move out of asylums into individual households or community mental health centers, and in many cases to live near-normal lives.

Antipsychotics reduce the positive symptoms of schizophrenia by reducing the transmission of dopamine at the synapses in the limbic system, and they improve negative symptoms by influencing levels of serotonin (Marangell, Silver, Goff, & Yudofsky, 2003). Despite their effectiveness, antipsychotics have some negative side effects, including restlessness, muscle spasms, dizziness, and blurred vision. In addition, their long-term use can cause permanent neurological damage, a condition called *tardive dyskinesia* that causes uncontrollable muscle movements, usually in the mouth area (National Institute of Mental Health, 2008)¹. Newer antipsychotics treat more symptoms with fewer side effects than older medications do (Casey, 1996).

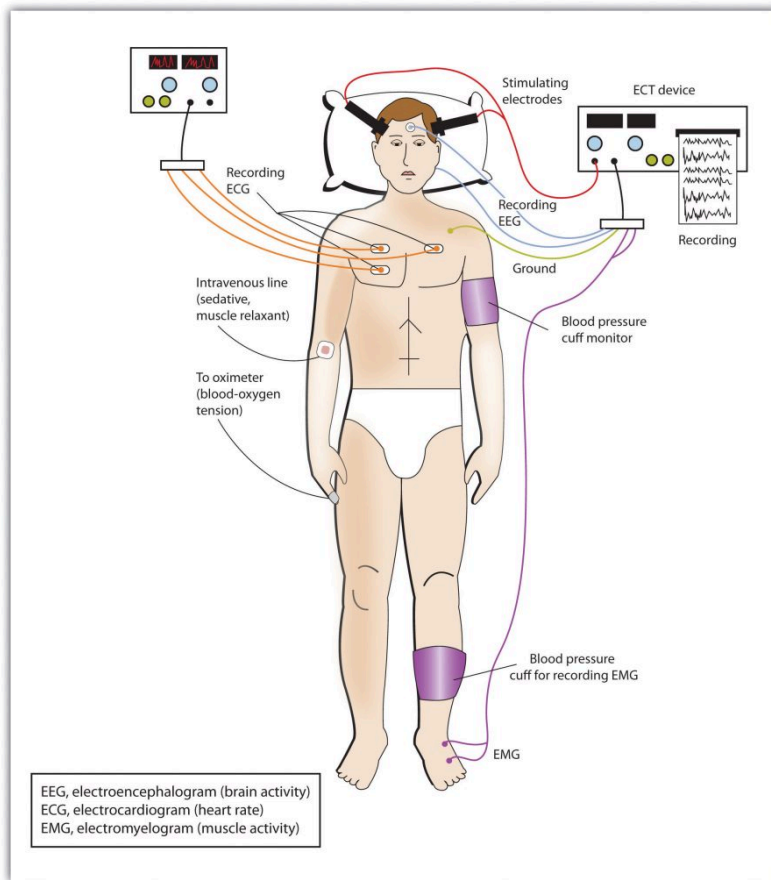
DIRECT BRAIN INTERVENTION THERAPIES

In cases of severe disorder it may be desirable to directly influence brain activity through electrical activation of the brain or through brain surgery. **Electroconvulsive therapy (ECT)** is *a medical procedure designed to alleviate psychological disorder in which electric currents are passed through the brain, deliberately triggering a brief seizure* (figure “Electroconvulsive Therapy [ECT]”). ECT has been used since the 1930s to treat severe depression.

When it was first developed, the procedure involved strapping the patient to a table before the electricity was administered. The patient was knocked out by the shock, went into severe convulsions, and awoke later, usually without any memory of what had happened. Today ECT is used only in the most severe cases when all other treatments have failed, and the practice is more humane. The patient is first given muscle relaxants and a general anesthesia, and precisely calculated electrical currents are used to achieve the most benefit with the fewest possible risks.

ECT is very effective; about 80% of people who undergo three sessions of ECT report dramatic relief from their depression. ECT reduces suicidal thoughts and is assumed to have prevented many suicides (Kellner et al., 2005). On the other hand, the positive effects of ECT do not always last; over one-half of patients who undergo ECT experience relapse within one year, although antidepressant medication can help reduce this outcome (Sackheim et al., 2001). ECT may also cause short-term memory loss or cognitive impairment (Abrams, 1997; Sackheim et al., 2007).

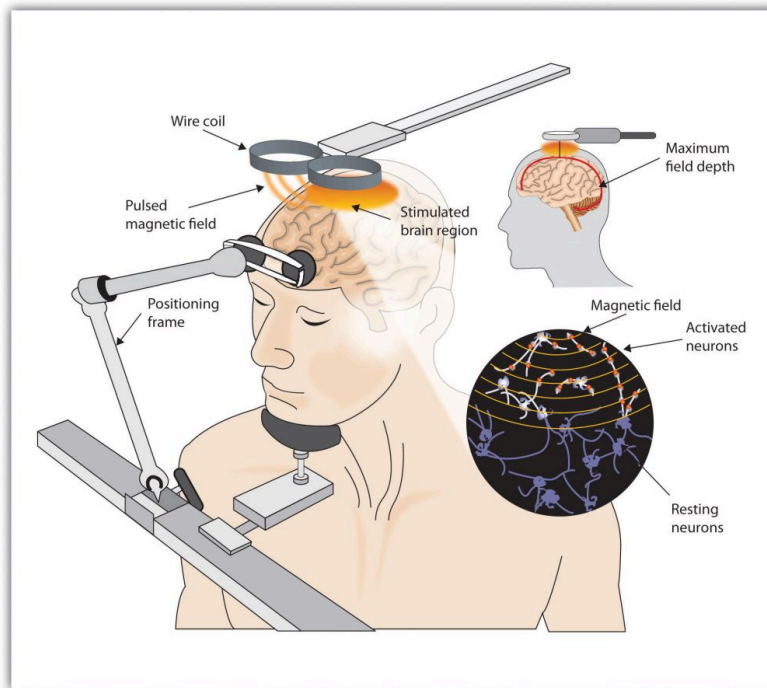
Electroconvulsive Therapy (ECT)



Today's ECT uses precisely calculated electrical currents to achieve the most benefit with the fewest possible risks.

Although ECT continues to be used, newer approaches to treating chronic depression are also being developed. A newer and gentler method of brain stimulation is **transcranial magnetic stimulation (TMS)**, *a medical procedure designed to reduce psychological disorder that uses a pulsing magnetic coil to electrically stimulate the brain* (see figure “Transcranial Magnetic Stimulation [TMS]”). TMS seems to work by activating neural circuits in the prefrontal cortex, which is less active in people with depression, causing an elevation of mood. TMS can be performed without sedation, does not cause seizures or memory loss, and may be as effective as ECT (Loo, Schweitzer, & Pratt, 2006; Rado, Dowd, & Janicak, 2008). TMS has also been used in the treatment of Parkinson’s disease and schizophrenia.

Transcranial Magnetic Stimulation (TMS)



TMS is a noninvasive procedure that uses a pulsing magnetic coil to electrically stimulate the brain. Recently, TMS has been used in the treatment of Parkinson's disease.

Still other biomedical therapies are being developed for people with severe depression that persists over years. One approach involves implanting a device in the chest that stimulates the vagus nerve, a major nerve that descends from the brain stem toward the heart (Corcoran, Thomas, Phillips, & O'Keane, 2006; Nemeroff et al., 2006). When the vagus nerve is stimulated by the device, it activates brain structures that are less active in severely depressed people.

Psychosurgery, that is, *surgery that removes or destroys brain tissue in the hope of improving disorder*, is reserved for the most severe cases. The most well-known psychosurgery is the *prefrontal lobotomy*. Developed in 1935 by Nobel Prize winner Egas Moniz to treat severe phobias and anxiety, the procedure destroys the connections between the prefrontal cortex and the rest of the brain. Lobotomies were performed on thousands of patients. The procedure—which was never validated scientifically—left many patients in worse condition than before, subjecting the already suffering patients and their families to further heartbreak (Valenstein, 1986). Perhaps the most notable failure was the lobotomy performed on Rosemary Kennedy, the sister of President John F. Kennedy, which left her severely incapacitated.

There are very few centers that still conduct psychosurgery today, and when such surgeries are performed they are much more limited in nature and called *cingulotomy* (Dougherty et al., 2002). The ability to more accurately image and localize brain structures using modern neuroimaging techniques suggests that new, more accurate, and more beneficial developments in psychosurgery may soon be available (Sachdev & Chen, 2009).

83.

REDUCING DISORDER BY CHANGING THE SOCIAL SITUATION

Learning Objectives

- Explain the advantages of group therapy and self-help groups for treating disorder.
- Evaluate the procedures and goals of community mental health services.

Although the individual therapies that we have discussed so far in this chapter focus primarily on the psychological and biological aspects of the bio-psycho-social model of disorder, the social dimension is never out of the picture. Therapists understand that disorder is caused, and potentially prevented, in large part by the people with whom we interact. A person with schizophrenia does not live in a vacuum. He interacts with his family members and with the other members of the community, and the behavior of those people may influence his disease. And depression and anxiety are created primarily by the affected individual's perceptions (and misperceptions) of the important people around them. Thus prevention and treatment are influenced in large part by the social context in which the person is living.

GROUP, COUPLES, AND FAMILY THERAPY

Practitioners sometimes incorporate the social setting in which disorder occurs by conducting therapy in groups. **Group therapy** is *psychotherapy in which clients receive psychological treatment together with others*.

A professionally trained therapist guides the group, usually between 6 and 10 participants, to create an atmosphere of support and emotional safety for the participants (Yalom & Leszcz, 2005).

Group therapy provides a safe place where people come together to share problems or concerns, to better understand their own situations, and to learn from and with each other. Group therapy is often cheaper than individual therapy, as the therapist can treat more people at the same time, but economy is only one part of its attraction. Group therapy allows people to help each other, by sharing ideas, problems, and solutions. It provides social support, offers the knowledge that other people are facing and successfully coping with similar situations, and allows group members to model the successful behaviors of other group members. Group therapy makes explicit the idea that our interactions with others may create, intensify, and potentially alleviate disorders.

Group therapy has met with much success in the more than 50 years it has been in use, and it has generally been found to be as or more effective than individual therapy (McDermut, Miller, & Brown, 2001). Group therapy is particularly effective for people who have life-altering illness, as it helps them cope better with their disease, enhances the quality of their lives, and in some cases has even been shown to help them live longer (American Group Psychotherapy Association, 2000)¹.



Figure 13.9: Group therapy provides a therapeutic setting where people meet with others to share problems or concerns, to better understand their own situation, and to learn from and with each other. Rose Physical Therapy Group – strider -_-10 – CC BY 2.0.

Sometimes group therapy is conducted with people who are in close relationships. *Couples therapy* is treatment in which two people who are cohabitating, married, or dating meet together with the practitioner to discuss their concerns and issues about their relationship. These therapies are in some cases educational, providing the couple with information about what is to be expected in a relationship. The therapy may focus on such topics as sexual enjoyment, communication, or the symptoms of one of the partners (e.g., depression).

Family therapy involves families meeting together with a therapist. In some cases the meeting is precipitated by a particular problem with one family member, such as a diagnosis of bipolar disorder in a child. Family therapy is based on the assumption that the problem, even if it is primarily affecting one person, is the result of an interaction among the people in the family.

SELF-HELP GROUPS

Group therapy is based on the idea that people can be helped by the positive social relationships that others provide. One way for people to gain this social support is by joining a **self-help group**, which is *a voluntary association of people who share a common desire to overcome psychological disorder or improve their well-being* (Humphreys & Rappaport, 1994). Self-help groups have been used to help individuals cope with many types of addictive behaviors. Three of the best-known self-help groups are Alcoholics Anonymous, of which there are more than two million members in the United States, Gamblers Anonymous, and Overeaters Anonymous.

The idea behind self-groups is very similar to that of group therapy, but the groups are open to a broader spectrum of people. As in group therapy, the benefits include social support, education, and observational learning. Religion and spirituality are often emphasized, and self-blame is discouraged. Regular group meetings are held with the supervision of a trained leader.

COMMUNITY MENTAL HEALTH: SERVICE AND PREVENTION

The social aspect of disorder is also understood and treated at the community level. **Community mental**

health services are *psychological treatments and interventions that are distributed at the community level*. Community mental health services are provided by nurses, psychologists, social workers, and other professionals in sites such as schools, hospitals, police stations, drug treatment clinics, and residential homes. The goal is to establish programs that will help people get the mental health services that they need (Gonzales, Kelly, Mowbray, Hays, & Snowden, 1991).

Unlike traditional therapy, the primary goal of community mental health services is prevention. Just as widespread vaccination of children has eliminated diseases such as polio and smallpox, mental health services are designed to prevent psychological disorder (Institute of Medicine, 1994)². Community prevention can be focused on one more of three levels: primary prevention, secondary prevention, and tertiary prevention.

Primary prevention is prevention in which all members of the community receive the treatment. Examples of primary prevention are programs designed to encourage all pregnant women to avoid cigarettes and alcohol because of the risk of health problems for the fetus, and programs designed to remove dangerous lead paint from homes.

Secondary prevention is more limited and focuses on people who are most likely to need it—those who display *risk factors* for a given disorder. **Risk factors** are *the social, environmental, and economic vulnerabilities that make it more likely than average that a given individual will develop a disorder* (Werner & Smith, 1992). The following presents a list of potential risk factors for psychological disorders.

SOME RISK FACTORS FOR PSYCHOLOGICAL DISORDERS

Community mental health workers practicing secondary prevention will focus on youths with these markers of future problems.

- Academic difficulties
- Attention-deficit/hyperactivity disorder (ADHD)
- Child abuse and neglect
- Developmental disorders
- Drug and alcohol abuse
- Dysfunctional family
- Early pregnancy
- Emotional immaturity
- Homelessness
- Learning disorder
- Low birth weight
- Parental mental illness

- Poor nutrition
- Poverty

Finally, *tertiary prevention* is treatment, such as psychotherapy or biomedical therapy, that focuses on people who are already diagnosed with disorder.

Community prevention programs are designed to provide support during childhood or early adolescence with the hope that the interventions will prevent disorders from appearing or will keep existing disorders from expanding. Interventions include such things as help with housing, counseling, group therapy, emotional regulation, job and skills training, literacy training, social responsibility training, exercise, stress management, rehabilitation, family therapy, or removing a child from a stressful or dangerous home situation.

The goal of community interventions is to make it easier for individuals to continue to live a normal life in the face of their problems. Community mental health services are designed to make it less likely that vulnerable populations will end up in institutions or on the streets. In summary, their goal is to allow at-risk individuals to continue to participate in community life by assisting them within their own communities.

RESEARCH FOCUS: THE IMPLICIT ASSOCIATION TEST AS A BEHAVIORAL MARKER FOR SUICIDE

Secondary prevention focuses on people who are at risk for disorder or for harmful behaviors. Suicide is a leading cause of death worldwide, and prevention efforts can help people consider other alternatives, particularly if it can be determined who is most at risk. Determining whether a person is at risk of suicide is difficult, however, because people are motivated to deny or conceal such thoughts to avoid intervention or hospitalization. One recent study found that 78% of patients who die by suicide explicitly deny suicidal thoughts in their last verbal communications before killing themselves (Busch, Fawcett, & Jacobs, 2003).

Nock et al. (2010) tested the possibility that implicit measures of the association between the self-concept and death might provide a more direct behavioral marker of suicide risk that would allow professionals to more accurately determine whether a person is likely to commit suicide in comparison to existing self-report measures. They measured implicit associations about death and suicide in 157 people seeking treatment at a psychiatric emergency department.

The participants all completed a version of the Implicit Association Test (IAT), which was designed to assess the strength of a person's mental associations between death and the self (Greenwald, McGhee, & Schwartz, 1998). Using a notebook computer, participants classified stimuli representing the constructs of "death" (i.e., die, dead, deceased, lifeless, and suicide) and "life" (i.e., alive, survive, live, thrive, and breathing) and the attributes of "me" (i.e., I, myself, my, mine, and self) and "not me" (i.e., they, them, their, theirs, and other). Response latencies for all trials were recorded and analyzed, and the strength of each participant's association between "death" and "me" was calculated.

The researchers then followed participants over the next 6 months to test whether the measured implicit association of death with self could be used to predict future suicide attempts. The authors also tested whether scores on the IAT would add to prediction of risk above and beyond other measures of risk, including questionnaire and interview measures of suicide risk. Scores on the IAT predicted suicide attempts in the next 6 months above all the other risk factors that were collected by the hospital staff, including past history of suicide attempts. These results suggest that measures of implicit cognition may be useful for determining risk factors for clinical behaviors such as suicide.

84.

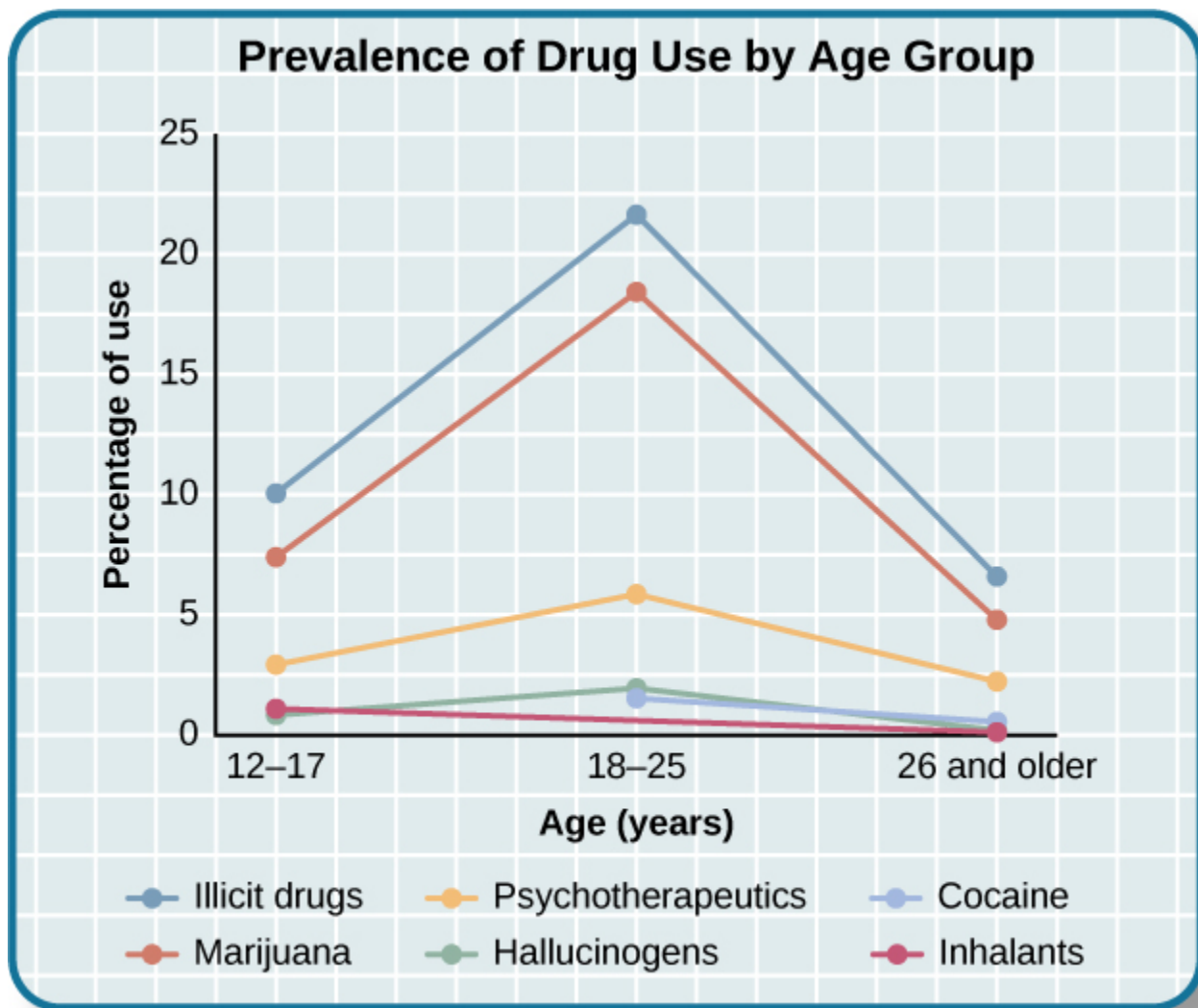
SUBSTANCE-RELATED AND ADDICTIVE DISORDERS: A SPECIAL CASE

Learning Objectives

By the end of this section, you will be able to:

- Recognize the goal of substance-related and addictive disorders treatment
- Discuss what makes for effective treatment

Addiction is often viewed as a chronic disease. The choice to use a substance is initially voluntary; however, because chronic substance use can permanently alter the neural structure in the prefrontal cortex, an area of the brain associated with decision-making and judgment, a person becomes driven to use drugs and/or alcohol (Muñoz-Cuevas, Athilingam, Piscopo, & Wilbrecht, 2013). This helps explain why relapse rates tend to be high. About 40%–60% of individuals **relapse**, which means they return to abusing drugs and/or alcohol after a period of improvement (National Institute on Drug Abuse [NIDA], 2008).



The National Survey on Drug Use and Health shows trends in prevalence of various drugs for ages 12-17, 18-25, and 26 or older.

The goal of substance-related treatment is to help an addicted person stop compulsive drug-seeking behaviors (NIDA, 2012). This means an addicted person will need long-term treatment, similar to a person battling a chronic physical disease such as hypertension or diabetes. Treatment usually includes behavioral therapy and/or medication, depending on the individual (NIDA, 2012). Specialized therapies have also been developed for specific types of substance-related disorders, including alcohol, cocaine, and opioids (McGovern & Carroll, 2003). Substance-related treatment is considered much more cost-effective than incarceration or not treating those with addictions (NIDA, 2012).



Substance use and abuse costs the United States over \$600 billion a year (NIDA, 2012). This addict is using heroin. (credit: "jellymc – urbansnaps"/Flickr)

What Makes Treatment Effective?

Specific factors make substance-related treatment much more effective. One factor is duration of treatment. Generally, the addict needs to be in treatment for at least three months to achieve a positive outcome (Simpson, 1981; Simpson, Joe, & Bracy, 1982; NIDA, 2012). This is due to the psychological, physiological, behavioral, and social aspects of abuse (Simpson, 1981; Simpson et al., 1982; NIDA, 2012). While in treatment, an addict might receive behavior therapy, which can help motivate the addict to participate in the treatment program and teach strategies for dealing with cravings and how to prevent relapse. Also, treatment needs to be holistic and address multiple needs, not just the drug addiction. This means that treatment will address factors such as communication, stress management, relationship issues, parenting, vocational concerns, and legal concerns (McGovern & Carroll, 2003; NIDA, 2012).

While individual therapy is used in the treatment of substance-related disorders, group therapy is the most widespread treatment modality (Weiss, Jaffee, de Menil, & Cogley, 2004). The rationale behind using group therapy for addiction treatment is that addicts are much more likely to maintain sobriety in a group format. It has been suggested that this is due to the rewarding and therapeutic benefits of the group, such as support, affiliation, identification, and even confrontation (Center for Substance Abuse Treatment, 2005). For teenagers, the whole family often needs to participate in treatment to address issues such as family dynamics, communication, and relapse prevention. Family involvement in teen drug addiction is vital. Research suggests

that greater parental involvement is correlated with a greater reduction in use by teen substance abusers. Also, mothers who participated in treatment displayed better mental health and greater warmth toward their children (Bertrand et al., 2013). However, neither individual nor group therapy has been found to be more effective (Weiss et al., 2004). Regardless of the type of treatment service, the primary focus is on abstinence or at the very least a significant reduction in use (McGovern & Carroll, 2003).

Treatment also usually involves medications to detox the addict safely after an overdose, to prevent seizures and agitation that often occur in detox, to prevent reuse of the drug, and to manage withdrawal symptoms. Getting off drugs often involves the use of drugs—some of which can be just as addictive. Detox can be difficult and dangerous.

Watch this video to find out more about treating substance-related disorders using the biological, behavioral, and psychodynamic approaches: [Treating Substance-Related Disorders: Biological, Behavioral and Psychodynamic Approaches](#).

Comorbid Disorders

Frequently, a person who is addicted to drugs and/or alcohol has an additional psychological disorder. Saying a person has comorbid disorders means the individual has two or more diagnoses. This can often be a substance-related diagnosis and another psychiatric diagnosis, such as depression, bipolar disorder, or schizophrenia. These individuals fall into the category of mentally ill and chemically addicted (MICA)—their problems are often chronic and expensive to treat, with limited success. Compared with the overall population, substance abusers are twice as likely to have a mood or anxiety disorder. Drug abuse can cause symptoms of mood and anxiety disorders and the reverse is also true—people with debilitating symptoms of a psychiatric disorder may self-medicate and abuse substances.

In cases of comorbidity, the best treatment is thought to address both (or multiple) disorders simultaneously (NIDA, 2012). Behavior therapies are used to treat comorbid conditions, and in many cases, psychotropic medications are used along with psychotherapy. For example, evidence suggests that bupropion (trade names: Wellbutrin and Zyban), approved for treating depression and nicotine dependence, might also help reduce craving and use of the drug methamphetamine (NIDA, 2011). However, more research is needed to better understand how these medications work—particularly when combined in patients with comorbidities.

Test Your Understanding



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=487#h5p-139>

Summary

Addiction is often viewed as a chronic disease that rewires the brain. This helps explain why relapse rates tend to be high, around 40%–60% (McLellan, Lewis, & O'Brien, & Kleber, 2000). The goal of treatment is to help an addict stop compulsive drug-seeking behaviors. Treatment usually includes behavioral therapy, which can take place individually or in a group setting. Treatment may also include medication. Sometimes a person has comorbid disorders, which usually means that they have a substance-related disorder diagnosis and another psychiatric diagnosis, such as depression, bipolar disorder, or schizophrenia. The best treatment would address both problems simultaneously.

Review Questions



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://louis.pressbooks.pub/intropsychology/?p=487#h5p-140>

Critical Thinking Question

You are conducting an intake assessment. Your client is a 45-year-old single, employed male with cocaine dependence. He failed a drug screen at work and is mandated to treatment by his employer if he wants to keep his job. Your client admits that he needs help. Why would you recommend group therapy for him?

The rationale behind using group therapy for addiction treatment is that addicts are much more likely to maintain sobriety when treatment is in a group format. It has been suggested that it's due to the rewarding and therapeutic benefits of the group, such as support, affiliation, identification, and even confrontation. Because this client is single, he may not have family support, so support from the group may be even more important in his ability to recover and maintain his sobriety.

Personal Application Question

What are some substance-related and addictive disorder treatment facilities in your community, and what types of services do they provide? Would you recommend any of them to a friend or family member with a substance abuse problem? Why or why not?

85.

EVALUATING TREATMENT AND PREVENTION: WHAT WORKS?

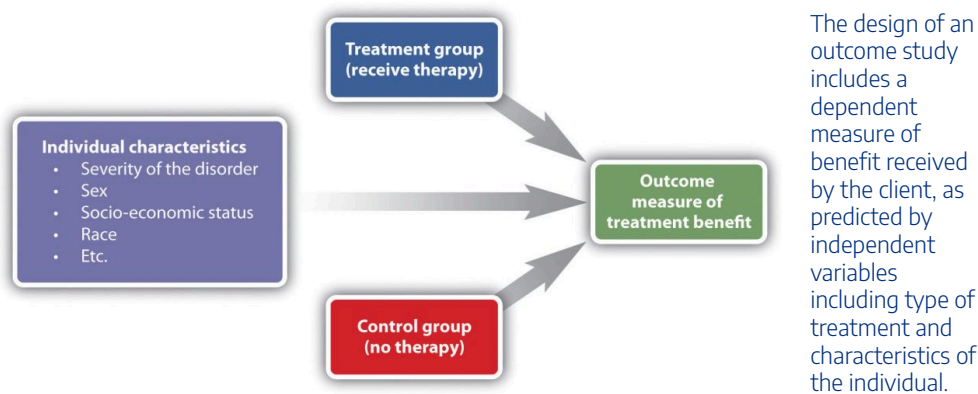
Learning Objectives

- Summarize the ways that scientists evaluate the effectiveness of psychological, behavioral, and community service approaches to preventing and reducing disorders.
- Summarize which types of therapy are most effective for which disorders.

We have seen that psychologists and other practitioners employ a variety of treatments in their attempts to reduce the negative outcomes of psychological disorders. But we have not yet considered the important question of whether these treatments are effective, and if they are, which approaches are most effective for which people and for which disorders. Accurate empirical answers to these questions are important as they help practitioners focus their efforts on the techniques that have been proven to be most promising, and will guide societies as they make decisions about how to spend public money to improve the quality of life of their citizens (Hunsley & Di Giulio, 2002).

Psychologists use **outcome research**, that is, *studies that assess the effectiveness of medical treatments*, to determine the effectiveness of different therapies. As you can see in Figure “Outcome Research”, in these studies the independent variable is the type of the treatment—for instance, whether it was psychological or biological in orientation or how long it lasted. In most cases characteristics of the client (e.g., his or her gender, age, disease severity, and prior psychological histories) are also collected as control variables. The dependent measure is an assessment of the benefit received by the client. In some cases we might simply ask the client if she feels better, and in other cases we may directly measure behavior: Can the client now get in the airplane and take a flight? Has the client remained out of juvenile detention?

Outcome Research



In every case the scientists evaluating the therapy must keep in mind the potential that other effects rather than the treatment itself might be important, that some treatments that seem effective might not be, and that some treatments might actually be harmful, at least in the sense that money and time are spent on programs or drugs that do not work.

One threat to the validity of outcome research studies is *natural improvement*—the possibility that people might get better over time, even without treatment. People who begin therapy or join a self-help group do so because they are feeling bad or engaging in unhealthy behaviors. After being in a program over a period of time, people frequently feel that they are getting better. But it is possible that they would have improved even if they had not attended the program, and that the program is not actually making a difference. To demonstrate that the treatment is effective, the people who participate in it must be compared with another group of people who do not get treatment.

Another possibility is that therapy works, but that it doesn't really matter which type of therapy it is. *Nonspecific treatment effects* occur when the patient gets better over time simply by coming to therapy, even though it doesn't matter what actually happens at the therapy sessions. The idea is that therapy works, in the sense that it is better than doing nothing, but that all therapies are pretty much equal in what they are able to accomplish. Finally, *placebo effects* are improvements that occur as a result of the expectation that one will get better rather than from the actual effects of a treatment.

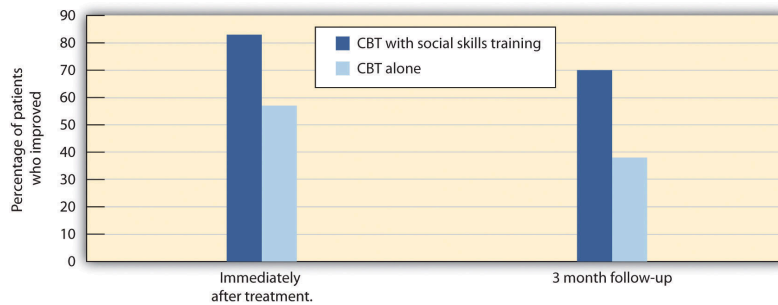
EFFECTIVENESS OF PSYCHOLOGICAL THERAPY

Thousands of studies have been conducted to test the effectiveness of psychotherapy, and by and large they find evidence that it works. Some outcome studies compare a group that gets treatment with another (control) group that gets no treatment. For instance, Ruwaard, Broeksteeg, Schrieken, Emmelkamp, and Lange (2010) found that patients who interacted with a therapist over a website showed more reduction in symptoms of panic disorder than did a similar group of patients who were on a waiting list but did not get therapy. Although studies such as this one control for the possibility of natural improvement (the treatment group improved more than the control group, which would not have happened if both groups had only been improving naturally over time), they do not control for either nonspecific treatment effects or for placebo effects. The people in the treatment group might have improved simply by being in the therapy (nonspecific effects), or they may have improved because they expected the treatment to help them (placebo effects).

An alternative is to compare a group that gets “real” therapy with a group that gets only a placebo. For instance, Keller et al. (2001) had adolescents who were experiencing anxiety disorders take pills that they thought would reduce anxiety for 8 weeks. However, one-half of the patients were randomly assigned to actually receive the antianxiety drug Paxil, while the other half received a placebo drug that did not have any medical properties. The researchers ruled out the possibility that only placebo effects were occurring because they found that both groups improved over the 8 weeks, but the group that received Paxil improved significantly more than the placebo group did.

Studies that use a control group that gets no treatment or a group that gets only a placebo are informative, but they also raise ethical questions. If the researchers believe that their treatment is going to work, why would they deprive some of their participants, who are in need of help, of the possibility for improvement by putting them in a control group?

Another type of outcome study compares different approaches with each other. For instance, Herbert et al. (2005) tested whether social skills training could boost the results received for the treatment of social anxiety disorder with cognitive-behavioral therapy (CBT) alone. As you can see in the figure below, they found that people in both groups improved, but CBT coupled with social skills training showed significantly greater gains than CBT alone.



Herbert et al. (2005) compared the effectiveness of CBT alone with CBT along with social skills training. Both groups improved, but the group that received both therapies had significantly greater gains than the group that received CBT alone.

Adapted from Herbert, J. D., Gaudiano, B. A., Rheingold, A. A., Myers, V. H., Dalrymple, K., & Nolan, E. M. (2005). Social skills training augments the effectiveness of cognitive behavioral group therapy for social anxiety disorder. *Behavior Therapy*, 36(2), 125-138.

Other studies (Crits-Christoph, 1992; Crits-Christoph et al., 2004) have compared brief sessions of psychoanalysis with longer-term psychoanalysis in the treatment of anxiety disorder, humanistic therapy with psychodynamic therapy in treating depression, and cognitive therapy with drug therapy in treating anxiety (Dalglish, 2004; Hollon, Thase, & Markowitz, 2002). These studies are advantageous because they compare the specific effects of one type of treatment with another, while allowing all patients to get treatment.

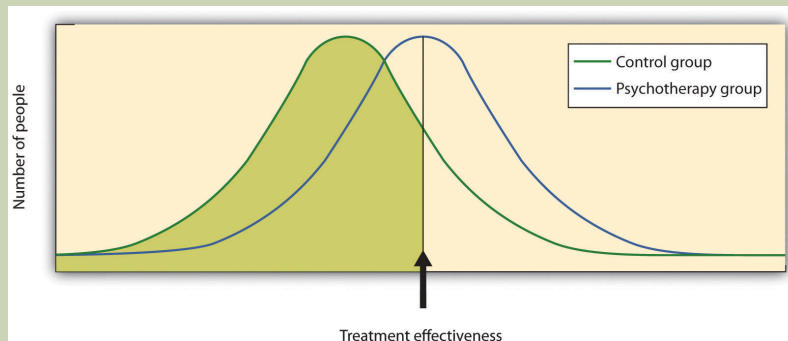
RESEARCH FOCUS: META-ANALYZING CLINICAL OUTCOMES

Because there are thousands of studies testing the effectiveness of psychotherapy, and the independent and dependent variables in the studies vary widely, the results are often combined using a *meta-analysis*. A **meta-analysis** is a statistical technique that uses the results of existing studies to integrate and draw conclusions about those studies. In one important meta-analysis analyzing the effect of psychotherapy, Smith, Glass, and Miller (1980) summarized studies that compared different types of therapy or that compared the effectiveness of therapy against a

control group. To find the studies, the researchers systematically searched computer databases and the reference sections of previous research reports to locate every study that met the inclusion criteria. Over 475 studies were located, and these studies used over 10,000 research participants.

The results of each of these studies were systematically coded, and a measure of the effectiveness of treatment known as the *effect size* was created for each study. Smith and her colleagues found that the average effect size for the influence of therapy was 0.85, indicating that psychotherapy had a relatively large positive effect on recovery. What this means is that, overall, receiving psychotherapy for behavioral problems is substantially better for the individual than not receiving therapy (Figure “Normal Curves of Those Who Do and Do Not Get Treatment”). Although they did not measure it, psychotherapy presumably has large societal benefits as well—the cost of the therapy is likely more than made up for by the increased productivity of those who receive it.

Normal Curves of Those Who Do and Do Not Get Treatment



Meta-analyses of the outcomes of psychotherapy have found that, on average, the distribution for people who get treatment is higher than for those who do not get treatment.

Other meta-analyses have also found substantial support for the effectiveness of specific therapies, including cognitive therapy, CBT (Butler, Chapman, Forman, & Beck, 2006; Deacon & Abramowitz, 2004), couples and family therapy (Shadish & Baldwin, 2002), and psychoanalysis (Shedler, 2010). On the basis of these and other meta-analyses, a list of *empirically supported therapies*—that is, therapies that are known to be effective—has been developed (Chambless & Hollon, 1998; Hollon, Stewart, & Strunk, 2006). These therapies include cognitive therapy and behavioral therapy for depression; cognitive therapy, exposure therapy, and stress inoculation training for anxiety; CBT for bulimia; and behavior modification for bed-wetting.

Smith, Glass, and Miller (1980) did not find much evidence that any one type of therapy was more effective than any other type, and more recent meta-analyses have not tended to find many differences either (Cuijpers, van Straten, Andersson, & van Oppen, 2008). What this means is that a good part of the effect of therapy is nonspecific, in the sense that simply coming to any type of therapy is helpful in comparison to not coming. This is true partly because there are fewer distinctions among the ways that different therapies are practiced

than the theoretical differences among them would suggest. What a good therapist practicing psychodynamic approaches does in therapy is often not much different from what a humanist or a cognitive-behavioral therapist does, and so no one approach is really likely to be better than the other.

What all good therapies have in common is that they give people hope; help them think more carefully about themselves and about their relationships with others; and provide a positive, empathic, and trusting relationship with the therapist—the therapeutic alliance (Ahn & Wampold, 2001). This is why many self-help groups are also likely to be effective and perhaps why having a psychiatric service dog may also make us feel better.

EFFECTIVENESS OF BIOMEDICAL THERAPIES

Although there are fewer of them because fewer studies have been conducted, meta-analyses also support the effectiveness of drug therapies for psychological disorder. For instance, the use of psychostimulants to reduce the symptoms of attention-deficit/hyperactivity disorder (ADHD) is well known to be successful, and many studies find that the positive and negative symptoms of schizophrenia are substantially reduced by the use of antipsychotic medications (Lieberman et al., 2005).

People who take antidepressants for mood disorders or antianxiety medications for anxiety disorders almost always report feeling better, although drugs are less helpful for phobic disorder and obsessive-compulsive disorder. Some of these improvements are almost certainly the result of placebo effects (Cardeña & Kirsch, 2000), but the medications do work, at least in the short term. An analysis of U.S. Food and Drug Administration databases found effect sizes of 0.26 for Prozac, 0.26 for Zoloft, 0.24 for Celexa, 0.31 for Lexapro, and 0.30 for Cymbalta. The overall average effect size for antidepressant medications approved by the FDA between 1987 and 2004 was 0.31 (Deshauer et al., 2008; Turner, Matthews, Linardatos, Tell, & Rosenthal, 2008).

One problem with drug therapies is that although they provide temporary relief, they don't treat the underlying cause of the disorder. Once the patient stops taking the drug, the symptoms often return in full force. In addition many drugs have negative side effects, and some also have the potential for addiction and abuse. Different people have different reactions, and all drugs carry warning labels. As a result, although these drugs are frequently prescribed, doctors attempt to prescribe the lowest doses possible for the shortest possible periods of time.

Older patients face special difficulties when they take medications for mental illness. Older people are more

sensitive to drugs, and drug interactions are more likely because older patients tend to take a variety of different drugs every day. They are more likely to forget to take their pills, to take too many or too few, or to mix them up due to poor eyesight or faulty memory.

Like all types of drugs, medications used in the treatment of mental illnesses can carry risks to an unborn infant. Tranquilizers should not be taken by women who are pregnant or expecting to become pregnant, because they may cause birth defects or other infant problems, especially if taken during the first trimester. Some selective serotonin reuptake inhibitors (SSRIs) may also increase risks to the fetus (Louik, Lin, Werler, Hernandez, & Mitchell, 2007; U.S. Food and Drug Administration, 2004)¹, as do antipsychotics (Diav-Citrin et al., 2005).

Decisions on medication should be carefully weighed and based on each person's needs and circumstances. Medications should be selected based on available scientific research, and they should be prescribed at the lowest possible dose. All people must be monitored closely while they are on medications.

EFFECTIVENESS OF SOCIAL-COMMUNITY APPROACHES

Measuring the effectiveness of community action approaches to mental health is difficult because they occur in community settings and impact a wide variety of people, and it is difficult to find and assess valid outcome measures. Nevertheless, research has found that a variety of community interventions can be effective in preventing a variety of psychological disorders (Price, Cowen, Lorion, & Ramos-McKay, 1988).

Data suggest that federally funded prevention programs such as the *Special Supplemental Program for Women, Infants, and Children (WIC)*, which provides federal grants to states for supplemental foods, health-care referral, and nutrition education for low-income women and their children, are successful. WIC mothers have higher birth weight babies and lower infant mortality than other low-income mothers (Ripple & Zigler, 2003). And the average blood-lead levels among children have fallen approximately 80% since the late 1970s as a result of federal legislation designed to remove lead paint from housing (Centers for Disease Control and Prevention, 2000)².

Although some of the many community-based programs designed to reduce alcohol, tobacco, and drug abuse; violence and delinquency; and mental illness have been successful, the changes brought about by even the best of these programs are, on average, modest (Wandersman & Florin, 2003; Wilson, Gottfredson, & Najaka, 2001). This does not necessarily mean that the programs are not useful. What is important is that community members continue to work with researchers to help determine which aspects of which programs

are most effective, and to concentrate efforts on the most productive approaches (Weissberg, Kumpfer, & Seligman, 2003). The most beneficial preventive interventions for young people involve coordinated, systemic efforts to enhance their social and emotional competence and health. Many psychologists continue to work to promote policies that support community prevention as a model of preventing disorder.

86.

REFERENCES

- Abrams, R. (1997). *Electroconvulsive therapy* (3rd ed.). Oxford, England: Oxford University Press.
- Ahn, H.-N., & Wampold, B. E. (2001). Where oh where are the specific ingredients? A meta-analysis of component studies in counseling and psychotherapy. *Journal of Counseling Psychology*, 48(3), 251–257.
- Alaimo, C. A. (2010, April 11). Psychiatric service dogs use senses to aid owners. *Arizona Daily Star*. Retrieved from http://azstarnet.com/news/local/article_d24b5799-9b31-548c-afec-c0160e45f49c.html.
- Allen K. W. (1996). Chronic nailbiting: A controlled comparison of competing response and mild aversion treatments. *Behaviour Research and Therapy*, 34, 269–272. doi:10.1016/0005-7967(95)00078-X.
- Baker, T. B., & Cannon, D. S. (1988). *Assessment and treatment of addictive disorders*. New York, NY: Praeger.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York, NY: New American Library.
- Beck, A. T., Freeman, A., & Davis, D. D. (2004). *Cognitive therapy of personality disorders* (2nd ed.). New York, NY: Guilford Press.
- Beck, J. S. (1995). *Cognitive therapy: Basics and beyond*. New York, NY: Guilford Press.
- Biedermann, F., & Fleischhacker, W. W. (2009). Antipsychotics in the early stage of development. *Current Opinion Psychiatry*, 22, 326–330.
- Busch, K. A., Fawcett, J., & Jacobs, D. G. (2003). Clinical correlates of inpatient suicide. *Journal of Clinical Psychiatry*, 64(1), 14–19.
- Butler A. C., Chapman, J. E., Forman, E. M., Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review*, 26(1), 17–31. doi:10.1016/j.cpr.2005.07.003.
- Cardeña, E., & Kirsch, I. (2000). True or false: The placebo effect as seen in drug studies is definitive proof that the mind can bring about clinically relevant changes in the body: What is so special about the placebo effect? *Advances in Mind-Body Medicine*, 16(1), 16–18.
- Casey, D. E. (1996). Side effect profiles of new antipsychotic agents. *Journal of Clinical Psychiatry*, 57(Suppl. 11), 40–45.
- Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology*, 66(1), 7–18.
- Corcoran, C. D., Thomas, P., Phillips, J., & O’Keane, V. (2006). Vagus nerve stimulation in chronic treatment-resistant depression: Preliminary findings of an open-label study. *The British Journal of Psychiatry*, 189, 282–283.

- Crits-Christoph, P. (1992). The efficacy of brief dynamic psychotherapy: A meta-analysis. *American Journal of Psychiatry*, 149, 151–158.
- Crits-Christoph, P., Gibbons, M. B., Losardo, D., Narducci, J., Schamberger, M., & Gallop, R. (2004). Who benefits from brief psychodynamic therapy for generalized anxiety disorder? *Canadian Journal of Psychoanalysis*, 12, 301–324.
- Cuijpers, P., van Straten, A., Andersson, G., & van Oppen, P. (2008). Psychotherapy for depression in adults: A meta-analysis of comparative outcome studies. *Journal of Consulting and Clinical Psychology*, 76(6), 909–922.
- Dagleish, T. (2004). Cognitive approaches to posttraumatic stress disorder: The evolution of multirepresentational theorizing. *Psychological Bulletin*, 130, 228–260.
- Deacon, B. J., & Abramowitz, J. S. (2004). Cognitive and behavioral treatments for anxiety disorders: A review of meta-analytic findings. *Journal of Clinical Psychology*, 60(4), 429–441.
- Deshauer, D., Moher, D., Fergusson, D., Moher, E., Sampson, M., & Grimshaw, J. (2008). Selective serotonin reuptake inhibitors for unipolar depression: A systematic review of classic long-term randomized controlled trials. *Canadian Medical Association Journal*, 178(10), 1293–301. doi:10.1503/cmaj.071068.
- Diav-Citrin, O., Shechtman, S., Ornoy, S., Arnon, J., Schaefer, C., Garbis, H.,...Ornoy, A. (2005). Safety of haloperidol and penfluridol in pregnancy: A multicenter, prospective, controlled study. *Journal of Clinical Psychiatry*, 66, 317–322.
- Dougherty, D., Baer, L., Cosgrove, G., Cassem, E., Price, B., Nierenberg, A.,...Rauch, S. L. (2002). Prospective long-term follow-up of 44 patients who received cingulotomy for treatment-refractory obsessive-compulsive disorder. *American Journal of Psychiatry*, 159(2), 269.
- Ellis, A. (2004). Why rational emotive behavior therapy is the most comprehensive and effective form of behavior therapy. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 22, 85–92.
- Epstein J., Stern E., & Silbersweig, D. (2001). Neuropsychiatry at the millennium: The potential for mind/brain integration through emerging interdisciplinary research strategies. *Clinical Neuroscience Research*, 1, 10–18.
- Fraser, A. R. (2000). Antidepressant choice to minimize treatment resistance. *The British Journal of Psychiatry*, 176, 493.
- Gonzales, L. R., Kelly, J. G., Mowbray, C. T., Hays, R. B., & Snowden, L. R. (1991). Community mental health. In M. Hersen, A. E. Kazdin, & A. S. Bellack (Eds.), *The clinical psychology handbook* (2nd ed., pp. 762–779). Elmsford, NY: Pergamon Press.
- Granholt, E., McQuaid, J. R., Link, P. C., Fish, S., Patterson, T., & Jeste, D. V. (2008). Neuropsychological predictors of functional outcome in cognitive behavioral social skills training for older people with schizophrenia. *Schizophrenia Research*, 100, 133–143. doi:10.1016/j.schres.2007.11.032.
- Greenhill, L. L., Halperin, J. M., & Abikof, H. (1999). Stimulant medications. *Journal of the American Academy of Child & Adolescent Psychiatry*, 38(5), 503–512.

- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, 74, 1464–1480.
- Healy, D., & Whitaker, C. J. (2003). Antidepressants and suicide: Risk-benefit conundrums. *Journal of Psychiatry & Neuroscience*, 28, 331–339.
- Herbert, J. D., Gaudiano, B. A., Rheingold, A. A., Myers, V. H., Dalrymple, K., & Nolan, E. M. (2005). Social skills training augments the effectiveness of cognitive behavioral group therapy for social anxiety disorder. *Behavior Therapy*, 36(2), 125–138.
- Hollon, S. D., Thase, M. E., & Markowitz, J. C. (2002). Treatment and prevention of depression. *Psychological Science in the Public Interest*, 3, 39–77.
- Hollon, S., Stewart, M., & Strunk, D. (2006). Enduring effects for cognitive therapy in the treatment of depression and anxiety. *Annual Review of Psychology*, 57, 285–316.
- Houts, A. C., Berman, J. S., & Abramson, H. (1994). Effectiveness of psychological and pharmacological treatments for nocturnal enuresis. *Journal of Consulting and Clinical Psychology*, 62(4), 737–745.
- Humphreys, K., & Rappaport, J. (1994). Researching self-help/mutual aid groups and organizations: Many roads, one journey. *Applied and Preventative Psychology*, 3(4), 217–231.
- Hunsley, J., & Di Giulio, G. (2002). Dodo bird, phoenix, or urban legend? The question of psychotherapy equivalence. *The Scientific Review of Mental Health Practice: Objective Investigations of Controversial and Unorthodox Claims in Clinical Psychology, Psychiatry, and Social Work*, 1(1), 11–22.
- Keller, M. B., Ryan, N. D., Strober, M., Klein, R. G., Kutcher, S. P., Birmaher, B.,...McCafferty, J. P. (2001). Efficacy of paroxetine in the treatment of adolescent major depression: A randomized, controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(7), 762–772.
- Kellner, C. H., Fink, M., Knapp, R., Petrides, G., Husain, M., Rummans, T.,...Malur, C. (2005). Relief of expressed suicidal intent by ECT: A consortium for research in ECT study. *The American Journal of Psychiatry*, 162(5), 977–982.
- Konnopka, A., Leichsenring, F., Leibing, E., & König, H.-H. (2009). Cost-of-illness studies and cost-effectiveness analyses in anxiety disorders: A systematic review. *Journal of Affective Disorders*, 114(1–3), 14–31.
- Kowatch, R. A., Suppes, T., Carmody, T. J., Bucci, J. P., Hume, J. H., Kromelis, M.,...Rush, A. J. (2000). Effect size of lithium, divalproex sodium, and carbamazepine in children and adolescents with bipolar disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39, 713–20.
- Krampe, H., Stawicki, S., Wagner, T., Bartels, C., Aust, C., Rütther, E.,...Ehrenreich, H. (2006). Follow-up of 180 alcoholic patients for up to 7 years after outpatient treatment: Impact of alcohol deterrents on outcome. *Alcoholism: Clinical and Experimental Research*, 30(1), 86–95.
- Leahy, R. L. (2003). *Cognitive therapy techniques: A practitioner's guide*. New York, NY: Guilford Press.
- Levenson, H. (2010). *Brief dynamic therapy*. Washington, DC: American Psychological Association.
- Lieberman, J., Stroup, T., McEvoy, J., Swartz, M., Rosenheck, R., Perkins, D.,...Lebowitz, B. D. (2005). Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. *New England Journal of Medicine*, 353(12), 1209.

- Linehan, M. M., & Dimeff, L. (2001). Dialectical behavior therapy in a nutshell. *The California Psychologist*, 34, 10–13.
- Loo, C. K., Schweitzer, I., & Pratt, C. (2006). Recent advances in optimizing electroconvulsive therapy. *Australian and New Zealand Journal of Psychiatry*, 40, 632–638.
- Louik, C., Lin, A. E., Werler M. M., Hernandez, S., & Mitchell, A. A. (2007). First-trimester use of selective serotonin-reuptake inhibitors and the risk of birth defects. *New England Journal of Medicine*, 356, 2675–2683.
- Lubarsky, L., & Barrett, M. S. (2006). The history and empirical status of key psychoanalytic concepts. *Annual Review of Clinical Psychology*, 2, 1–19.
- Marangell, L. B., Silver, J. M., Goff, D. C., & Yudofsky, S. C. (2003). Psychopharmacology and electroconvulsive therapy. In R. E. Hales & S. C. Yudofsky (Eds.), *The American Psychiatric Publishing textbook of clinical psychiatry* (4th ed., pp. 1047–1149). Arlington, VA: American Psychiatric Publishing.
- McBride, C., Farvolden, P., & Swallow, S. R. (2007). Major depressive disorder and cognitive schemas. In L. P. Riso, P. L. du Toit, D. J. Stein, & J. E. Young (Eds.), *Cognitive schemas and core beliefs in psychological problems: A scientist-practitioner guide* (pp. 11–39). Washington, DC: American Psychological Association.
- McDermut, W., Miller, I. W., & Brown, R. A. (2001). The efficacy of group psychotherapy for depression: A meta-analysis and review of the empirical research. *Clinical Psychology: Science and Practice*, 8(1), 98–116.
- McElroy, S. L., & Keck, P. E. (2000). Pharmacologic agents for the treatment of acute bipolar mania. *Biological Psychiatry*, 48, 539–557.
- Nemeroff, C., Mayberg, H., Kahl, S., McNamara, J., Frazer, A., Henry, T.,...Brannan, S. (2006). VNS therapy in treatment-resistant depression: Clinical evidence and putative neurobiological mechanisms. *Neuropsychopharmacology*, 31(7), 1345–1355.
- Newman, C. F., Leahy, R. L., Beck, A. T., Reilly-Harrington, N. A., & Gyulai, L. (2002). Clinical management of depression, hopelessness, and suicidality in patients with bipolar disorder. In C. F. Newman, R. L. Leahy, A. T. Beck, N. A. Reilly-Harrington, & L. Gyulai (Eds.), *Bipolar disorder: A cognitive therapy approach* (pp. 79–100). Washington, DC: American Psychological Association. doi:10.1037/10442-004.
- Nock, M. K., Park, J. M., Finn, C. T., Deliberto, T. L., Dour, H. J., & Banaji, M. R. (2010). Measuring the suicidal mind: Implicit cognition predicts suicidal behavior. *Psychological Science*, 21(4), 511–517.
- Odendaal, J. S. J. (2000). Animal-assisted therapy—Magic or medicine? *Journal of Psychosomatic Research*, 49(4), 275–280.
- Otto, M. W., Pollack, M. H., Sachs, G. S., Reiter, S. R., Meltzer-Brody, S., & Rosenbaum, J. F. (1993). Discontinuation of benzodiazepine treatment: Efficacy of cognitive-behavioral therapy for patients with panic disorder. *American Journal of Psychiatry*, 150, 1485–1490.
- Price, R. H., Cowen, E. L., Lorion, R. P., & Ramos-McKay, J. (Eds.). (1988). *Fourteen ounces of prevention: A casebook for practitioners*. Washington, DC: American Psychological Association.
- Prochaska, J. O., & Norcross, J. C. (2007). *Systems of psychotherapy: A transtheoretical analysis* (6th ed.). Pacific Grove, CA: Brooks/Cole.

- Rado, J., Dowd, S. M., & Janicak, P. G. (2008). The emerging role of transcranial magnetic stimulation (TMS) for treatment of psychiatric disorders. *Directions in Psychiatry*, 28(4), 315–332.
- Ripple, C. H., & Zigler, E. (2003). Research, policy, and the federal role in prevention initiatives for children. *American Psychologist*, 58(6–7), 482–490.
- Rogers, C. (1980). *A way of being*. New York, NY: Houghton Mifflin.
- Ruwaard, J., Broeksteeg, J., Schrieken, B., Emmelkamp, P., & Lange, A. (2010). Web-based therapist-assisted cognitive behavioral treatment of panic symptoms: A randomized controlled trial with a three-year follow-up. *Journal of Anxiety Disorders*, 24(4), 387–396.
- Sachdev, P. S., & Chen, X. (2009). Neurosurgical treatment of mood disorders: Traditional psychosurgery and the advent of deep brain stimulation. *Current Opinion in Psychiatry*, 22(1), 25–31.
- Sackeim, H. A., Prudic, J., Fuller, R., Keilp, J., Philip, W., Lavori, P. W., & Olfson, M. (2007). The cognitive effects of electroconvulsive therapy in community settings. *Neuropsychopharmacology*, 32, 244–254. doi:10.1038/sj.npp.1301180.
- Sackheim, H. A., Haskett, R. F., Mulsant, B. H., Thase, M. E., Mann, J. J., Pettinati, H.,...Prudic, J. (2001). Continuation pharmacotherapy in the prevention of relapse following electroconvulsive therapy: A randomized controlled trial. *Journal of the American Medical Association*, 285, 1299–1307.
- Scattone, D. (2007). Social skills interventions for children with autism. *Psychology in the schools*, 44, 717–726.
- Schwartz, A. N. (2008, March 16). Psychiatric service dogs, very special dogs, indeed. Dr. Schwartz's Weblog. Retrieved from http://www.mentalhelp.net/poc/view_doc.php?type=doc&id=14844.
- Shadish, W. R., & Baldwin, S. A. (2002). Meta-analysis of MFT interventions. In D. H. Sprenkle (Ed.), *Effectiveness research in marriage and family therapy* (pp. 339–370). Alexandria, VA: American Association for Marriage and Family Therapy.
- Shedler, J. (2010). The efficacy of psychodynamic psychotherapy. *American Psychologist*, 65(2), 98–109.
- Shim, J. (2008, January 29). Dogs chase nightmares of war away. CNN. Retrieved from <http://edition.cnn.com/2008/LIVING/personal/01/29/dogs.veterans>.
- Lorber, J. (2010, April 3). For the battle-scarred, comfort at leash's end. The New York Times. Retrieved from <http://www.nytimes.com/2010/04/04/us/04dogs.html>.
- Simon, G. E. (2006). The antidepressant quandary—Considering suicide risk when treating adolescent depression. *The New England Journal of Medicine*, 355, 2722–2723.
- Simon, G. E., Savarino, J., Operskalski, B., & Wang, P. S. (2006). Suicide risk during antidepressant treatment. *American Journal of Psychiatry*, 163, 41–47. doi:10.1176/appi.ajp.163.1.41.
- Smit, F., Cuijpers, P., Oostenbrink, J., Batelaan, N., de Graaf, R., & Beekman, A. (2006). Costs of nine common mental disorders: Implications for curative and preventive psychiatry. *Journal of Mental Health Policy and Economics*, 9(4), 193–200.
- Smith, M. L., Glass, G. V., & Miller, R. L. (1980). *The benefits of psychotherapy*. Baltimore, MD: Johns Hopkins University Press.

- Spencer, T. J., Biederman, J., Harding, M., & O'Donnell, D. (1996). Growth deficits in ADHD children revisited: Evidence for disorder-associated growth delays? *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(11), 1460–1469.
- Turner, E. H., Matthews, A. M., Linardatos, E., Tell, R. A., & Rosenthal, R. (2008). Selective publication of antidepressant trials and its influence on apparent efficacy. *New England Journal of Medicine*, 358(3), 252–60.
- Valenstein, E. (1986). *Great and desperate cures: The rise and decline of psychosurgery and other radical treatments for mental illness*. New York, NY: Basic Books.
- Wandersman, A., & Florin, P. (2003). Community interventions and effective prevention. *American Psychologist*, 58(6–7), 441–448.
- Weissberg, R. P., Kumpfer, K. L., & Seligman, M. E. P. (2003). Prevention that works for children and youth: An introduction. *American Psychologist*, 58(6–7), 425–432.
- Werner, E. E., & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. New York, NY: Cornell University Press.
- Wilson, D. B., Gottfredson, D. C., & Najaka, S. S. (2001). School-based prevention of problem behaviors: A meta-analysis. *Journal of Quantitative Criminology*, 17(3), 247–272.
- Wolpe J. (1973). *The practice of behavior therapy*. New York, NY: Pergamon.
- Yalom, I., & Leszcz, M. (2005). *The theory and practice of group psychotherapy* (5th ed.). New York, NY: Basic Books.
- Zahn, T. P., Rapoport, J. L., & Thompson, C. L. (1980). Autonomic and behavioral effects of dextroamphetamine and placebo in normal and hyperactive prepubertal boys. *Journal of Abnormal Child Psychology*, 8(2), 145–160.

APPENDIX A: CHECKLIST FOR ACCESSIBILITY

This title has been reviewed to meet these accessibility practices:

Organizing Content

- Content is organized under headings and subheadings.
- Headings and subheadings are used sequentially (e.g., Heading 1, Heading 2).

Images

- Images that convey information include alternative text (alt text) descriptions of the image's content or function.
- Graphs, charts, and maps also include contextual or supporting details in the text surrounding the image.
- Images do not rely on color to convey information.
- Images that are purely decorative do not have alt text descriptions. (Descriptive text is unnecessary if the image doesn't convey contextual content information).

Links

- The link text describes the destination of the link and does not use generic text such as "click here" or "read more."
- If a link will open or download a file (like a PDF or Excel file), a textual reference is included in the link information (e.g., [PDF]).
- Links do not open in new windows or tabs.
- If a link must open in a new window or tab, a textual reference is included in the link information (e.g., [NewTab]).
- For citations and references, the title of the resource is hyperlinked, and the full URL is not hyperlinked.

Tables

- Tables are used to structure information and not for layout.
- Tables include row and column headers.
- Row and column headers have the correct scope assigned.
- Tables include a caption.
- Tables avoid merged or split cells.
- Tables have adequate cell padding.

Multimedia

- All audio content includes a transcript. The transcript includes all speech content and relevant descriptions of non-speech audio and speaker names/headings where necessary.
- Videos have captions of all speech content and relevant non-speech content that has been edited by a human for accuracy.
- All videos with contextual visuals (graphs, charts, etc.) are described audibly in the video.

Formulas

- Equations written in plain text use proper symbols (i.e., $-$, \times , \div).¹
- For complex equations, one of the following is true:
 - They were written using LaTeX and are rendered with MathJax (Pressbooks).
 - They were written using Microsoft Word's equation editor.
 - They are presented as images with alternative text descriptions.
- Written equations are properly interpreted by text-to-speech tools.²

Font Size

- Font size is 12 point or higher for body text in Word and PDF documents.
- Font size is 9 point for footnotes or endnotes in Word and PDF documents.

1. For example, a hyphen (-) may look like a minus sign ($-$), but it will not be read out correctly by text-to-speech tools.

2. Written equations should prioritize semantic markup over visual markup so text-to-speech tools will read out an equation in a way that makes sense to auditory learners. This applies to both equations written in LaTeX and equations written in Microsoft Word's equation editor.

- Font size can be enlarged by 200 percent in webbook or ebook formats without needing to scroll side to side.

Learn more about [Pressbooks' commitment to Accessibility](#).

“Checklist for Accessibility” by BCcampus is licensed under [CC BY 4.0](#).

GLOSSARY

achievement gap

the persistent difference in grades, test scores, and graduation rates that exist among students of different ethnicities, races, and—in certain subjects—sexes

Adulthood

begins around 20 years old and has three distinct stages: early, middle, and late

Antidepressant medications

drugs designed to improve moods

attachment

the affectional bond or tie that an infant forms with the mother

Autism spectrum disorder

set of neurodevelopmental disorders characterized by repetitive behaviors and communication and social problems

autonomic nervous system

controls our internal organs and glands

autonomy

initiate tasks, and carry out plans. contributes to a positive sense of self.

avoidant attachment

the child is unresponsive to the parent, does not use the parent as a secure base, and does not care if the parent leaves

basolateral complex

dense connections with a variety of sensory areas of the brain

biopsychosocial model.

focuses on how health is affected by the interaction of biological, psychological, and sociocultural factors

blooming

period of rapid neural growth

case study

developmental psychologists collect a great deal of information from one individual in order to better understand physical and psychological changes over the lifespan

crystallized intelligence

information, skills, and strategies we have gathered through a lifetime of experience

cultural display rule

one of a collection of culturally specific standards that govern the types and frequencies of displays of emotions that are acceptable

developmental psychology

focuses on how people change, and keep in mind that all the approaches that we present in this chapter address questions of change

DNA

a helix-shaped molecule made up of nucleotide base pairs

embryonic stage

the heart begins to beat and organs form and begin to function

Erik Erikson (1902–1994)

stage theorist, took Freud's theory and modified it as psychosocial theory. Erikson's psychosocial development theory emphasizes the social nature of our development rather than its sexual nature

experimental research

allows developmental psychologists to make causal statements about certain variables that are important for the developmental process

Fetal alcohol spectrum disorders (FASD)

a collection of birth defects associated with heavy consumption of alcohol during pregnancy. Physically, children with FASD may have a small head size and abnormal facial features. Cognitively, these children may have poor judgment, poor impulse control, higher rates of ADHD, learning issues, and lower IQ scores

fetus

When the organism is about nine weeks old

fight or flight response

activation of the sympathetic division of the autonomic nervous system, allowing access to energy reserves and heightened sensory capacity so that we might fight off a given threat or run away to safety

five stages of grief

denial, anger, bargaining, depression, and acceptance

flashbulb memory

an exceptionally clear recollection of an important event

fluid intelligence

information processing abilities, reasoning, and memory

formal operational thought

highest level of cognitive development

four parenting styles

authoritative, authoritarian, permissive, and uninvolved

G. Stanley Hall

a pioneer in the study of adolescent development

genetic environmental correlation

view of gene-environment interaction that asserts our genes affect our environment, and our environment influences the expression of our genes

germinal stage

the mass of cells has yet to attach itself to the lining of the mother's uterus

glial cells

cells that surround and link to the neurons, protecting them, providing them with nutrients, and absorbing unused neurotransmitters

heterozygous

consisting of two different alleles

hospice

is to help provide a death with dignity and pain management in a humane and comfortable environment, which is usually outside of a hospital setting

identical twins

twins that develop from the same sperm and egg

James-Lange theory of emotion

asserts that emotions arise from physiological arousal

Jean Piaget (1896–1980)

another stage theorist who studied childhood development

Lawrence Kohlberg (1927–1987)

believed that moral development, like cognitive development, follows a series of stages

Learning disabilities

cognitive disorders that affect different areas of cognition, particularly language or reading

lifespan development

from the start of life to the end

menopause

the end of the menstrual cycle, around 50 years old

Middle adulthood

extends from the 40s to the 60s

Mnemonic devices

memory aids that help us organize information for encoding

nature versus nurture debate

It seeks to understand how our personalities and traits are the product of our genetic makeup and biological factors, and how they are shaped by our environment, including our parents, peers, and culture

neurotransmitters

chemical messenger of the nervous system

parent-child attachments

secure, avoidant, and resistant

peripheral nervous system

connects the brain and spinal cord to the muscles, organs, and senses in the periphery of the body

permissive style of parenting

the kids run the show and anything goes. Permissive parents make few demands and rarely use punishment

polygenic

multiple genes affecting a given trait

Psychosocial development

occurs as children form relationships, interact with others, and understand and manage their feelings

psychosocial theory

we experience eight stages of development over our lifespan, from infancy through late adulthood

Recall

what we most often think about when we talk about memory retrieval: it means you can access information without cues

receptors

protein on the cell surface where neurotransmitters attach

recessive allele

allele whose phenotype will be expressed only if an individual is homozygous for that allele

self-serving bias

attributions that enable us to see ourselves in favorable light

sensorimotor stage

a stage of development which lasts from birth to about 2 years old. During this stage, children learn about the world through their senses and motor behavior

Sigmund Freud (1856–1939)

believed that personality develops during early childhood. For Freud, childhood experiences shape our personalities and behavior as adults. Freud viewed development as discontinuous; he believed that each of us must pass through a series of stages during childhood, and that if we lack proper nurturance and parenting during a stage, we may become stuck, or fixated, in that stage.

somatic nervous system

transmits sensory and motor signals to and from the central nervous system

stranger anxiety

a fear of unfamiliar people

survey method

asks individuals to self-report important information about their thoughts, experiences, and beliefs

synapses

spaces between the cells

uninvolved style of parenting

the parents are indifferent, uninvolved, and sometimes referred to as neglectful. They don't respond to the child's needs and make relatively few demands

absentmindedness

lapses in memory are caused by breaks in attention or our focus being somewhere else

Accommodation

describes when they change their schemata based on new information

acoustic encoding

encoding of sounds, words in particular

action potential

change in electrical charge that occurs in a neuron when a nerve impulse is transmitted

actor-observer bias

the phenomenon of attributing other people's behavior to internal factors (fundamental attribution error) while attributing our own behavior to situational forces

Adolescence

the period of development that begins at puberty and ends at emerging adulthood

adrenarche and gonadarche

the maturing of the adrenal glands and sex glands, respectively

ageism

prejudice and discrimination toward individuals based solely on their age

Aggression

behavior that is intended to harm another individual

agonist

a drug that has chemical properties similar to a particular neurotransmitter and thus mimics the effects of the neurotransmitter

allele

a specific version of a gene

Altruism

any behavior that is designed to increase another person's welfare, and particularly those actions that do not seem to provide a direct reward to the person who performs them

American Psychological Association

a professional organization representing psychologists in the United States

Amnesia

the loss of long-term memory that occurs as the result of disease, physical trauma, or psychological trauma

amygdala

consists of two "almond-shaped" clusters (amygdala comes from the Latin word for "almond") and is primarily responsible for regulating our perceptions of, and reactions to, aggression and fear

Anorexia nervosa

eating disorder characterized by the maintenance of a body weight well below average through starvation and/or excessive exercise

antagonist

a drug that reduces or stops the normal effects of a neurotransmitter

anterograde amnesia

you cannot remember new information, although you can remember information and events that happened prior to your injury

Antianxiety medications

drugs that help relieve fear or anxiety

Antipsychotic drugs (neuroleptics)

drugs that treat the symptoms of schizophrenia and related psychotic disorders

archival research

method of research using past records or data sets to answer various research questions, or to search for interesting patterns or relationships

arousal theory

strong emotions trigger the formation of strong memories, and weaker emotional experiences form weaker memories

Asch effect

the influence of the group majority on an individual's judgment

assimilation

when they take in information that is comparable to what they already know

association areas

which sensory and motor information is combined and associated with our stored knowledge

Atkinson-Shiffrin (A-S)

based on the belief that we process memories in the same way that a computer processes information

Attitude

our evaluation of a person, an idea, or an object

auditory cortex

responsible for hearing and language

authoritarian style

the parent places high value on conformity and obedience. The parents are often strict, tightly monitor their children, and express little warmth

authoritative style

the parent gives reasonable demands and consistent limits, expresses warmth and affection, and listens to the child's point of view

automatic processing

encoding of details like time, space, frequency, and the meaning of words

Aversion therapy

a type of behavior therapy in which positive punishment is used to reduce the frequency of an undesirable behavior.

axon

transmits information away from the cell body toward other neurons or to the muscles and glands

Bariatric surgery

type of surgery specifically aimed at weight reduction, and it involves modifying the gastrointestinal system to reduce the amount of food that can be eaten and/or limiting how much of the digested food can be absorbed

Barnum effect

the observation that people tend to believe in descriptions of their personality that supposedly are descriptive of them but could in fact describe almost anyone

Behavioral therapy

psychological treatment that is based on principles of learning

behaviorism

approach of observing and controlling behavior

bias

your feelings and view of the world can actually distort your memory of past events

Binge eating disorder

eating binges are not followed by inappropriate behavior, such as purging, but they are followed by distress, including feelings of guilt and embarrassment

Biological rhythms

internal rhythms of biological activity

Biomedical therapies

treatments designed to reduce psychological disorder by influencing the action of the central nervous system.

biopsychology

explores how our biology influences our behavior

Body language

the expression of emotion in terms of body position or movement

brain lateralization

idea that the left and the right hemispheres of the brain are specialized to perform different functions

brain stem

the oldest and innermost region of the brain

bulimia nervosa

engage in binge eating behavior that is followed by an attempt to compensate for a large amount of food consumed

Caffeine

another stimulant drug

Cannon-Bard theory

maintains that emotional experience occurs simultaneous to and independent of physiological arousal

categories

networks of associated memories that have features in common with each other

central nervous system

brain and spinal cord

central nucleus

plays a role in attention, and it has connections with the hypothalamus and various brainstem areas to regulate the autonomic nervous and endocrine systems' activity

cerebellum

consists of two wrinkled ovals behind the brain stem

cerebral cortex

the outer bark-like layer of our brain that allows us to so successfully use language, acquire complex skills, create tools, and live in social groups

Charismatic leaders

leaders who are enthusiastic, committed, and self-confident; who tend to talk about the importance of group goals at a broad level; and who make personal sacrifices for the group

Chromosomes

long strings of genetic material known as deoxyribonucleic acid (DNA)

chunking

organize information into manageable bits or chunks

circadian rhythm

a biological rhythm that takes place over a period of about 24 hours

cognition

thinking, and it encompasses the processes associated with perception, knowledge, problem-solving, judgment, language, and memory

Cognitive development

involves learning, attention, memory, language, thinking, reasoning, and creativity

cognitive dissonance

psychological discomfort arising from holding two or more inconsistent attitudes, behaviors, or cognitions

Cognitive empathy

theory-of-mind, relates to the ability to take the perspective of others and feel concern for others

Cognitive psychology

concerned with the relationship that exists between thought and behavior, and developmental psychologists study the physical and cognitive changes that occur throughout one's lifespan

cognitive therapy

a psychological treatment that helps clients identify incorrect or distorted beliefs that are contributing to disorder

Cognitive-behavior therapy (CBT)

a structured approach to treatment that attempts to reduce psychological disorders through systematic procedures based on cognitive and behavioral principles

cognitive-mediational theory

asserts our emotions are determined by our appraisal of the stimulus

collective unconscious

a collection of shared ancestral memories

Community mental health services

psychological treatments and interventions that are distributed at the community level.

components of emotion

Our emotional states are combinations of physiological arousal, psychological appraisal, and subjective experiences

Conception

occurs when sperm fertilizes an egg and forms a zygote

concrete operational stage

occurs from about 7 to 11 years old. In this stage, children can think logically about real (concrete) events; they have a firm grasp on the use of numbers and start to employ memory strategies

confirmation bias

process where we seek out information that supports stereotypes and ignore information that is inconsistent with our stereotypes

Consciousness

our awareness of internal and external stimuli

construction

The formulation of new memories

Continuous development

views development as a cumulative process, gradually improving on existing skills

corpus callosum

the region that normally connects the two halves of the brain and supports communication between the hemispheres

Counseling psychology

a similar discipline that focuses on emotional, social, vocational, and health-related outcomes in individuals who are considered psychologically healthy.

Declarative memory

has to do with the storage of facts and events we personally experienced.

defense mechanisms

unconscious psychological strategies used to cope with anxiety and to maintain a positive self-image

dendrite

collects information from other cells and sends the information to the soma

depressant

a drug that tends to suppress central nervous system activity.

developmental psychologists

try to answer, by studying how humans change and grow from conception through childhood, adolescence, adulthood, and death

Developmental psychology

the scientific study of development across a lifespan

discontinuous (development)

development takes place in unique stages: It occurs at specific times or ages.

disorganized attachment

children tend to show clingy behavior, but then they reject the attachment figure's attempts to interact with them

distorted body image

type of body dysmorphia, meaning that they view themselves as overweight even though they are not

dominant allele

an allele whose phenotype will be expressed in an individual that possesses that allele

dream analysis

analyze the symbolism of the dreams in an effort to probe the unconscious thoughts of the client and interpret their significance

drive theory of motivation

deviations from homeostasis create physiological needs

Drug withdrawal

a variety of negative symptoms experienced when drug use is discontinued

eclectic therapy

an approach to treatment in which the therapist uses whichever techniques seem most useful and relevant for a given patient

effortful processing

required a lot of work and attention on your part in order to encode that information

ego

the largely conscious controller or decision-maker of personality

Elaborative rehearsal

a technique in which you think about the meaning of the new information and its relation to knowledge already stored in your memory

Electroconvulsive therapy (ECT)

a medical procedure designed to alleviate psychological disorder in which electric currents are passed through the brain, deliberately triggering a brief seizure

emerging adulthood

relatively newly defined period of lifespan development spanning from 18 years old to the mid-20s, characterized as an in-between time where identity exploration is focused on work and love

emotion

a subjective state of being that we often describe as our feelings

empirical method

acquiring knowledge is one based on observation, including experimentation, rather than a method based only on forms of logical argument or previous authorities

encoding

the input of information into the memory system

engram

the group of neurons that serve as the “physical representation of memory”

epigenetics

study of gene-environment interactions, such as how the same genotype leads to different phenotypes

Episodic memory

information about events we have personally experienced

equipotentiality hypothesis

if part of one area of the brain involved in memory is damaged, another part of the same area can take over that memory function

Explicit memories

those we consciously try to remember and recall

Exposure therapy

a behavioral therapy based on the classical conditioning principle of extinction, in which people are confronted with a feared stimulus with the goal of decreasing their negative emotional responses to it

facial feedback hypothesis

suggested that suppression of facial expression of emotion lowered the intensity of some emotions experienced by participants

false memory syndrome

Recall of false autobiographical memories

fetal alcohol spectrum disorder (FASD) or fetal alcohol syndrome (FAS)

a cluster of birth defects and symptoms

Fine motor skills

focus on the muscles in our fingers, toes, and eyes, and enable coordination of small actions (e.g., grasping a toy, writing with a pencil, and using a spoon)

Five-Factor (Big Five) Model of Personality

five fundamental underlying trait dimensions that are stable across time, cross-culturally shared, and explain a substantial proportion of behavior

Forensic psychology

branch of psychology that deals with questions of psychology as they arise in the context of the justice system

Forgetting

refers to the loss of information from long-term memory

formal operational stage

from about age 11 to adulthood. Children in this stage can use abstract thinking to problem solve, look at alternative solutions, and test these solutions. In adolescence, a renewed egocentrism occurs.

fraternal twins

twins who develop from two different eggs fertilized by different sperm, so their genetic material varies the same as in non-twin siblings

free association

therapist listens while the client talks about whatever comes to mind, without any censorship or filtering

frontal lobe

responsible primarily for thinking, planning, memory, and judgment

Functionalism

focuses on how mental activities help an organism fit into its environment.

Gender dysphoria

diagnostic category in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) that describes individuals who do not identify as the gender that most people would assume they are

genes

sequence of DNA that controls or partially controls physical characteristics

genotype

the genetic makeup of that individual

Gross motor skills

focus on large muscle groups that control our arms and legs and involve larger movements (e.g., balancing, running, and jumping)

Group polarization

the strengthening of an original group attitude after the discussion of views within a group

Group therapy

psychotherapy in which clients receive psychological treatment together with others

Groupthink

the modification of the opinions of members of a group to align with what they believe is the group consensus

habit

a pattern of behavior in which we regularly engage

hallucinogen

one of a class of drugs that results in profound alterations in sensory and perceptual experiences

hierarchy of needs

theory of motivation that spans the spectrum of motives ranging from the biological to the individual to the social.

hippocampus

consists of two “horns” that curve back from the amygdala

Homeostasis

the tendency to maintain a balance, or optimal level, within a biological system

homophobia

prejudice and discrimination of individuals based solely on their sexual orientation

Humanism

a perspective within psychology that emphasizes the potential for good that is innate to all humans.

humanistic therapy

a psychological treatment based on the personality theories of Carl Rogers and other humanistic psychologists

Hypnosis

a state of extreme self-focus and attention in which minimal attention is given to external stimuli

hypothalamus

which lies above the pituitary gland, is a main center of homeostasis

id

the component of personality that forms the basis of our most primitive impulses

Implicit memories

memories that are not part of our consciousness

in-group

a group that we identify with or see ourselves as belonging to

insight

an understanding of the unconscious causes of the disorder

instinct

a species-specific pattern of behavior that is not learned

interpretation

allowing the therapist to try to understand the underlying unconscious problems that are causing the symptoms

just-world hypothesis

the belief that people get the outcomes they deserve

Language

a communication system that involves using words and systematic rules to organize those words to transmit information from one individual to another

leadership

the ability to direct or inspire others to achieve goals

leptin

a satiety hormone

levels of processing

If we want to remember a piece of information, we should think about it more deeply and link it to other information and memories to make it more meaningful.

limbic system

brain area, located between the brain stem and the two cerebral hemispheres, that governs emotion and memory. It includes the amygdala, the hypothalamus, and the hippocampus.

Long-term memory (LTM)

the continuous storage of information

Meditation

act of focusing on a single target (such as the breath or a repeated sound) to increase awareness of the moment

medulla

the area of the brain stem that controls heart rate and breathing

Memory

the set of processes used to encode, store, and retrieve information over different periods of time.

memory consolidation

the step of rehearsal, the conscious repetition of information to be remembered, to move STM into long-term memory

memory-enhancing strategies

help make sure information goes from short-term memory to long-term memory

menarche

the beginning of menstrual periods, usually around 12–13 years old

meta-analysis

a statistical technique that uses the results of existing studies to integrate and draw conclusions about those studies

metabolic rate

the amount of energy that is expended in a given period of time

Methamphetamine

a type of amphetamine that can be made from ingredients that are readily available

Minnesota Multiphasic Personality Inventory (MMPI)

a test used around the world to identify personality and psychological disorders

Misattribution

happens when you confuse the source of your information

misinformation effect paradigm

holds that after exposure to incorrect information, a person may misremember the original event

mitosis

process of cell division

Morbid obesity

having a BMI over 40

Motivation

describes the wants or needs that direct behavior toward a goal

motor cortex

the part of the cortex that controls and executes movements of the body by sending signals to the cerebellum and the spinal cord.

Motor skills

refer to our ability to move our bodies and manipulate objects

mutation

sudden, permanent change in a gene

myelin sheath

a layer of fatty tissue surrounding the axon of a neuron that both acts as an insulator and allows faster transmission of the electrical signal.

Naturalistic observations

observing behavior in its natural context

nature

biology and genetics

neo-Freudian

The neo-Freudian theories are theories based on Freudian principles that emphasize the role of the unconscious and early experience in shaping personality but place less evidence on sexuality as the primary motivating force in personality and are more optimistic concerning the prospects for personality growth and change in personality in adults.

neurogenesis

the forming of new neurons

neuron

cell in the nervous system whose function is to receive and transmit information

Neuroplasticity

the brain's ability to change its structure and function in response to experience or damage

neurotransmitter

a chemical that relays signals across the synapses between neurons.

node of Ranvier

a series of breaks between the sausage-like segments of the myelin sheath

normative approach

asks, “What is normal development?”

nurture

our environment and culture

Obedience

the change of an individual’s behavior to comply with a demand by an authority figure

obese

When someone weighs more than what is generally accepted as healthy for a given height

object permanence

the understanding that even if something is out of sight, it still exists

objective

free from the personal bias or emotions of the scientist

occipital lobe

at the very back of the skull, which processes visual information.

opioid

one of a category of drugs that includes heroin, morphine, methadone, and codeine

out-group

a group that we view as fundamentally different from us

outcome research

studies that assess the effectiveness of medical treatments, to determine the effectiveness of different therapies

overweight

an adult with a body mass index (BMI) between 25 and 29.9

paradoxical sleep

combination of high brain activity and lack of muscle tone

parasympathetic nervous system

associated with returning the body to routine, day-to-day operations

parietal lobe

which extends from the middle to the back of the skull and which is responsible primarily for processing information about touch

person-centered therapy (or client-centered therapy)

an approach to treatment in which the client is helped to grow and develop as the therapist provides a comfortable, nonjudgmental environment

Personality

long-standing traits and patterns that propel individuals to consistently think, feel, and behave in specific ways

Personality psychology

focuses on patterns of thoughts and behaviors that make each individual unique

Personality traits

relatively consistent patterns of thought and behavior

Persuasion

the process of changing our attitude toward something based on some kind of communication

Phenotype

refers to the individual's inherited physical characteristics, which are a combination of genetic and environmental influences

Physical dependence

changes in normal bodily functions—the user will experience withdrawal from the drug upon cessation of use

Physical development

involves growth and changes in the body and brain, the senses, motor skills, and health and wellness

placenta

a structure connected to the uterus that provides nourishment and oxygen from the mother to the developing embryo via the umbilical cord

polygraph

lie detector test, measures the physiological arousal of an individual responding to a series of questions

pons

a structure in the brain stem that helps control the movements of the body, playing a particularly important role in balance and walking

preoperational stage

from approximately 2 to 7 years old. In this stage, children can use symbols to represent words, images, and ideas, which is why children in this stage engage in pretend play

Primary sexual characteristics

are organs specifically needed for reproduction, like the uterus and ovaries in females and testes in males

proactive interference

when old information hinders the recall of newly learned information

Procedural memory

type of implicit memory: it stores information about how to do things

Projective measures

measures of personality in which unstructured stimuli, such as inkblots, drawings of social situations, or incomplete sentences, are shown to participants, who are asked to freely list what comes to mind as they think about the stimuli

prototype

the member of the category that is most average or typical of the category

Psychoanalytic theory

focuses on the role of a person's unconscious, as well as early childhood experiences

Psychodynamic therapy (psychoanalysis)

psychological treatment based on Freudian and neo-Freudian personality theories in which the therapist helps the patient explore the unconscious dynamics of personality

psychological assessment

an evaluation of the patient's psychological and mental health

psychological dependence

an emotional, rather than physical, need for the drug and may use the drug to relieve psychological distress

psychological disorder

a condition characterized by abnormal thoughts, feelings, and behaviors

Psychology

the scientific study of mind and behavior

Psychosocial development

involves emotions, personality, and social relationships

Psychosurgery

surgery that removes or destroys brain tissue in the hope of improving disorder

psychotherapy

the professional treatment for psychological disorder through techniques designed to encourage communication of conflicts and insight

Racism

prejudice and discrimination against an individual based solely on one's membership in a specific racial group

Range of reaction

asserts that our genes set the boundaries within which we can operate, and our environment interacts with the genes to determine where in that range we will fall

Rapid eye movement (REM) sleep

characterized by darting movements of the eyes under closed eyelids

reconstruction

the process of bringing up old memories

relapse

repeated drug use and/or alcohol use after a period of improvement from substance abuse

relearning

It involves learning information that you previously learned

resistance

using defense mechanisms to avoid the painful feelings in his or her unconscious

resistant attachment

children tend to show clingy behavior, but then they reject the attachment figure's attempts to interact with them

resting potential

a state in which the interior of the neuron contains a greater number of negatively charged ions than does the area outside the cell

reticular formation

Running through the medulla and the pons is a long, narrow network of neurons

retrieval

the act of getting information out of storage and into conscious awareness through recall, recognition, and relearning

Retroactive interference

happens when information learned more recently hinders the recall of older information

retrograde amnesia

Memory problems that extend back in time before the injury and prevent retrieval of information previously stored in long-term memory

reuptake

a process in which neurotransmitters that are in the synapse are reabsorbed into the transmitting terminal buttons, ready to again be released after the neuron fires

Risk factors

the social, environmental, and economic vulnerabilities that make it more likely than average that a given individual will develop a disorder

Rorschach Inkblot Test

a projective measure of personality in which the respondent indicates his or her thoughts about a series of 10 symmetrical inkblots

Schachter-Singer two-factor theory

suggests that physiological arousal receives cognitive labels as a function of the relevant context and that these two factors together result in an emotional experience

Schachter-Singer two-factor theory of emotion

emotions are composed of two factors: physiological and cognitive

schema

a mental construct consisting of a cluster or collection of related concepts

schemas

patterns of knowledge in long-term memory that help us organize information

Schemata

are concepts (mental models) that are used to help us categorize and interpret information

scientific method

the set of assumptions, rules, and procedures scientists use to conduct research

scientific theory

broad explanation or group of explanations for some aspect of the natural world that is consistently supported by evidence over time

script

a person's knowledge about the sequence of events expected in a specific setting

Secondary sexual characteristics

are physical signs of sexual maturation that do not directly involve sex organs, such as development of breasts and hips in girls, and development of facial hair and a deepened voice in boys

secure attachment

the toddler prefers his parent over a stranger

self-actualization

the motivation to develop our innate potential to the fullest possible extent

self-concept

the set of beliefs about who we are

Self-efficacy

an individual's belief in her own capability to complete a task

self-esteem

our positive feelings about the self

self-fulfilling prophecy

an expectation held by a person that alters his or her behavior in a way that tends to make it true

self-help group

a voluntary association of people who share a common desire to overcome psychological disorder or improve their well-being

self-reference effect

the tendency for an individual to have better memory for information that relates to oneself in comparison to material that has less personal relevance

semantic encoding

The encoding of words and their meaning

sensory memory

storage of brief sensory events, such as sights, sounds, and tastes

Sensory receptors

specialized neurons that respond to specific types of stimuli

Sexism

prejudice and discrimination toward individuals based on their sex

sexual orientation

their emotional and erotic attraction toward another individual

Short-term memory (STM)

temporary storage system that processes incoming sensory memory; sometimes it is called working memory

Social facilitation

occurs when an individual performs better when an audience is watching than when the individual performs the behavior alone

Social loafing

the exertion of less effort by a person working together with a group

social norm

a group's expectation of what is appropriate and acceptable behavior for its members

Social psychology

examines how people affect one another, and it looks at the power of the situation

social role

a pattern of behavior that is expected of a person in a given setting or group

soma

contains the nucleus of the cell and keeps the cell alive

somatosensory cortex

an area just behind and parallel to the motor cortex at the back of the frontal lobe, receives information from the skin's sensory receptors and the movements of different body parts.

spermarche

the first ejaculation, around 13–14 years old

sport and exercise psychology

study the psychological aspects of sport performance, including motivation and performance anxiety, and the effects of sport on mental and emotional wellbeing

Stimulants

drugs that tend to increase overall levels of neural activity

Storage

the creation of a permanent record of information

Suggestibility

describes the effects of misinformation from external sources that leads to the creation of false memories

superego

our sense of morality and thoughts

sympathetic nervous system

involved in preparing the body for stress-related activities

synapses

areas where the terminal buttons at the end of the axon of one neuron nearly, but don't quite, touch the dendrites of another.

Systematic desensitization

a behavioral treatment that combines imagining or experiencing the feared object or situation with relaxation exercises

Temperament

refers to innate traits that influence how one thinks, behaves, and reacts with the environment

temporal lobe

responsible primarily for hearing and language

teratogen

any environmental agent—biological, chemical, or physical—that causes damage to the developing embryo or fetus

Terminal buttons

axon terminal containing synaptic vesicles

thalamus

the egg-shaped structure above the brain stem that applies still more filtering to the sensory information that is coming up from the spinal cord and through the reticular formation, and it relays some of these remaining signals to the higher brain levels

Thematic Apperception Test (TAT)

a projective measure of personality in which the respondent is asked to create stories about sketches of ambiguous situations, most of them of people, either alone or with others

theory of evolution by natural selection

the theory states that organisms that are better suited for their environment will survive and reproduce, while those that are poorly suited for their environment will die off

therapeutic alliance

a relationship between the client and the therapist that is facilitated when the therapist is genuine (i.e., he or she creates no barriers to free-flowing thoughts and feelings), when the therapist treats the client with unconditional positive regard (i.e., values the client without any qualifications, displaying an accepting attitude toward whatever the client is feeling at the moment), and when the therapist develops empathy with the client (i.e., that he or she actively listens to and accurately perceives the personal feelings that the client experiences)

threshold of excitation

level of charge in the membrane that causes the neuron to become active

Tolerance

linked to physiological dependence, and it occurs when a person requires more and more drug to achieve effects previously experienced at lower doses

traits

relatively enduring characteristics that influence our behavior across many situations

transcranial magnetic stimulation (TMS)

a medical procedure designed to reduce psychological disorder that uses a pulsing magnetic coil to electrically stimulate the brain

transference

the patient unconsciously redirects feelings experienced in an important personal relationship toward the therapist

transgender hormone therapy

an attempt to make their bodies look more like the opposite sex

transience

memories can fade over time

unconditional positive regard

a set of behaviors including being genuine, open to experience, transparent, able to listen to others, and self-disclosing and empathic

visual cortex

area located in the occipital lobe (at the very back of the brain) that processes visual information

Visual encoding

encoding of images

Wakefulness

characterized by high levels of sensory awareness, thought, and behavior

Yerkes-Dodson law

holds that a simple task is performed best when arousal levels are relatively high and complex tasks are best performed when arousal levels are lower

zygote

begins as a one-cell structure that is created when a sperm and egg merge