

ESSENTIALS *of* Psychology

SEVENTH EDITION

DOUGLAS A. BERNSTEIN

ESSENTIALS OF PSYCHOLOGY

SEVENTH EDITION

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For Doris

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Preface

Psychology is a rich and varied science, covering the breadth and depth of human behavior—everything from fleeting reflexes to enduring memories, from falling asleep to falling in love. In my experience, most students enter the introductory course thinking that psychology concerns itself mainly with personality, psychological testing, mental disorders, psychotherapy, and other aspects of clinical psychology. Many of these students are surprised to find themselves reading about such topics as the structure of the brain, optical illusions, effect of jet lag on athletic performance, AIDS and the immune system, and prenatal risk factors, to name just a few. Yet all these topics can be found under the umbrella of psychology.

For all its diversity, psychology is also a remarkably integrated discipline whose subfields are linked through common interests and related research questions. As a psychologist and scholar, I wrote this book to portray the wide range of topics that make up the science of psychology. As a teacher, I focused on the essentials of the discipline—the core concepts in psychology that I hope will be especially accessible and interesting to students. I also tried to present these topics through an integrated, active pedagogical system designed to help students get the most out of the text.

In creating the seventh edition of *Essentials of Psychology*, I remained dedicated to presenting a textbook that not only is clear and enjoyable to read but also provides features to support the learning process in all students, regardless of their academic background. Specifically, I set these goals:

- To focus on topics that represent the full range of psychology, from cell to society, without overwhelming the reader with details.
- To provide many active learning exercises that invite students to work with the book's material in ways that can help them understand and remember it.
- To help students develop their ability to think critically and scientifically by examining the ways that psychological scientists have solved (or tried to solve) fascinating puzzles of behavior and mental processes.
- To explain the content of psychology with an emphasis on the doing of psychology, grounding all discussions in current and classic research studies. (I help students appreciate the importance of research by exploring one study in detail in a special feature in each chapter.)

My discussion of research in psychology is also designed to remind students that although, in some ways, “people are people wherever you go,” sociocultural factors—including

gender, ethnicity, cultural background, and geography—often shape human behavior and mental processes. I repeatedly point out, therefore, that psychological research on the thinking styles, perceptual habits, psychological disorders, social pressures, and other phenomena seen in North America or Europe, for example, may or may not apply to other cultures, or even to subcultures within Western countries.

Rather than isolating discussion of sociocultural material in boxed features, I have woven it into every chapter so that students will encounter it repeatedly as they read. I introduce the importance of sociocultural factors in Chapter 1 and continue to reinforce it through coverage of such topics as the impact of culture and experience on perception (Chapter 3); classrooms across cultures (Chapter 5); ethnic differences in IQ (Chapter 7); social and cultural factors in sexuality (Chapter 8); gender differences in stress responses (Chapter 10); personality, culture, and human development (Chapter 11); gender and cultural differences in depression and suicide (Chapter 12); and cultural factors in aggression (Chapter 14), to cite just a few examples.

What's New in This Edition?

Feedback from faculty colleagues and students suggests that the changes made in the sixth edition of *Essentials* were well received. Accordingly, in creating the seventh edition, I have sought to update and upgrade all the book's best features rather than change them for the sake of change. I hope that the result of my effort is a book that offers even more of what faculty and students want and need.

Organization

Designed for presentation in a single academic term, the book's chapter organization has been retained, and the chapters appear in the same sequence as before. The order of the chapters reflects the way I have taught my introductory course, but I know that your preference for chapter sequencing may not match mine. Accordingly I have again ensured that each of the sixteen chapters works as a freestanding unit so that you may assign the chapters in whatever order you wish. For example, many instructors prefer to teach the material on human development relatively late in the course, which is why it appears as Chapter 9. However, the chapter can be just as comfortably assigned earlier in the course.

A Continued Emphasis on Active Learning

TRY THIS The added emphasis on active learning in the third edition was so popular with faculty and students that I have continued to emphasize it ever since. Previously called Learn by Doing, I now invite students to Try This! Three kinds of “Try This” features appear throughout the book.

- First, dozens of new or revised figure and photo captions help students understand and remember a psychological principle or phenomenon by suggesting ways they can demonstrate it for themselves. In the memory chapter, for example, a photo caption suggests that students show the photo to a friend and then ask questions about it to illustrate the operation of constructive memory. These captions are all identified with a Try This logo.
- Second, I have placed Try This logos in page margins at even more places where active learning opportunities occur in the narrative. At these points, I ask students to stop reading and try doing something to illustrate or highlight the psychological principle or phenomenon under discussion. For example, in the sensation and perception chapter, I ask students to focus attention on various targets as a way of appreciating the difference between overt and covert attention shifts.

Active Review

The Try This elements are just part of my effort to incorporate active learning throughout the book. In addition, I have provided the following:

- A “Linkages” diagram to help students understand and appreciate the ways the chapter they have just read relates to other subfields of psychology.
- Twenty-item multiple-choice self-tests at the end of each chapter to help students plan their study strategies by recognizing what they have learned, and what they have not yet learned, from their reading of the chapter. As in the sixth edition, these self-tests are focused on the applications as well as the definitions of principles, concepts, and phenomena.

Updated Content

My goal in preparing this new edition of *Essentials* was to present the latest as well as the most established results of basic and applied research on topics that are both important to psychology and of high interest to students. Following is a chapter-by-chapter summary of new and updated material included in the seventh edition:

Chapter 1:

- Latest figures on employment settings for psychologists
- Latest figures on graduate degrees in psychology earned by men, women, and members of minority groups

- Latest research methods used to evaluate claims for the effectiveness of eye movement desensitization and reprocessing (EMDR) therapy
- New information on epigenetic influences in understanding the interacting roles of heredity and environment

Chapter 2:

- Updated research on stem cells and nerve growth factors and their uses in repairing brain damage
- Latest information on techniques for studying the brain, including commercial and forensic uses
- Latest information on electrical synapses
- Latest information on the use of electrical stimulation as therapy for brain damage
- Information about how experience can change the structure of the brain
- Latest information about adolescent brain development and behavior
- Latest information on optogenetics

Chapter 3:

- New information about age-related decreases in visual acuity
- New Try This exercise to help illustrate the trichromatic theory of color vision
- New information about loss of olfaction as an early indicator of neurological disorder
- Latest information about research on pheromones in humans
- Latest information about research on acupuncture
- New information about benign paroxysmal positional vertigo
- New information about the sense of equilibrium and astronautics
- Expanded information about the effects of motivation on top-down processing
- Updated and expanded information about the effects of cell phones, texting, personal music players, and laptop computer use on attention—especially in drivers and pedestrians
- New Try This exercise on touch sensations

Chapter 4:

- Revised information on the number and labels for stages of sleep
- Updated information about nonconscious and unconscious mental processes
- Updated information about sleep disorders and treating sleep disorders
- New information about the functions of REM sleep and its effect on creativity
- New information about effects of sleep deprivation to reduce impact of trauma
- Latest information about chronotypes, and the “clock genes” that seem to drive them

- Updated information about applications of hypnosis and effects of meditation
- Updated information about neural effects of drugs, including epigenetic effects
- Latest information about the long-term effects of caffeine, nicotine, and opiates
- Latest information on the debate over medical uses of marijuana

Chapter 5:

- Latest information about the mechanisms of classical conditioning
- Latest information about the effects of reinforcers in the brain
- Updated information on applications of operant conditioning
- Updated information on the biological basis of observational learning
- Latest research on the impact of violent and prosocial television and video games
- Updated information on active learning methods in the classroom
- Latest research about e-media for delivery of college class materials
- Updated information on classrooms across cultures

Chapter 6:

- New information about hypermnnesia
- Updated information about scents as memory cues
- Updated information about false memories and eyewitness testimony
- Latest research on the biological basis of memory

Chapter 7:

- Updated information on judge and jury decision making
- New section on building effective problem-solving skills
- Latest information on advances in artificial intelligence
- Latest information about creativity and its biological roots
- New information about the effects of the physical environment on creative thinking
- Latest information on decision making in risky situations
- Updated information on group problem solving and decision making
- Latest information about bilingualism and long-term effects on cognition
- Updated information on extraneous influences on intelligence test results
- New research on stereotype threat
- Updated information on the interaction of environmental and genetic factors in intelligence, and on group differences in IQ

Chapter 8:

- New information about how eating habits have changed over centuries

- New Try This exercise to illustrate the facial feedback hypothesis
- Latest information on lie detection
- New section on intrinsic and extrinsic sources of motivation
- Updated information about hormonal influences on eating behavior
- Updated information about neurotransmitters and eating behavior
- Latest figures on obesity and new material on its causes and on prevention efforts
- Updated material on anorexia nervosa and bulimia
- Updated information about gender differences in sexuality
- Latest information about well-being and its relation to achievement
- New coverage of the conceptual act model of emotion
- New research on situational factors in reading facial expressions

Chapter 9:

- Updated information about behavioral genetics, genetic influences on development, and the influence of environmental factors on genetic expression
- Updated information on the effects of electronic and social media on infant, child, and adolescent development
- Updated information about midlife transition and the “sandwich generation”
- New and updated information about intellectual abilities in late adulthood, including risk factors and protective or mediating influences
- Updated information about the impact of alcohol, nicotine, and other toxins on infant development
- Latest information about infant thinking and behavior during the sensorimotor stage
- Latest information about influences of nature and the environment on children’s brain development
- Updated information about culture and cognitive development
- Updated information about poverty as a developmental danger
- Updated information on long-term effects of early attachment styles
- Updated information about parenting styles and their effects on child development
- Updated information on the development of infants’ theory of mind
- Updated statistics on adolescent sexuality and teenage pregnancy
- Updated information about emotional development during emerging adulthood
- New and updated information about longevity

Chapter 10:

- New information about the long-term effects of stressors early in life
- New statistics on worldwide deaths due to health-damaging behaviors

- Updated information about the cognitive effects of stressors on decision making and problem solving
- Updated information about posttraumatic stress disorder
- New information about the relationship among socioeconomic status, lack of control, and premature death in lower socioeconomic groups
- Updated information about associations between social networks and happiness
- Updated information about personality and resistance to stress
- Updated information about identifying people at elevated risk for health problems
- Updated information about health beliefs and efforts to change them

Chapter 11:

- New information about empirical research on psychodynamic theory
- Updated information about applications and biological basis of the Five-Factor Theory of personality
- New research on Gray's reinforcement sensitivity theory
- Updated information on personality research in nonhumans
- Updated information about the influence of genetics and epigenetics on personality traits
- Updated information about situational factors and the expression of personality traits
- Updated information about the possible impact of early attachment style in childhood and adulthood
- Updated information about the behavioral correlates of internal versus external locus of control
- Updated information about the effects of self-efficacy on achievement and well-being
- New information about the impact of positive psychology in personality
- Updated information about culture and personality
- Updated information about the latest edition of the Minnesota Multiphasic Personality Inventory (MMPI-2 RF)

Chapter 12:

- Updated information on the incidence of psychological disorders
- Presentation of the new *DSM-5* and the forthcoming *ICD-11*, and information about debates surrounding the changes made in *DSM-5*
- Updated information on diagnostic reliability and validity
- Updated information about bias in psychological diagnosis
- Updated coverage of causes of psychological disorders, including epigenetics
- New information about the effects of media-driven attitudes on people's understanding and response to psychological disorders
- Updated information about culture-specific disorders
- Coverage of cyberchondria, a term similar to "medical students' syndrome"

- Updated information about somatic symptom and dissociative disorders
- Updated statistics about the incidence of, and risk factors for, suicide
- Updated information about hallucinations in schizophrenia
- Updated statistics about the incidence of autistic spectrum disorders
- Updated information about psychological disorders and the law

Chapter 13:

- Updated information about the prevalence of psychological treatments in adults and children in the United States
- Updated information about research on the effectiveness of psychotherapy
- New and updated information about the evolution of evidence-based practice and empirically supported therapies
- Updated information about cultural diversity training for therapists
- Updated information about therapeutic effects of repetitive transcranial magnetic stimulation (rTMS) therapy, deep brain stimulation, and optogenetic stimulation
- Updated information about effectiveness, side effects, and costs and benefits of antidepressant drugs
- Updated information about human diversity and drug treatments
- Updated information about the effectiveness of psychoactive medications for mental disorders and their value in combination with psychotherapy
- Updated information about community psychology
- New and updated information about self-help and Internet-based therapy efforts

Chapter 14:

- New Try This exercises on attitude similarity and helping behavior
- New information about factors contributing to, or mediating, feelings of empathy
- New information about how social media affect feelings of attraction
- Updated information about terror management theory
- Updated information about the speed, strength, and accuracy of first impressions and factors that influence them
- Updated information about prejudice and its possible causes
- Updated information on the contact hypothesis and the mere-exposure effect in reducing prejudice
- Updated information on factors that contribute to attraction
- Updated information on gender and conformity
- Updated statistics about aggressive behavior in the United States

- Updated information about the possible biological and social factors affecting aggression
- New information about the possible effects of prosocial media on helping behavior
- New information on neuroimaging studies in social psychology

Chapter 15:

- Expanded history of industrial and organizational psychology
- Updated employment statistics for industrial and organizational psychologists
- Updated information about factors that influence job satisfaction
- Updated statistics about workplace violence
- Updated information about leader and follower behaviors
- Updated information about leader-member exchange (LMX) theory

Chapter 16:

- Updated information about how the interconnections of modules in the brain contribute to specific abilities and behaviors
- Updated information about the effects of strokes and the latest rehabilitation approaches
- Updated information about traumatic brain injuries and memory loss
- New information about traumatic brain injuries in sports
- Updated information about consciousness disturbances
- Updated information about brain activity and prosopagnosia
- Updated information about language disorders and frontotemporal degeneration
- Updated statistics about dementia
- New and updated information about the causes and symptoms of Alzheimer's disease
- Latest information about treatments for Alzheimer's disease

Special Features

The seventh edition of *Essentials of Psychology* contains improved versions of a number of special features found in its predecessor. Designed to promote efficient learning and mastery of the material, these include, in each chapter, an integrated pedagogical system as well as Thinking Critically, Focus on Research, Linkages, and Summary sections.

An Integrated Pedagogical System

The integrated pedagogical system is designed to help students get the most out of their reading. Based on the PQ4R study system (discussed in Chapter 6, “Memory”), learning aids in each chapter include the following elements.

Preview Section To help students survey and question the material, each chapter opens with an outline and a brief preview statement. A question related to the key topic of each main section of the chapter appears at the beginning of each of those main sections, and these questions appear again in the summary, where they help to organize the chapter's material.

Marginal Glossary Key terms are defined in the margin of the page where they appear, reinforcing core concepts without interrupting the flow of reading. All key terms have been revised to match those in the American Psychological Association's *Thesaurus of Psychological Index Terms* (11th ed.) and in the *APA Dictionary of Psychology*. Using key terms from these sources will help students do their own research by making it easier for them to use key-term searches in the field's most popular databases (PsycINFO & PsycARTICLES). Using these key terms will also improve students' abilities to transfer terms learned in the introductory course to their work in advanced courses. (For the seventh edition, I have continued to revise many of the phonetic guides to make it even easier for students to correctly pronounce unfamiliar key terms as well as other terms whose pronunciations are not immediately obvious.)

Instructional Captions Captions for all figures, tables, photographs, and cartoons reiterate core concepts and help students learn to interpret visual information. And, as mentioned earlier, many of these captions prompt students to engage in various kinds of active learning experiences.

In Review Charts In Review study charts summarize information in a convenient tabular format. I have placed two or three In Review charts strategically in each chapter to help students synthesize and assimilate large chunks of information—for example, on drug effects, key elements in personality theories, and stress responses and mediators. Three fill-in-the-blank self-testing items at the bottom of each In Review chart further aid student learning and review of the chapter material. The answer key for these items can be found at the back of the book.

Summary At the end of each chapter, the student will find the following:

- A chapter summary organized around major topic headings and the related preview questions. The summary is presented in short, easy-to-read paragraphs that focus on the topics introduced by chapter subheadings.
- A twenty-item multiple-choice self-test designed to help students assess their understanding of the chapter's key points prior to taking quizzes and exams. As before, I provide an answer key at the back of the book that identifies and briefly explains each correct answer.

Thinking Critically

A special Thinking Critically section in each chapter helps students hone this vital skill. My approach centers on describing

research on psychological phenomena in a way that reveals the logic of the scientific method, identifies possible flaws in design or interpretation, and leaves room for more questions and further research. In other words, as an author-teacher, I try to model critical thinking processes for my readers. The Thinking Critically sections are designed to make these processes more explicit and accessible by providing readers with a framework for analyzing evidence before drawing conclusions. The framework is built around five questions that the reader should find useful in analyzing not only psychological research studies but other forms of communication as well, including political speeches, advertising claims, and appeals for contributions. These five questions first appear in Chapter 1, where I introduce the importance of critical thinking, and they are repeated in every chapter's Thinking Critically section:

1. What am I being asked to believe or accept?
2. What evidence is available to support the assertion?
3. Are there alternative ways of interpreting the evidence?
4. What additional evidence would help evaluate the alternatives?
5. What conclusions are most reasonable?

Using this simple yet powerful framework, I explore issues such as subliminal persuasion, recovered memories, and the origins of sexual orientation, to name just a few. Page xvii includes a complete list of the Thinking Critically features.

Focus on Research

Psychological scientists have helped us better understand behavior and mental processes through their commitment to empirical research. They have posed vital questions about psychological phenomena and have designed research that can answer (or at least illuminate) those questions. In Chapter 1, I introduce readers to the methods of scientific research and to basic research designs in psychology. Every subsequent chapter features a Focus on Research section that highlights a particular research study to help students appreciate the value of research and the creativity with which psychologists have conducted it. Like the Thinking Critically sections, the Focus on Research features are organized around five questions designed to help readers organize their thinking about research questions and research results.

1. What was the researcher's question?
2. How did the researcher answer the question?
3. What did the researcher find?
4. What do the results mean?
5. What do we still need to know?

These Focus on Research sections help students see how psychological scientists have used experiments, correlational studies, surveys, observations, and other designs to explore phenomena such as learned helplessness, infant cognition, evolutionary theories of helping, and human sexual behavior. A full list of the Focus on Research features appears on page xvii.

Linkages

In my experience, introductory psychology students are better able to appreciate the scope of our discipline when they look at it not as a laundry list of separate topics but as an interrelated set of subfields, each of which contributes to—and benefits from—the work being done in all the others. To help students see these relationships, I have built into the book an integrating tool called Linkages. There are three elements in the Linkages program:

- **Linkages diagrams** At the end of every chapter is a Linkages diagram, which presents a set of questions that illustrate three of the ways that material in the chapter is related to other chapters in the book. For example, the Linkages diagram in Chapter 2, “Biological Aspects of Psychology,” contains questions that show how biological psychology is related to consciousness (“Does the brain shut down when we sleep?”), human development (“How do our brains change over a lifetime?”), and treatment of psychological disorders (“How do drugs help people diagnosed with schizophrenia?”). These diagrams are designed to help students keep in mind how the content of each chapter fits into psychology as a whole. To introduce the concept of Linkages, the diagram in Chapter 1 appears within the body of the chapter.
- **Linkages sections** One of the questions in each chapter's Linkages diagram reminds the student of the chapter's discussion of that question in a special section titled, appropriately enough, Linkages (see page xvii for a complete list of Linkages sections).
- **Marginal linkages reminders** There are many places throughout the book at which discussion of one topic, such as the functioning of the brain's cerebral cortex, is related to psychological skills, such as language. To help students recognize these links, a linkages question appears in the margin next to the discussion. In the example given here, the question is “Where are the brain's language centers? (a link to thought, language, and intelligence).”

These three elements combine with the text narrative to highlight the network of relationships among psychology's subfields. This Linkages program is designed to help students see the “big picture” that is psychology, no matter how many chapters their instructor assigns or in what sequence.

Teaching and Learning Support Package

Many useful instructional and pedagogical materials have been developed to support the *Essentials of Psychology* textbook and the introductory course. These are designed to enhance and maximize the teaching and learning experience. This seventh edition focuses on greater integration of the supplemental package components with the text itself. New

features of several supplements reflect the text's emphasis on active learning and writing across the curriculum.

Instructor's Companion Website

Find everything you need for your course in one place. This collection of book-specific lecture and class tools is available online via www.cengage.com/login. Access and download PowerPoint® presentations, instructor's manual, and more.

MindTap

MindTap for *Essentials of Psychology* creates a unique learning path that fosters increased comprehension and efficiency. It engages students and empowers them to produce their best work—consistently. In MindTap, course material is seamlessly integrated with videos, activities, apps, and more.

For students:

- MindTap delivers real-world relevance with activities and assignments designed to help students build critical thinking and analytical skills that can be applied to other courses and to their professional lives.
- MindTap serves as a single destination for all course materials so that students can stay organized and efficient and have the necessary tools to master the content.
- MindTap shows students where they stand at all times—both individually and compared to the highest performers in the class. This information helps to motivate and empower performance.

In MindTap, instructors can do the following:

- Control the content. Instructors select what students see and when they see it.
- Create a unique learning path. In MindTap, the *Discovering Psychology: The Science of Mind* text is enhanced with multimedia and activities to encourage and motivate learning and retention, moving students up the learning taxonomy. Materials can be used as is or modified to match an instructor's syllabus.
- Integrate their own content. Instructors can modify the MindTap Reader using their own documents or pulling from sources such as RSS feeds, YouTube videos, websites, Google Docs, and more.
- Follow student progress. Powerful analytics and reports provide a snapshot of class progress, time students spend logging into the course, and completion to help instructors assess level of engagement and identify problem areas.

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Doug Bernstein



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Introduction to the Science of Psychology

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1

1

PREVIEW

TRY THIS All of the following people hold truly interesting jobs. What do you think they studied to qualify for those jobs? See if you can correctly match each person in the left column with their field of study from the right column.

People	Fields of Study
Anne Marie Apanovitch works for a major drug company and determines which of their marketing strategies are most effective in promoting sales.	Engineering
Rebecca Snyder studies the giant pandas at Zoo Atlanta in an effort to promote captive breeding and ultimately increase the wild population of this endangered species.	Criminal Justice
Michael Moon's job at a software company is to find new ways to make websites easier for consumers to use.	Advertising
Sharon Lundgren , founder of Lundgren Trial Consulting, Inc., helps prepare witnesses to testify in court and teaches attorneys how to present their evidence in the most convincing way.	Psychology
Evan Byrne investigates the role of memory lapses, fatigue, disorientation, errors, and other human factors in causing airplane crashes for the U.S. National Transportation Safety Board.	Computer Science
Renee Timmers studies what musicians do when performing, including by recording performances under varying conditions and measuring listeners' responses.	Zoology
Captain Karen Orts , chief of mental health services at a U.S. Air Force base, provides psychotherapy to military personnel suffering combat-related stress disorders and teaches leadership courses to commissioned and noncommissioned officers.	Music

Because Captain Orts offers psychotherapy, you probably guessed that she's a psychologist, but what academic field did you associate with Rebecca Snyder, who studies giant pandas? It would have been perfectly reasonable to assume that she's a zoologist, but she, too, is a psychologist. So is Michael Moon, whose work on website design might suggest that he was a computer science major. And although Sharon Lundgren spends her time working with witnesses and conducting mock trials, she's a psychologist, not a lawyer. The fact is that all of these people are psychologists! They may not all fit your idea of what psychologists do, but as you'll see in this chapter (and throughout this book), psychology is much broader and more diverse than you might have expected. I hope that reading this book will give you a fuller understanding of psychology and that you will find the field to be as fascinating as I do.

This chapter begins our exploration of psychology with a brief look at some of its interrelated specialty areas, or *subfields*. I will also tell the story of how psychology came to be and review several theories and approaches that guide psychologists in their work.

You will also see that the activities of psychologists in virtually every subfield are affected by human diversity, especially by age, gender, race, ethnicity, and other individual characteristics encountered in today's multicultural societies. Finally, I will invite you to consider how critical thinking, scientific methods, and ethical standards guide psychologists as they conduct research and evaluate the evidence they collect. ■

The World of Psychology: An Overview

What is psychology, and how did it grow?

Psychology is the science that studies behavior and mental processes and seeks to apply that study in the service of human welfare. So although the seven people I've just described are engaged in many different kinds of work, they are all psychologists because they are all involved in studying, predicting, improving, or explaining some aspect of behavior and mental processes. But even this wide variety of jobs fails to capture the full scope of psychologists' interests. As a group, psychologists around the world are interested in the behaviors and mental processes that make people who they are in every culture. Many psychologists focus on what can go wrong in behavior and mental processes, such as psychological disorders, problems in childhood development, or stress-related illnesses. Others explore the factors that lead people to be happy and satisfied with their lives, to achieve at a high level, to be creative, to help others, and to develop their full potential as human beings. This focus on the things that make life most worth living is known as **positive psychology** (e.g., Donaldson & Rao, 2017; Lopez, Pedrotti, & Snyder, 2014).

Subfields of Psychology

To appreciate how many things come under the umbrella of *behavior and mental processes*, think for a moment about how you would answer the question, Who are you? Would you answer by describing your personality, the sharpness of your vision or hearing, your interests and goals, your job skills and accomplishments, your IQ, your cultural background, or your social skills? Perhaps you would describe a physical or psychological problem that bothers you. You could list these and dozens of other things about yourself, and every one of them would reflect some aspect of what psychologists mean by behavior and mental processes. When psychologists focus their work on particular aspects of behavior and mental processes, they enter one of psychology's many subfields. Let's take a quick look at the typical interests and activities of psychologists in these subfields; we will focus on many of them in more detail in later chapters.

- **Cognitive psychologists** study basic mental processes such as sensation and perception (see Figure 1.1), learning and memory, judgment, decision making, and



FIGURE 1.1 Husband and Father-in-Law

This figure is called "Husband and Father-in-Law" (Botwinick, 1961) because you can see an old man or a young man, depending on how you mentally organize its features. The elderly father-in-law faces to your right and is turned slightly toward you. He has a large nose, and the dark areas represent his coat pulled up to his protruding chin. However, the tip of his nose can also be seen as the tip of a younger man's chin; the younger man is in profile, also looking to your right, but away from you. The old man's mouth is the young man's neckband. Both men are wearing a broad-brimmed hat.

Source: J. Botwinick, "Husband and Father-In-Law: A reversible figure," from *American Journal of Psychology* 74 (pp. 312–313). Copyright © 1961 by the Board and Trustees of the University of Illinois. Used with permission of the University of Illinois Press.

TRY THIS

psychology The science that seeks to understand behavior and mental processes and to apply that understanding in the service of human welfare.

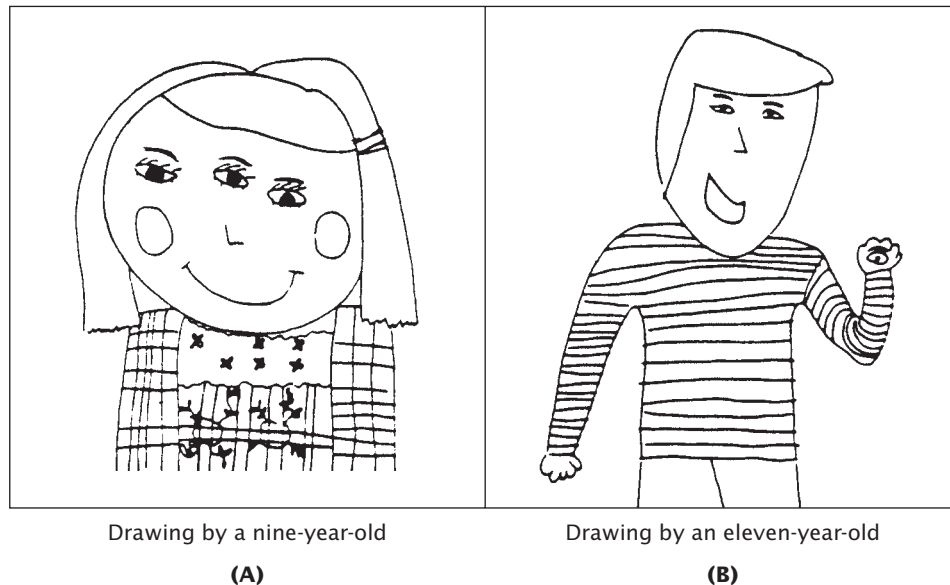
positive psychology A field of research that focuses on people's positive experiences and characteristics, such as happiness, optimism, and resilience.

cognitive psychologists Psychologists whose research focuses on analysis of the mental processes underlying judgment, decision making, problem solving, imagining, and other aspects of human thought or cognition.

FIGURE 1.2 Where Would You Put a Third Eye?

In a study of how thinking develops, children were asked to show where they would place a third eye if they could have one. Nine-year-old children, who were still in an early stage of mental development, drew the extra eye between their existing eyes, “as a spare.” Having developed more advanced thinking abilities, eleven-year-olds drew the third eye in more creative places, such as the palm of their hand “so I can see around corners.”

From Shaffer, *Developmental Psychology: Theory, Research and Applications*. Copyright © 1985 Wadsworth, a part of Cengage Learning Inc. Reproduced by permission. www.cengage.com/permissions



problem solving. Included in the wide range of fascinating topics they explore are such questions as whether people can forget (and then suddenly recover) traumatic memories, whether we can learn while asleep, and what role intuition and other unconscious processes play in guiding our thoughts and actions.

- **Biological psychologists**, also called *physiological psychologists* or *neuroscientists*, study topics such as the relationship of genes and brain chemistry to mental disorders, how brain cells communicate with each other in forming memories, whether certain patterns of brain activity can reveal that a person is lying, and how hormones released during stress affect the body’s immune system. Have you ever had the odd feeling that a new experience, such as entering an unfamiliar house, has actually happened to you before? Biological psychologists who study this experience of *déjà vu* (French for “already seen”) suggest that it may be due to a temporary malfunction in the brain’s ability to combine incoming information from the senses, creating the impression of two “copies” of a single event (Brown, 2004).
- **Personality psychologists** study individuality—the unique features of each person. Your personality traits, like your fingerprints, are different from those of any other person. Some personality psychologists use tests to describe how one individual compares with others in terms of openness to experience, emotionality, reliability, agreeableness, and sociability. Others study combinations of personality traits that may predict particular patterns of behavior. For instance, personality psychologists interested in positive psychology are identifying the characteristics of people who can remain optimistic even in the face of stress or tragedy and find happiness in life (Infurna & Luthar, 2016).
- **Developmental psychologists** study and describe how behavior and mental processes change over the life span in order to understand their causes and effects (see Figure 1.2). They explore areas such as the development of thought, friendship patterns, parenting styles, and whether everyone must face a midlife crisis. Some of their research has been used by judges and attorneys in deciding on the age at which a child can be considered as a reliable witness in court or as capable of choosing responsibly which parent to live with following a divorce.
- **Quantitative psychologists** develop and use statistical tools to analyze vast amounts of information generated by research results from all of psychology’s subfields. Later in this chapter you will see how quantitative psychologists use correlation coefficients and other statistical tools to evaluate psychological tests and to estimate the relative contributions of heredity and environment in determining our intelligence. To what extent are people born smart—or not so smart—and to what extent are

biological psychologists

Psychologists who analyze the biological factors influencing behavior and mental processes.

personality psychologists

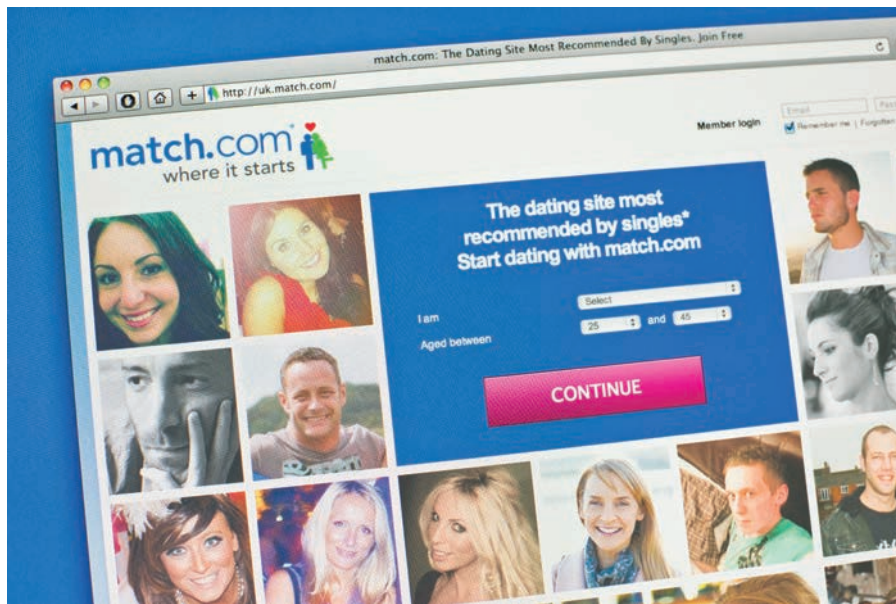
Psychologists who focus on people’s unique characteristics.

developmental psychologists

Psychologists who seek to understand, describe, and explore how behavior and mental processes change over the course of a lifetime.

quantitative psychologists

Psychologists who develop statistical methods for evaluating and analyzing data from psychological research.



Got a Match?

Some commercial matchmaking services apply social psychologists' research on interpersonal attraction in an effort to pair up people whose characteristics are most likely to be compatible.

their mental abilities affected by their environments? The work of quantitative psychologists is vital to research on this important topic.

- **Clinical, counseling, and community psychologists** study the causes of behavior disorders and offer services to help troubled people overcome these disorders. Generally, clinical psychologists have Ph.D. degrees in psychology; most provide therapy services, and many conduct research as well. A counseling psychologist might work as a mental health counselor and have either a Ph.D. or a master's degree in psychology. Community psychologists offer psychological services to the homeless and others who need help but who tend not to seek it. By working for changes in schools and other social systems, they also try to prevent poverty and other stressful conditions that so often lead to psychological disorder. All of these psychologists differ from *psychiatrists*, who are medical doctors who specialize in abnormal behavior.
- **Educational psychologists** conduct research and develop theories about teaching and learning. The results of their work are applied in programs designed to improve teacher training, refine school curricula, reduce dropout rates, and help students learn more efficiently. For example, educational psychologists support using the “jigsaw” technique, a cooperative classroom activity in which children from various racial or ethnic groups must work together to complete a task or solve a problem. Such experiences appear to promote learning, generate mutual respect, and reduce intergroup prejudice (Aronson & Patnoe, 2011).
- **School psychologists** originally specialized in intelligence testing, diagnosing learning disabilities and other academic problems, and setting up programs to improve students' achievement and satisfaction in school. Today, they also engage in preventing bullying, in early detection of students' mental health problems, and in crisis intervention following school violence (e.g., Crepeau-Hobson & Bianco, 2011; Golmaryami et al., 2016; Klein, Cornell, & Konold, 2012).
- **Social psychologists** study the ways that people influence one another. For example, their research on social-influence strategies has been applied in safe-sex advertising campaigns designed to halt the spread of AIDS (Friedman et al., 2016). They also explore how peer pressure affects us, what determines whom we like (or even love), and why and how prejudice forms. They have found, for example, that although we may pride ourselves on not being prejudiced, we may actually hold unconscious beliefs about certain groups that negatively affect the

clinical, counseling, and community psychologists Psychologists who seek to assess, understand, modify, and prevent behavior disorders.

educational psychologists Psychologists who study methods by which instructors teach and students learn and who apply their results to improve those methods.

school psychologists Psychologists who test cognitive abilities, diagnose students' academic problems, and set up programs to improve students' achievement.

social psychologists Psychologists who study how people influence one another's behavior and attitudes, especially in groups.

Getting Ready for Surgery

Health psychologists have learned that when patients are mentally prepared for a surgical procedure, they are less stressed by it and recover more rapidly. Their research is now routinely applied in hospitals through programs in which children and adults are given helpful information about what to expect before, during, and after their operations.



Dorothy Littell Greco/The Image Works

way we relate to people from those groups (Jacoby-Senghor, Sinclair, & Shelton, 2016; Vanman et al., 2004).

- **Industrial and organizational psychologists** study leadership, stress, competition, pay, and other factors that affect the efficiency, productivity, and satisfaction of workers and the organizations that employ them. They explore ways to increase employee motivation and help companies select the best new workers. They also look at the ways in which businesses and industrial organizations work—or fail to work—and they make recommendations to help these organizations work better. Companies all over the world apply research by industrial and organizational psychologists to foster *positive organizational behavior* through the development of employee training programs, effective goal-setting procedures, fair and reasonable evaluation methods, and systems for motivating and rewarding outstanding employee performance.

industrial and organizational psychologists Psychologists who examine factors that influence people's performance in the workplace.

health psychologists Psychologists who study the effects of behavior on health and the impact of illness on behavior and emotion.

sport psychologists Psychologists whose research is aimed at maximizing athletic performance.

forensic psychologists Psychologists who are involved in many aspects of psychology and law.

engineering psychologists Psychologists who study and try to improve the relationships between human beings and the computers and other machines they use.

environmental psychologists Psychologists who study the relationship between people's physical environment and their behavior.

Our list of psychology's subfields is still not complete. For example, **health psychologists** study the effects of behavior on health and the impact of illness on behavior and emotion; **sport psychologists** search for the keys to maximum athletic performance; and **forensic psychologists** assist in jury selection, evaluate defendants' sanity and mental competence to stand trial, and deal with other matters involving psychology and the law. **Engineering psychologists**, also known as *human factors psychologists*, study interactions between human beings and the computers, telephones, and other machines they use. Their research has been applied in the design of computer keyboards, Internet websites, aircraft instrument panels, controls for hospital beds and nuclear power plants, and even on-screen programming and navigation systems for automobiles and mobile phones that make them more logical, easier to use, and less likely to cause errors.

Environmental psychologists study the effects of the environment on people's behavior and mental processes (e.g., Graham, Gosling, & Travis, 2015). The results of their research are applied by architects and interior designers as they plan or remodel residence halls, shopping malls, auditoriums, hospitals, prisons, offices, and other spaces to make them more comfortable and functional for the people who will occupy them. (See Table 1.1 for a summary of the typical activities and work settings of psychologists in the United States.)

Linkages within Psychology and Beyond

Psychology's subfields are listed here as though they were separate, but they often overlap, and so do the activities of the psychologists working in them. When developmental



Will Hart/NBC/PhotoFest

Forensic Psychology

Forensic psychologists may assist police and other law enforcement agencies as well as courts in profiling criminals, evaluating the mental competence of defendants, participating in jury selection, and performing many other tasks related to psychology and the law. Actor B. D. Wong's performance as forensic psychiatrist Dr. George Huang on *Law and Order: SVU* was so accurate that the Media Psychology division of the American Psychological Association gave the show its award for excellence in the fictional portrayal of mental health professionals.

psychologists study the growth of children's thinking skills, for example, their research is linked to that of colleagues in cognitive psychology. Similarly, biological psychologists have one foot in clinical psychology when they look at how chemicals in the brain affect the risk of depression. And when social psychologists apply research on cooperation to promote group learning activities in classrooms, they link up with educational

TABLE 1.1 Typical Activities and Work Settings for Psychologists

The fact that psychologists can work in such a wide variety of settings and do so many interesting—and often well-paying—jobs helps account for the popularity of psychology as an undergraduate major (National Center for Education Statistics, 2017). Psychology courses also provide excellent background for students planning to enter medicine, law, business, and many other fields.

Percentage of Psychologists	Work Setting	Typical Activities
<p>A pie chart illustrating the distribution of psychologists across various work settings. The largest segments are Private Practice at 33.1% and Education at 32.4%. Other significant categories include Mental health facilities at 19.2%, Business, etc. at 5.8%, Other at 7.4%, and Schools at 3.1%.</p>	Colleges, universities, and professional schools	Teaching, research, and writing, often in collaboration with colleagues from other disciplines
	Mental health facilities (e.g., hospitals, clinics, counseling centers)	Testing and treatment of children and adults
	Private practice (alone or in a group of psychologists)	Testing and treatment of children and adults
	Business, government, and organizations	Testing potential employees; assessing employee satisfaction; identifying and resolving conflicts; improving leadership skills; offering stress management and other employee assistance programs; improving equipment design to maximize productivity and prevent accidents
	Schools (including those for intellectually disabled and emotionally disturbed children)	Testing mental abilities and other characteristics; identifying problem children; consulting with parents; designing and implementing programs to improve academic performance
	Other	Teaching prison inmates; research in private institutes; advising legislators on educational, research, or public policy; administering research funds; research effectiveness of military personnel; etc.

Source: Employment characteristics of APA members by membership status, 2015.

psychology. Even when psychologists work mainly in one subfield, they're still likely to draw on—and contribute to—the knowledge in other subfields.

So to understand psychology as a whole, you must understand the linkages among its subfields. In this book, to help you recognize these linkages, I highlight three of them in a diagram, similar to the one in Figure 1.3, near the end of every chapter. Each linkage is represented by a question that connects two subfields, and the chapter named is where you can read more about each question (look for “Linkages” symbols in those chapters).

There are so many linkages throughout the book that I could not include them all in the diagrams, but I hope these diagrams will remind you to look for linkages that I didn't mention. This kind of detective work can actually help you to do better on exams and quizzes, because it is often easier to remember material in one chapter by relating it to linked material in other chapters.

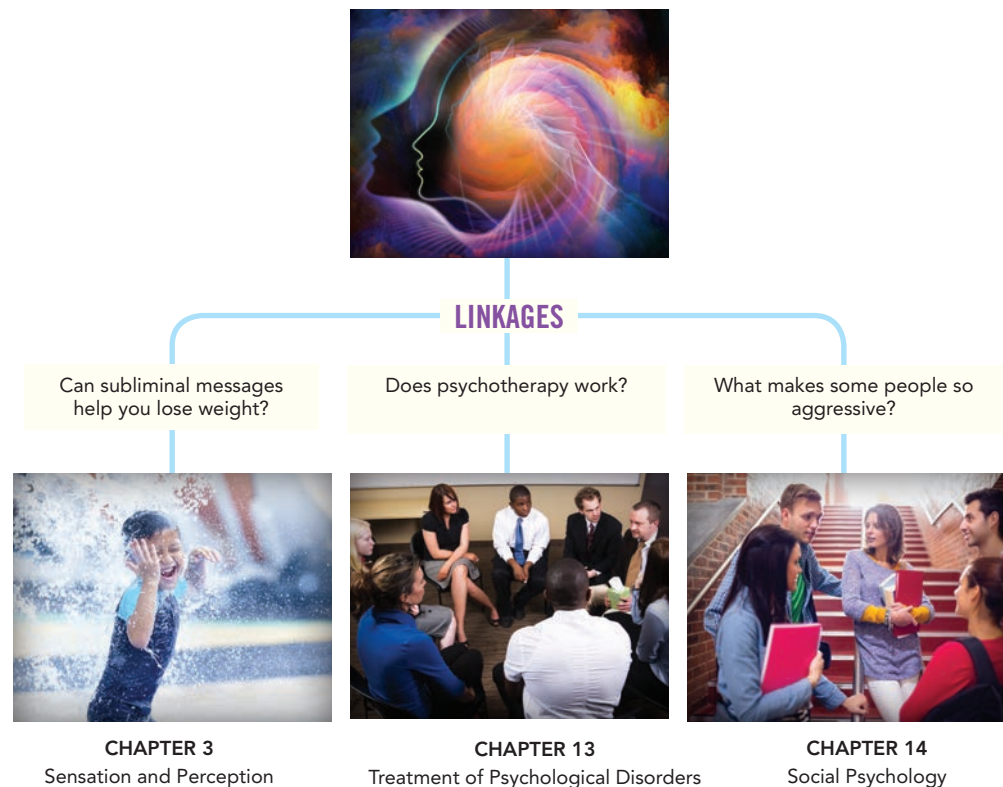
Psychology itself is linked to other disciplines. Some of these connections occur because psychologists share interests with researchers in other fields. For example, cognitive psychologists work with computer scientists to create artificial intelligence systems that can recognize voices, solve problems, and make decisions in ways that equal or exceed human capabilities. Other links occur when research in one discipline is applied in another. For example, physicians and economists are using research by psychologists to better understand the thought processes that influence (good and bad) decisions about caring for patients and choosing investments. In fact, psychologist Daniel Kahneman won a Nobel Prize in economics for his work in this area. Other psychologists' research on memory has influenced how lineups are displayed to eyewitnesses attempting to identify criminals, how attorneys question eyewitnesses in court, and how judges instruct juries. And psychological studies of the effects of brain disorders on elderly patients' mental abilities are shaping doctors' recommendations about when those patients should stop driving cars.

This book is filled with examples of other ways that psychological theories and research have been applied to fields as diverse as health care, law, business, engineering, architecture, aviation, and sports.

FIGURE 1.3 Linkages

The questions listed in this diagram highlight just three of the many ways in which psychology's subfields are linked to one another. Three additional linking questions appear in the Linkages diagram included in every chapter to come. Each chapter also contains a special Linkages feature that examines linked research in more detail. If you stay alert to the many linkages among psychology's subfields, you'll come away from your reading not only with threads of knowledge about each subfield but also with an appreciation of the fabric of psychology as a whole.

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Linking Psychology and Law

Cognitive psychologists' research on the quirks of human memory has led to revised guidelines for police and prosecutors when dealing with crime witnesses (U.S. Department of Justice, 1999; Wixted & Wells, 2017). These guidelines warn that asking witnesses leading questions (e.g., "Do you remember seeing a gun?") can distort their memories and that false accusations are less likely if witnesses are told that the real criminal might not be in a lineup or in a group of photos.

A Brief History of Psychology

Psychology is a relatively new science, but its origins can be traced through centuries. Since at least the time of Socrates, Plato, and Aristotle in ancient Greece, philosophers have debated such psychological topics as where human knowledge comes from, the nature of mind and soul, the relationship of the mind to the body, and even the possibility of scientifically studying these matters.

So scientific psychology has its roots in philosophy, and especially in a philosophical view called **empiricism** (pronounced "em-PEER-ih-sihz-em"). In the 1600s, empiricists such as John Locke, George Berkeley, and David Hume challenged the long-accepted claim that we are born with knowledge about our world. Instead, empiricists argued that our minds are more like a blank slate (*tabula rasa*, in Latin) on which our experiences write a lifelong story. In other words, according to empiricism, knowledge comes to us only through our experiences and observations. Empiricism has guided psychologists in seeking knowledge about behavior and mental processes through observations governed by the rules of science, rather than speculation, for almost 140 years.

Wundt and the Structuralism of Titchener The birth date of modern scientific psychology is usually said to be 1879, the year in which Wilhelm Wundt (pronounced "voont") established the first formal psychology research laboratory at the University of Leipzig in Germany (Benjamin, 2000). Wundt was a physiologist, and like other physiologists of his day, he had been studying vision, hearing, and other sensory-perceptual systems. However, Wundt's ambitious goal was to use the methods of laboratory science to study **consciousness**—the mental experience that arises from these systems. In doing so, Wundt began psychology's transformation from the *philosophy* of mental processes to the *science* of mental processes.

Wundt wanted to describe the basic elements of consciousness, including how they are organized and how they relate to one another (Schultz & Schultz, 2002). In an attempt to study conscious experience, Wundt used *introspection*, which means "looking inward." Edward Titchener, an Englishman who studied under Wundt, later used introspection in his own laboratory at Cornell University in the United States to study sensations, feelings, and images associated with conscious experience. To understand introspection, look at the object in Figure 1.4. Try to describe not what it is but only how intensely and clearly you

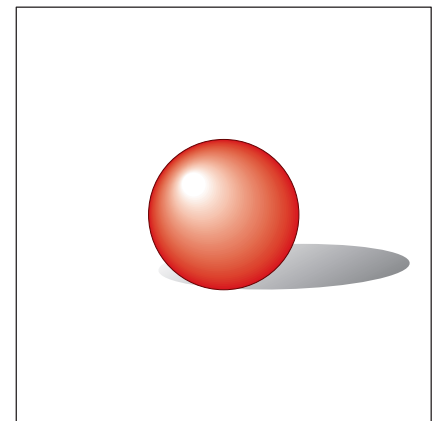


FIGURE 1.4 A Stimulus for Introspection

TRY THIS Look at this object, and try to ignore what it is. Instead, try to describe only your conscious experience, such as redness, brightness, and roundness, and how intense and clear the sensations and images are. If you can do this, you would have been an excellent research assistant in Titchener's laboratory.

empiricism The philosophical view that knowledge comes from experience and observation.

consciousness The awareness of external stimuli and our own mental activity.