

FOUNDATIONS AND FRONTIERS

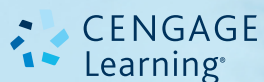
# Psychology



Douglas A. Bernstein

# FOUNDATIONS AND FRONTIERS Psychology

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For Doris

To the memory of our beloved friend and co-author,  
Alison Clarke-Stewart

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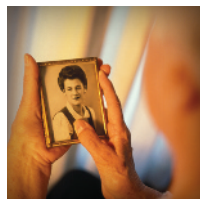
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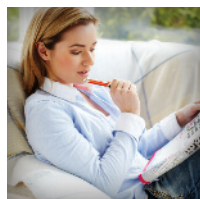
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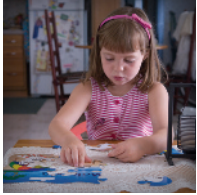
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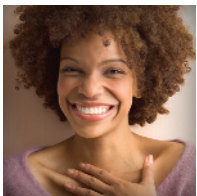
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# PREFACE

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, then, when they find themselves reading about such topics as the structure of the brain, optical illusions, the effect of jet lag on athletic performance, AIDS and the immune system, and prenatal risk factors, to name just a few. Yet these are all topics under the umbrella that is 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 created this new version of my introductory psychology textbook 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 of psychology that I hope will be especially accessible and interesting to students. And as the new title suggests, I have tried to describe the research foundations that have made psychological science what it is today, as well as the research frontiers that will be expanding the psychological science of tomorrow. I also tried to present all of this material through an integrated, active pedagogical system designed to help students get the most out of the text.

In the process, I remained dedicated to presenting a textbook that not only is clear and enjoyable to read but that 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 psychologists have solved (or are trying 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 4), classrooms across cultures (Chapter 5), ethnic differences in IQ (Chapter 8), social and cultural factors in sexuality (Chapter 10), gender differences in stress responses (Chapter 12), personality, culture, and human development (Chapter 11), gender and cultural differences in depression and suicide (Chapter 14), and cultural factors in aggression (Chapter 16), to cite just a few examples.

## What's New in *Foundations and Frontiers*?

In creating *Psychology: Foundations and Frontiers*, I have sought to update, upgrade, and combine all the best features of my two previous introductory psychology textbooks. I hope that the result of my effort is a book that offers even more of what psychology faculty and their students want and need.

## Organization

Designed for presentation in a single academic term, the book's chapter organization is similar but not identical to that found in both the brief and full-length versions that it replaces. There are eighteen chapters, including two formerly optional ones on industrial/organizational psychology and neuropsychology. The order of the chapters reflects the way I have always taught my introductory course, but I know that your preference for chapter sequencing may not match mine. Accordingly, you will find that each of the chapters works as a freestanding unit so that you may assign them 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 11. However, that chapter can be just as comfortably assigned earlier in the course.

## An Emphasis on Active Learning

The emphasis on active learning in my earlier textbooks proved popular with faculty and students, so I have continued to

emphasize it in the new book. You will find two kinds of “Try This” features throughout the book.

### TRY THIS

- First, dozens of 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 symbol.
- Second, I have placed Try This symbols 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 the student to focus attention on various targets as a way of appreciating the difference between overt and covert attention shifts.

### Active Review

My efforts to promote active learning can also be seen in two other elements of the book:

- A Linkages diagram at the end of each chapter is designed to help students understand and appreciate the ways that the chapter they have just read relates to other subfields of psychology.
- Twenty-item multiple-choice self-tests at the end of each chapter are focused on the applications as well as the definitions of principles, concepts, and phenomena.

### Updated Content

As always, I have tried to present the latest as well as the most established results of basic and applied research on topics that are both important in psychological science and of high interest to students. Here is a chapter-by-chapter summary of just some the new or updated material you will find in this new book:

#### Chapter 1 (Introduction):

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

#### Chapter 2 (Research Methods in Psychology):

- Latest research methods used to evaluate claims for the effectiveness of eye movement desensitization and reprocessing (EMDR) therapy

#### Chapter 3 (Biological Aspects of Psychology):

- New information on epigenetic influences in understanding the interacting roles of heredity and environment
- 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 4 (Sensation and Perception):

- 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 drivers and pedestrians
- New Try This exercise on touch sensations

#### Chapter 5 (Learning):

- 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 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 (Memory):

- 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 (Thought and Language):

- 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 effects of 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

#### Chapter 8 (Intelligence):

- 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 9 (Consciousness):

- 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 10 (Motivation and Emotion):

- 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 11 (Human Development):

- 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 12 (Health, Stress, and Coping):

- 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 (PTSD)
- 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 13 (Personality):

- New information about empirical research on psychodynamic theory
- Updated information about applications and biological basis of 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 14 (Psychological Disorders):

- 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 the media-driven attitudes on people's understanding and response to psychological disorders
- Updated information about culture-specific disorders
- Inclusion of *cyberchondria*, a term similar to "medical students' syndrome"
- Updated information about somatic symptom disorders 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 mental illness and the law



## Chapter 15 (Treatment of Psychological Disorders):

- 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 16 (Social Psychology):

- 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 in aggression

- New information on neuroimaging studies in social psychology

## Chapter 17 (Industrial and Organizational Psychology):

- 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 18 (Neuropsychology):

- 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

Several special features of *Foundations and Frontiers* are designed to promote efficient learning and mastery of the material. These include, in each chapter, an integrated pedagogical system as well as sections on Thinking Critically, Focus on Research Methods, and Linkages.

## An Integrated Pedagogical System

An 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 at the end of the chapter, where they help to organize the chapter summary.

**Margin 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 match those in the American Psychological Association's *Thesaurus of Psychological Index Terms* (11th ed.) and in the *APA Dictionary of Psychology*. I believe that 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 introductory courses to their work in advanced courses. (I have also revised many of the phonetic guides to make it even easier for students to correctly pronounce unfamiliar key terms as well as other terms whose pronunciation is 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. 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.

**Active Review** As mentioned earlier, the Active Review section at the end of each chapter includes

- A Linkages diagram containing questions that illustrate three of the ways that material in each chapter is connected to other chapters in the book.
- 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 sub-headings.
- A twenty-item multiple-choice test designed to help students assess their understanding of the chapter's key points prior to taking quizzes and exams.

## Thinking Critically

A special Thinking Critically section in each chapter helps students hone their skills in this vital area. 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 published psychological research, 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 xv includes a complete list of the Thinking Critically features.

## Focus on Research Methods

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 2, I introduce readers to the methods of scientific research and to basic research designs in psychology. Every subsequent chapter features a Focus on Research Methods 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 Methods 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 Methods sections help students see how psychologists 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 xv.

## 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 two elements in the Linkages program.

- **Linkages diagrams** At the end of each 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 3, “Biological Aspects of Psychology,” contains questions that show how biological psychology is related to consciousness (“Does the brain shut down when I 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 entitled, appropriately enough, Linkages (see page xv for a complete list of Linkages sections).

These 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” of 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 this textbook and the introductory course. These are designed to enhance and maximize the teaching and learning experience.

### MindTap for *Psychology: Foundations and Frontiers*

MindTap for *Psychology: Foundations and Frontiers* engages and empowers students to produce their best work—consistently. By seamlessly integrating course material with videos, activities,

apps, and much more, MindTap creates a unique learning path that fosters increased comprehension and efficiency.

For students:

- MindTap delivers real-world relevance with activities and assignments that help students build critical thinking and analytic skills that will transfer to other courses and their professional lives.
- MindTap helps students stay organized and efficient with a single destination that reflects what’s important to the instructor, along with the tools students need to master the content.
- MindTap empowers and motivates students with information that shows where they stand at all times—both individually and compared to the highest performers in class.

Additionally, for instructors, MindTap allows you to:

- Control what content students see and when they see it with a learning path that can be used as-is or matched to your syllabus exactly.
- Create a unique learning path of relevant readings and multimedia and activities that move students up the learning taxonomy from basic knowledge and comprehension to analysis, application, and critical thinking.
- Integrate your own content into the MindTap Reader using your own documents or pulling from sources like RSS feeds, YouTube videos, websites, GoogleDocs, and more.
- Use powerful analytics and reports that provide a snapshot of class progress, time in course, engagement, and completion.

## Available Supplements

### Cengage Learning Testing, powered by Cognero

Cengage Learning Testing Powered by Cognero® is a flexible, online system that allows you to: import, edit, and manipulate content from the text’s test bank or elsewhere, including your own favorite test questions; create multiple test versions in an instant; and deliver tests from your LMS, your classroom, or wherever you want.

### Online Instructor’s Manual

The instructor’s manual (IM) contains a variety of resources to aid instructors in preparing and presenting text material in a manner that meets their personal preferences and course needs. It presents suggestions and resources to enhance and facilitate learning.

### Online PowerPoints

These vibrant, Microsoft PowerPoint lecture slides provide concept coverage to assist you with your lecture.

## Acknowledgments

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Doug Bernstein





# Introducing Psychology



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## Preview

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
<b>Anne Marie Apanovitch</b> works for a major drug company and determines which of their marketing strategies are most effective in promoting sales.	Engineering
<b>Rebecca Snyder</b> 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
<b>Michael Moon's</b> job at a software company is to find new ways to make websites easier for consumers to use.	Advertising
<b>Sharon Lundgren</b> , founder of Lundgren Trial Consulting, Inc., prepares witnesses to testify in court and teaches attorneys how to present evidence in the most convincing ways.	Psychology
<b>Evan Byrne</b> investigates the role of memory lapses, fatigue, errors, and other human factors in causing airplane crashes for the U.S. National Transportation Safety Board.	Computer Science
<b>Captain Karen Orts</b> , 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.	Zoology

**Because Captain Orts offers psychotherapy, you probably guessed that she is 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 is a zoologist, but she, too, is a psychologist. So is Evan Byrne, 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 is a psychologist, not a lawyer. The fact is that *all* these people are psychologists! They may not all fit your ideas of what psychologists do, but as you will see in this chapter and throughout this book, psychology is much broader and more diverse than you may have expected. Reading this book will give you a fuller understanding of psychology, and we hope that you will find our field as fascinating as we do!

This chapter begins our exploration of psychology with a brief look at some of its interrelated specialty areas, or *subfields*. We then tell the story of how psychology came to be and review several theories and approaches that guide psychologists in their work. We also point out how the activities of psychologists in virtually every subfield are affected by human diversity, especially by age, gender, ethnicity, and other individual characteristics encountered in today's multicultural societies.

## 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. It is a science that covers a lot of territory, as illustrated by the vastly different jobs that occupy the six psychologists we described. They are all psychologists because they are all involved in studying, predicting, improving, or explaining some aspect of behavior and mental processes. Some of the world's half-million

**Psychology** The science of behavior and mental processes.

psychologists focus on what can go wrong in behavior and mental processes—psychological disorders, problems in childhood development, stress-related illnesses, and the like—while others study what goes right. They explore, for example, 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 what goes right, on the things that make life most worth living, has become known as **positive psychology** (e.g., Wood & Tarrier, 2010; Waterman, 2013), and you will see many examples of it in the research described throughout this book.

#### TRY THIS

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 now; we will focus on many of them in more detail in later chapters.

## Subfields of Psychology

When psychologists choose to focus their attention on certain aspects of behavior and mental processes, they enter one of psychology's subfields. Let's take a quick look at the typical interests and activities of psychologists in each subfield. We will describe their work in more detail in later chapters.

### Biological Psychology

**Biological psychologists**, also called *physiological psychologists*, study how the brain and the body's biological processes affect, and are affected by, behavior and mental processes. Have you ever had the odd feeling that a new experience, such as entering a new house, has actually happened to you before? Biological psychologists studying this illusion 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). In the chapter on biological aspects of psychology, we describe biological psychologists' research on many other topics, such as how your brain controls your movements and speech and what organs help you cope with stress and fight disease.

### Cognitive Psychology

**TRY THIS** Stop reading for a moment and look left and right. Your ability to follow this suggestion, to recognize whatever you saw, and to understand the words you are reading right now are the result of mental, or *cognitive*, abilities. Those abilities allow you to receive information from the outside world, understand it, and act on it. **Cognitive psychologists** (some of whom prefer to be called *experimental psychologists*) study mental abilities such as sensation and perception, learning and memory, thinking, consciousness, intelligence, and creativity. Cognitive psychologists have found, for example, that we don't just receive incoming information—we mentally change it. Notice that the drawing in Figure 1.1 stays physically the same, but two different versions emerge, depending on which of its features *you* emphasize.

Applications of cognitive psychologists' research are all around you. The work of those whose special interest is **engineering psychology**—also known as *human factors*—has helped designers create computer keyboards, mobile phones, MP3 players, websites, aircraft instrument panels, automobile navigation systems, nuclear power plant controls,

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

**biological psychologists** Psychologists who analyze the biological factors influencing behavior and mental processes. Also called *physiological psychologists*.

**cognitive psychologists** Psychologists who study the mental processes underlying judgment, decision making, problem solving, imagining, and other aspects of human thought or cognition. Also called *experimental psychologists*.

**engineering psychology** A field in which psychologists study human factors in the use of equipment and help designers create better versions of that equipment.



**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.

*From American Journal of Psychology. Copyright 1961 by the Board of Trustees of the University of Illinois. Used with permission of the University of Illinois Press.*

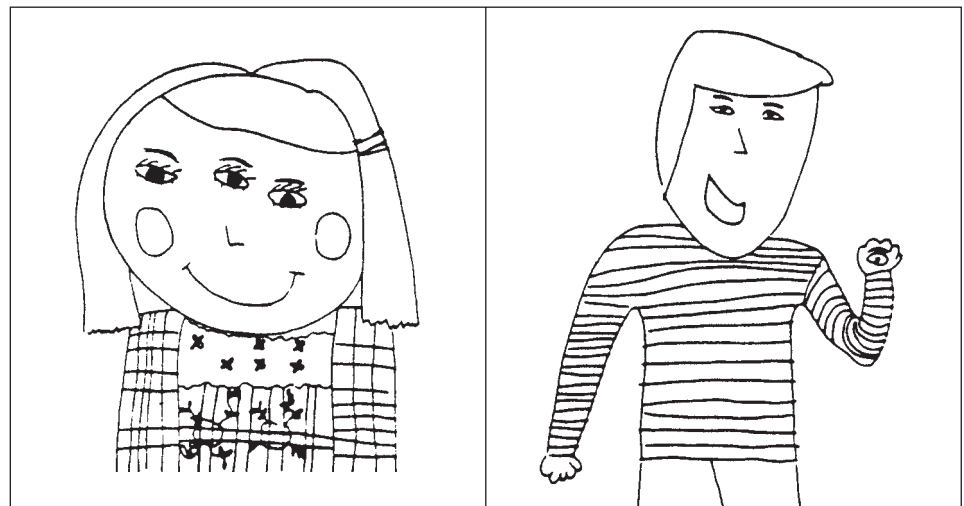
and even TV remotes that are more logical, easier to use, and less likely to cause errors. You will read more about human factors research and many other aspects of cognitive psychology in several chapters of this book.

### Developmental Psychology

**Developmental psychologists** describe how behavior and mental processes change from birth through old age and try to understand the causes and effects of those changes (see Figure 1.2). Their research on the development of memory and other mental abilities, for example, is used by judges and attorneys in deciding how old a child has to be in order to serve as a reliable witness in court or to be able to choose in a responsible way which divorcing parent to live with. The chapter on human development describes other research by developmental psychologists and how it is being applied in areas such as parenting, evaluating day care, and preserving mental capacity in elderly people.

### Personality Psychology

**Personality psychologists** study individuality—the unique features that characterize each of us. Using personality tests, some of these psychologists seek to describe how your own combination of personality traits, like your fingerprints, differs from everyone else’s in terms of traits such as openness to experience, emotionality, reliability, agreeableness, and sociability. Others study the combinations of personality traits that are associated with the appearance of ethnic prejudice, depression, bullying, or vulnerability to stress-related health problems. And personality psychologists interested in positive psychology are trying to identify and understand the human strengths that help people to remain optimistic, even in the face of stress or tragedy, and to find happiness in their lives (Snyder & Lopez, 2009).



Drawing by a nine-year-old

(A)

Drawing by an eleven-year-old

(B)

**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*

#### developmental psychologists

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

#### personality psychologists

Psychologists who study the characteristics that make individuals similar to or different from one another.

### 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 more information about what to expect before, during, and after their operations.

Dorothy Littell Greco/The Image Works



### Clinical, Counseling, Community, and Health Psychology

**Clinical psychologists** and **counseling psychologists** conduct research on the causes and treatment of mental disorders and offer services to help troubled people overcome those disorders. Their research is improving our understanding of the genetic and environmental forces that shape disorders ranging from anxiety and depression to schizophrenia and autism, and it is providing guidance to therapists about which treatment methods are likely to be most effective with each category of disorder.

**Community psychologists** work to ensure that psychological services reach the homeless and others who need help but tend not to seek it. They also try to prevent psychological disorders by promoting people's resilience and other personal strengths and by working with community leaders and neighborhood organizations to improve local schools and reduce the crime, poverty, and other stressful conditions that often lead to psychological disorders.

**Health psychologists** study the relationship between behaviors such as smoking or lack of exercise and the likelihood of suffering heart disease, stroke, cancer, or other health problems. They also explore the impact that illnesses such as diabetes, cancer, or multiple sclerosis can have on people's behavior, thinking, emotions, and family relationships. Their research is applied in programs that help people to cope effectively with illness, as well as to reduce the risk of cancer, heart disease, and stroke by changing the behaviors that put them at risk.

Generally, clinical psychologists have Ph.D. degrees in psychology; counseling, community, and health psychologists have either a Ph.D. or a master's degree in psychology. All of these psychologists differ from *psychiatrists*, who are medical doctors specializing in abnormal behavior (psychiatry). You can read more about the work of clinical, counseling, community, and health psychologists in the chapters on health, stress, and coping; psychological disorders; and treatment of psychological disorders.

### Educational and School Psychology

**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 and remember what they learn. For example, they have supported

**clinical and counseling psychologists** Psychologists who seek to assess, understand, and change abnormal behavior.

**community psychologists** Psychologists who work to obtain psychological services for people in need of help and to prevent psychological disorders by working for changes in social systems.

**health psychologists** Psychologists who study the effects of behavior and mental processes on health and illness and vice versa.

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



### 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.

*Jeff Morgan 03 / Alamy*



the use of the “jigsaw” technique, a type of classroom activity (described in the social psychology chapter) in which children from various ethnic groups must work together to complete a task or solve a problem. These cooperative experiences appear to promote learning, generate mutual respect, and reduce intergroup prejudice (Aronson, 2004).

**School psychologists** once specialized in IQ testing, diagnosing learning disabilities and other academic problems, and setting up programs to improve students' achievement and satisfaction in school. Today, however, they are also involved in activities such as preventing bullying, early detection of students' mental health problems, and crisis intervention following school violence.

### Social Psychology

**Social psychologists** study the ways that people think about others and how people influence one another. Their research on persuasion has been applied to the creation of safe-sex advertising campaigns designed to stop the spread of AIDS. Social psychologists 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 negative beliefs about certain groups that affect the way we relate to people in those groups. The chapter on social psychology describes these and many other examples of this area of research.

### Industrial and Organizational Psychology

**Industrial and organizational psychologists** conduct research on leadership, stress, competition, pay scales, and other factors that affect the efficiency, productivity, and satisfaction of people in the workplace. They also explore topics such as worker motivation, work team cooperation, conflict resolution procedures, and employee selection methods. Learning more about how businesses and industrial organizations work—or fail to work—allows industrial and organizational psychologists to make evidence-based recommendations for helping them work better. Today, companies all over the world are applying research from industrial and organizational psychology to

**school psychologists** Psychologists who test IQs, 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 mental processes, individually and in groups.

**industrial and organizational psychologists** Psychologists who study ways to improve efficiency, productivity, and satisfaction among workers and the organizations that employ them.

### Forensic Psychology

Forensic psychologists may assist police and other agencies 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 2004 Golden Psi award for excellence in the fictional portrayal of mental health professionals.

Will Hart/NBC/Photofest



promote the development of *positive organizational behavior*. The results include more effective employee training programs, ambitious but realistic goal-setting procedures, fair and reasonable evaluation tools, and incentive systems that motivate and reward outstanding performance.

### Quantitative Psychology

**Quantitative psychologists** develop and use statistical tools to analyze vast amounts of data collected by their colleagues in all of psychology's subfields. These tools help evaluate the quality of psychological tests, tracing the relationships between childhood experiences and adult behaviors, and even estimating the relative contributions of heredity and environment in shaping intelligence. To what extent are people born smart—or not so smart—and to what extent are their mental abilities created by their environments? This is one of the hottest topics in psychology today, and quantitative psychologists are right in the middle of it.

### Other Subfields

Our list of psychology's subfields is still not complete. There are **sport psychologists**, who use visualization and relaxation training programs, for example, to help athletes reduce excessive anxiety, focus attention, and make other changes that let them perform at their best. **Forensic psychologists** assist in jury selection, evaluate defendants' mental competence to stand trial, and deal with other issues involving psychology and the law. And **environmental psychologists** study the effects of the environment on people's behavior and mental processes. 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. There are also neuropsychologists, military psychologists, consumer psychologists, rehabilitation psychologists, and more.

Further information about the subfields we have mentioned—and some that we haven't—is available on the websites of the American Psychological Association and the Association for Psychological Science.

Where do the psychologists in all these subfields work? Table 1.1 contains a summary of where the approximately 172,000 psychologists in the United States find employment, as well as the kinds of things they typically do in each setting.

**quantitative psychologists** Psychologists who develop and use statistical tools to analyze research data.

**sport psychologists** Psychologists who explore the relationships between athletic performance and such psychological variables as motivation and emotion.

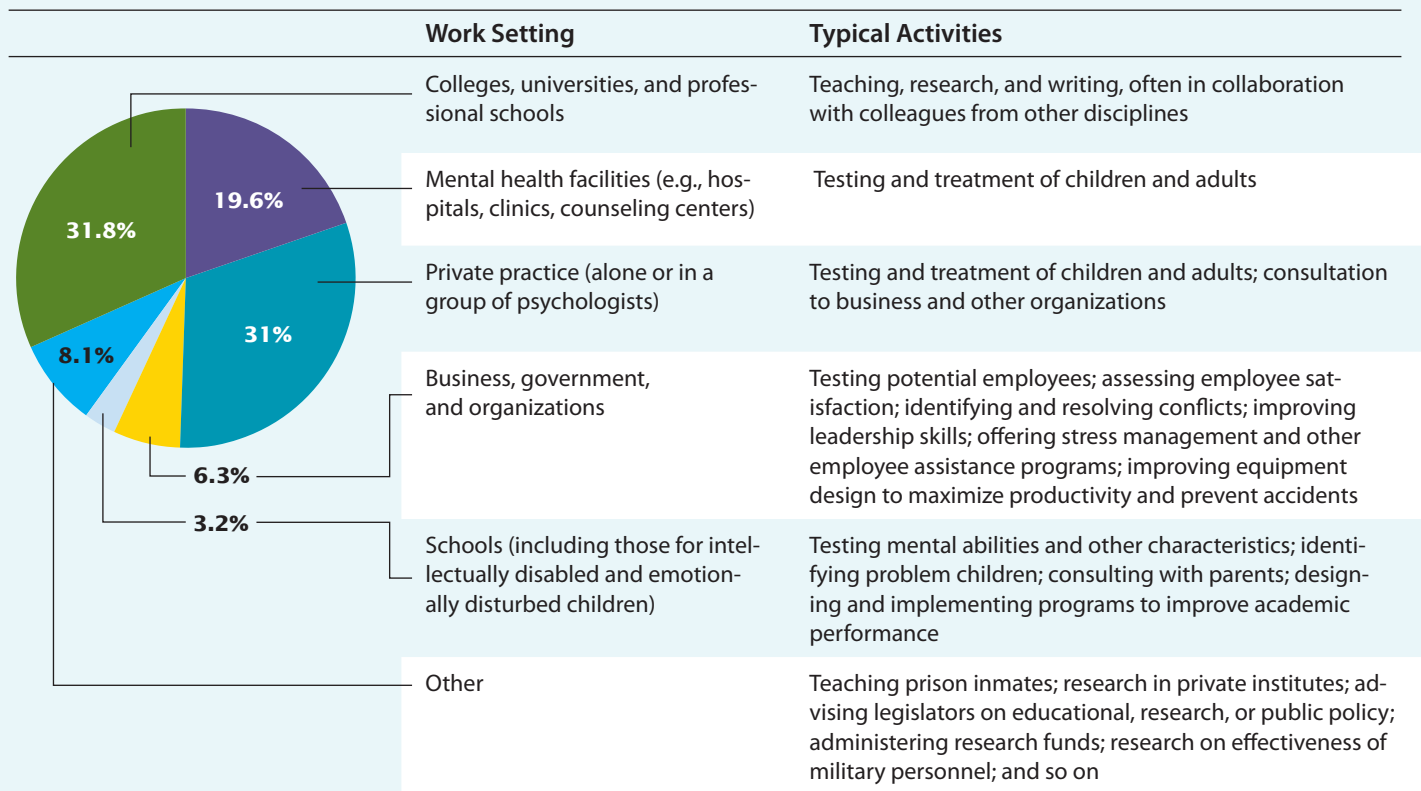
**forensic psychologists** Psychologists who assist in jury selection, evaluate defendants' mental competence to stand trial, and deal with other issues involving psychology and the law.

**environmental psychologists** Psychologists who study the effects of the physical environment on behavior and mental processes.



**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 (Goldstein, 2010; Dillow & Hoffman, 2008; National Center for Education Statistics, 2014). Psychology courses also provide excellent background for students planning to enter medicine, law, business, and many other fields.



Source: Employment characteristics of APA members by Membership status, 2012.

### Linkages Within Psychology and Beyond

We have listed psychology’s subfields as though they were separate, but they often overlap, and so do the activities of the psychologists working in them. When developmental psychologists study the changes that take place in children’s thinking skills, for example, their research is linked to the research of cognitive psychologists. Similarly, biological psychologists have one foot in clinical psychology when they look at how chemicals in the brain affect the symptoms of depression. And when social psychologists apply their research on cooperation to promote group learning activities in the classroom, they are linking up with educational psychology. Even when psychologists work mainly in one subfield, they are still likely to draw on, and contribute to, knowledge in other subfields.

So to understand psychology as a whole, you must understand the linkages between its subfields. In this book, to help you recognize these linkages, we highlight three of them in a Linkages diagram at the end of each chapter—similar to the one shown here. Each linkage is represented by a question that connects two subfields, and the chapter given is where you can read more about each question (look for “Linkages” symbols in those chapters). We pay particular attention to one of the questions in each diagram by discussing it in a special Linkages section. If you follow the linkages in these diagrams, you will see more clearly how psychology’s many subfields are interconnected. You find this kind of detective work to be interesting, and it will lead you to see many other linkages that we did not mention. Tracing linkages might even improve your grade in the course, because it is often easier to remember material in one topic by relating it to linked material in other topics.