EIGHTH EDITION

Psychology

CORE CONCEPTS

Philip Zimbardo • Robert Johnson • Vivian McCann

Pearson

Psychology

Core Concepts

Eighth Edition

Philip Zimbardo
Stanford University

Robert Johnson
Umpqua Community College

Vivian McCann
Portland Community College

Pearson

330 Hudson Street, NY, NY 10013

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Brief Contents

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Contents

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To the Student …

There is one simple formula for academic success, and the following demonstration will show you what it is. Study this array of letters for a few seconds:

I B M U F O F B I L O L

Now, without peeking, write down as many of the letters as you can (in the correct order).

Most people remember about five to seven letters correctly. A few people get them all. How do these exceptional few do it? They find a pattern. (You may have noticed some familiar initials in the array above: IBM, UFO, FBI, LOL.) Finding the pattern greatly eases the task because you can draw on material that is already stored in memory. In this case, all that needs to be remembered are four "chunks" of information instead of 12 unrelated letters.

The same principle applies to material you study for your psychology class. If you try to remember each piece of information as a separate item, you will have a difficult time. But if instead you look for patterns, you will find your task greatly simplified—and much more enjoyable.

Using Psychology to Learn Psychology

So, how can you identify the patterns? Your friendly authors have developed several learning features that will make meaningful patterns in the text stand out clearly:

CORE CONCEPTS We have organized each major section of every chapter around a single big idea called a Core Concept. For example, one of the four Core Concepts in Chapter 5, *Memory*, says:

> **Core Concept**
>
> Human memory is an information-processing system that works constructively to encode, store, and retrieve information.

The Core Concept, then, becomes the central theme around which about 10 pages of material—including several new terms—are organized. As you read each chapter, keeping the Core Concept in mind will help you encode the new terms and ideas related to that concept, store them in your memory, and later retrieve them when you are being tested. To borrow an old saying, the Core Concepts become the "forest," while the details of the chapter become the "trees."

KEY QUESTIONS Each Core Concept is introduced by a Key Question that also serves as a main heading in the chapter. Here, for example, is a Key Question from the *Memory* chapter:

Key Question: Why Does Memory Sometimes Fail Us, and What Can We Do About It?

Key Questions such as this will help you anticipate the most important point, or the Core Concept, in the section. In fact, the Core Concept always provides a brief answer to the Key Question. Think of the Key Question as the high beams on your car, helping you focus on what lies ahead. Our Key Questions should also serve as guides for you in posing questions of your own about what you are reading.

Both the Key Questions and the Core Concepts later reappear as organizing features of the Chapter Summary.

PSYCHOLOGY MATTERS Psychology has many captivating connections with events in the news and in everyday life, and we have explored one of these connections at the end of each major section in every chapter. To illustrate, here are some examples from the *Memory* chapter:

- Would You Want a "Photographic" Memory?
- "Flashbulb" Memories: Where Were You When … ?
- On the Tip of Your Tongue

Such connections—practical, down to earth, and fascinating—will help you link your study of psychology with your real-life experiences. They will also help you critically evaluate many of the psychological ideas you encounter in the media—as when you see news stories that begin with "psychological research shows that …" By the end of this course, you will become a much wiser consumer of such information. Some of these features have a special focus on applying psychology to learning and studying, so students gain practical tips on how to "Use Psychology to Learn Psychology."

DO IT YOURSELF! Throughout the text we have scattered active-learning demonstrations like the one in which you were asked to memorize the letters I B M U F O F B I L O L. Besides being fun, these activities have the serious purpose of illustrating important principles discussed in the text. In Chapter 5, for example, one *Do It Yourself!* box helps you find the capacity of your short-term memory; another lets you test your "photographic memory" ability.

KEY TERMS The most important terms appear in **boldface,** with their glossary definitions readily accessible when you rollover the term. We list these terms again in the Chapter Summary. Then, at the end of the text, a

comprehensive glossary gathers together all the key terms and definitions from each chapter in one easy-to-find location.

CHAPTER SUMMARIES We have written our Chapter Summaries to provide you with an overview of main points in each chapter—to help you preview and review the chapter. The summaries are organized around the Key Questions and Core Concepts introduced within the chapter to facilitate review and mastery of chapter material. But we offer one caution: Reading the Chapter Summary will not substitute for reading the entire chapter! Here's a helpful hint: We recommend that you read the summary before you read the rest of the chapter to get a flavor of what's ahead, then reread the summary after you finish the chapter. Reading the summary before will provide a framework for the material so that it can be more easily encoded and stored in your memory. And, naturally, reviewing the summary after reading the chapter will reinforce what you have just learned so that you can retrieve it when needed on an examination.

Thinking Like a Psychologist

Learning all the facts and definitions of psychology won't make you a psychologist. Beyond the facts, *thinking like a psychologist* requires learning some *problem-solving* skills and *critical thinking* techniques that any good psychologist should possess. With this goal in mind, we have added two unique features to this text.

CHAPTER-OPENING PROBLEMS Each chapter begins with an important problem that you will learn how to solve with the tools you acquire in your reading. Examples of the chapter-opening problems include testing the claim that sweet treats give children a "sugar high," evaluating claims of recovered memories, and judging the extent to which the people we call "geniuses" are different from the rest of us.

CRITICAL THINKING APPLIED At the end of each chapter, you will be asked to consider issues disputed among psychologists and issues raised in the media, such as the nature of the unconscious mind and the effects of subliminal persuasion. Each of these issues requires a skeptical attitude and the application of a special set of critical thinking skills that we will introduce in Chapter 1.

We have one final suggestion to help you succeed in psychology: This text is filled with examples to illustrate the most important ideas, but you will remember these ideas longer if you generate your own examples as you study. This habit will make the information yours as well as ours. And so we wish you a memorable journey through the field we love.

Phil Zimbardo
Bob Johnson
Vivian McCann

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New To This Edition

The new *Psychology: Core Concepts,* 8th ed., comes in an electronic format, available from the "cloud" both on standard computers and mobile devices. The features you know and love from the seven earlier editions are all there: Key Questions, Core Concepts, the Chapter Problem, Critical Thinking Applied, and an emphasis on diversity and cross-cultural psychology—all presented with an engaging writing style and clear examples of every concept.

The new electronic format takes reader interactivity with the material to a new level through videos, slideshows, an interactive virtual brain, and click-and-reveal activities aimed to promote deeper thinking and analysis of topics and concepts. Assessment activities are woven into each section, and include brief "journaling" questions and Shared Writing (a form of discussion board activity), all carefully crafted to encourage and improve critical thinking.

And, of course, the new edition introduces many new and exciting developments in psychology. Examples include the exploding field of epigenetics and its implications for development, health, and mental disorder; initiatives to develop brain-based alternatives to the DSM-5; Bandura's theory of moral disengagement to help explain immoral acts; and the amazing power of *mindset,* discovered by Carol Dweck. All the new material is linked with one of psychology's Core Concepts.

This edition of *Psychology: Core Concepts* is certainly no perfunctory revision or slap-dash update. In addition to our revolutionary new Revel format, here is a more

detailed, chapter-by-chapter look at the new material in the 8th edition:

Chapter 1–Mind, Behavior, and Psychological Science

- The opportunities and ethical issues in using Social Media Websites (SMWs) for research
- Applying Critical Thinking Guidelines to the issue of whether childhood vaccinations cause autism
- Updated careers in psychology including environmental psychology and geropsychology

Chapter 2–Biopsychology, Neuroscience, and Human *Nature*

- Epigenetics, and how experiences change gene expression, including the effects of touch, exercise, nutrition, and toxins on stress, health, and development
- New findings on plasticity, including the effects of porn on the brain
- Traumatic brain injury and plasticity
- New research on the cerebellum's important role in cerebral functions, facilitating emotional, sensory, and cognitive functioning – and possibly even involved in schizophrenia
- The latest in brain implants
- Critically thinking about mirror neurons

Chapter 3–Sensation and Perception

- Understanding how Muller cells tunnel light through the layers of the retina
- New research on pain
- Update on the psychology of hearing loss
- Update on the What and the Where pathways in the brain
- Many new illustrations and illusions

Chapter 4–Learning and Human *Nurture*

- Expanded coverage of classical conditioning in advertising, including humor, product placement, celebrity endorsement, and evaluative conditioning
- Classical conditioning techniques applied to wildlife management and conservation
- Expanded section on use of token economies in all levels of education, from kindergarten to college, as well as home and clinical uses
- An update on media and video-game violence
- New information and examples of social learning in the animal world
- Applications of social learning theory to solve social problems (family planning, HIV awareness, adult literacy, etc.)
- New findings examining how social interactions promote political actions.

Chapter 5–Memory

- Chapter re-worked to emphasize application to study strategies and students' lives throughout
- The biological basis of transience – how remembering can actually cause forgetting
- New research demonstrating that prospective memory accounts for half of memory loss, including strategies for overcoming this problem
- The neuroscience of PTSD and memory

Chapter 6–Thinking and Intelligence

- Use of analogies in engineering and marketing
- New examples of functional fixedness, mental set, hindsight bias, and anchoring
- Nobel-laureate Daniel Kahneman's 2-stage theory of thinking
- Updated section on creativity, including Shelley Carson's work on the minds of highly creative people
- New findings on intelligence, including changes in the Flynn Effect
- The DSM-V and Intellectual Disability
- Theory of mind in animals
- The effects of poverty and nutrition on neural development
- Carol Dweck's work on fixed vs. growth mindsets
- The newest findings on stereotype threat and performance, including interventions
- Do brain training programs like Lumosity really work? What the research reveals

Chapter 7–Development Over the Lifespan

- The latest research on neural development in early life, including plasticity, pruning and possible connection to autism, and sensitive periods
- Oxytocin in infant massage and optimal development
- Effects of poverty and nutrition on development
- Updated and expanded section on ADHD, including a positive viewpoint on ADHD
- Updated research on body image and sexuality in adolescence
- Bandura's theory of moral disengagement, and its application to understanding immoral actions, including bullying and cyberbullying
- Zimbardo's work on the Demise of Guys – challenges young men are experiencing in the 21st century
- The sexualization of girls

Chapter 8–States of Consciousness

- The newest research on patients' awareness during coma and persistent vegetative states, and what family

and medical professionals can do to help a person recover from this state
- Updated section on the default network in daydreaming
- Revised and updated section on dreaming, including the latest research on dreaming and memory, as well as cultural perspectives on dreaming
- The latest data on trends in drug use in teens and adults
- Medical uses of marijuana

Chapter 9–Motivation and Emotion

- How social and emotional learning enhances student achievement
- The new psychology of pride
- Emotional influences on memory
- Update on the biopsychology and evolutionary psychology of weight control and of sexuality
- Update on facial expressions of emotion
- Update on Walter Mischel and his "marshmallow test"

Chapter 10–Personality

- All major theories of personality organized around case study of Mary Calkins, pioneering female psychologist
- Personality disorders introduced here (and revisited in Disorders chapter)
- Understanding people who engage in unusual behavior, such as mass murder
- Big Five traits related to US geography and Facebook user styles
- Positivity as core of personality and well-being
- Updated presentation of the Myers-Briggs (MBTI)
- Existential approach to understanding personality, and logo therapy
- Updated research on Hardiness and grit
- Time Perspectives as a personality style
- Adverse economic conditions, like unemployment, impact personality functioning
- Role of contexualism in understanding cultural shaping of personality
- Uniqueness of individual personality–much like fingerprints and snowflakes

Chapter 11–Social Psychology

- New Hollywood movies on Milgram's research, *Experimenter,* 2015, and Zimbardo's prison study, *The Stanford Prison Experiment*, 2015.
- Heroic defiance of evil situations, with powerful examples.
- Updated examples of Milgram obedience study power effects and recent real world instances.
- Expanded section on dehumanization and its role in recent genocides.
- Implicit racial bias in criminal sentencing.
- Expanded treatment of system power.
- Expanded, updated treatment of bullying.
- Expanded, updated treatment of terrorism.
- Social pain from various sources is comparable to physical pain.

Chapter 12–Psychological Disorders

- Just as the new DSM-5 comes out, the NIMH and other powerful groups are re-conceptualizing mental disorders along the lines suggested by brain research
- Epigenetics plays a role in mental disorder
- Hallucinations are influenced by culture: The voices can be comforting for some
- Has a biological marker for schizophrenia been found at last?
- Autism may reflect a failure to "prune" synapses in the first few years of life

Chapter 13–Therapies for Psychological Disorders

- New, nontraditional therapies: teletherapy, exercise, and culturally adapted therapies
- Reasons for the increased use of biomedical therapies
- Ethical debate: Use of memory-numbing drugs for PTSD and for soldiers in combat
- Update on evidence-based practice
- Update on electro-convulsive therapy

Chapter 14–Stress, Health, & Well-Being

- Social rejection, being shunned as "silent bullying", with personal account by Zimbardo
- PTSD, new research on neurobiological effects of blast exposure, as well as effective treatment with time perspective therapy
- Negative effects of growing up in poverty on brain functioning
- Expanded and updated section on burnout and job stress
- Frankel's search for meaning in existence
- The power of physical exercise in mental and physical health
- The failure of national health promotion campaigns
- Happiness research and personal applications

A Note of Thanks

Nobody ever realizes the magnitude of the task when taking on a textbook-writing project – a process that grew exponentially this edition with our transition to the digital format. Pearson Content Manager Carly Czech superbly reigned over the process, gracefully managing

to balance a big-picture view of scheduling and workflow with careful attention to the details of each chapter and the text as a whole, while keeping the entire team on track and supported at every turn and ensuring that our text meets our many mutual goals. Project Manager Mickey Mankus deftly guided (and prodded) us through this process, providing timely reminders and friendly encouragement when deadlines loomed. The keen eye of Developmental Editor Julie Kelly helped ensure that our narrative remained tight and student-friendly, and Julie also juggled the multiple movements of each chapter between the authors and many other members of our team, somehow keeping track of it all. The vision of the eighth edition blossomed into reality under the skillful guidance of Rashida Patel and Shobhita Tripathi, our brilliant Instructional Designers, who has made this new edition a learning package that we had previously only dreamed of.

The job of making the manuscript into the dual offering of both a digital product and a printed textbook fell to Production Project Manager Megha Bhardwaj and Kristin Landon, our copyeditor. We think they did an outstanding job—as did our tireless photo researcher, Jen Simmons.

We are sure that none of the above would be offended if we reserve our deepest thanks for our spouses, closest colleagues, and friends who inspired us, gave us the caring support we needed, and served as sounding boards for our ideas. Phil thanks his wonderful wife, Christina Maslach, for her endless inspiration and for modeling what is best in academic psychology. He has recently passed a milestone of 50 years of teaching the introductory psychology course, from seminar size to huge lectures to more than 1,000 students. Phil continues to give lectures and colloquia to college and high school groups throughout the country and overseas. He still gets a rush from lecturing and from turning students on to the joys and fascination of psychology. His new "psych rock star" status comes mostly from generations of students who have grown up watching him perform on the *Discovering Psychology* video series in their high school and college psychology courses.

Bob is grateful to his spouse, best friend, and best editor Michelle, who has for years put up with his rants on topics psychological, his undone household chores, and much gratification delayed—mostly without complaint. She has been a wellspring of understanding and loving support and the most helpful of reviewers. His thanks, too, go to Rebecca, their daughter, who has taught him the practical side of developmental psychology—and now, much to her own astonishment and an undergraduate lapse into sociology, possesses her own graduate degree in psychology. In addition, he is indebted to many friends, most of whom are not psychologists but who are nevertheless always eager to raise and debate interesting issues about the applications of psychology to everyday life. Readers will find topics they have raised throughout the text and especially in the chapter-opening "problems" and in the critical thinking sections at the end of each chapter.

Vivian's thanks go first to her husband, Shawn for his love , support, and impish humor in times of stress. Writing two books at the same time - while still teaching full-time – turned out to be a challenge beyond our wildest dreams (or nightmares), and Shawn and their son Blaze graciously endured months of wondering if Vivian would ever emerge from her office! They pitched in like the champs they are, though, keeping the household chores done, finding ways to amuse and occupy themselves and our dogs, and suffering through way too much fast food. Vivian also appreciates the many students, friends, and colleagues who have both encouraged and challenged her over the years, along with Executive Editor Stephen Frail for first suggesting that she join the author team of Phil Zimbardo and Bob Johnson. Many psychological experts and expert teachers of introductory psychology also shared their constructive criticism with us on every chapter and feature of the eighth edition of this text: Chris Brill, Old Dominion University; Allison Buskirk, Cohen, Delaware Valley College; Christie Chung, Mills College; Elizabeth Curtis, Long Beach City College; Linda DeKruif, Fresno City College; Carrie E. Hall, Miami University; Jeremy Heider, Stephen F. Austin State University; Brian Littleton, Kalamazoo Valley Community College; Lillian McMaster, Hudson County Community College; Nancy Melucci, Long Beach City College; Jared Montoya, The University of Texas at Brownsville; Suzanne Morrow, Old Dominion University; Katy Neidhardt, Cuesta Community College; Donna Nelson, Winthrop University; Barbara Nova, Dominican University of California; Karl Oyster, Tidewater Community College; Sylvia Robb, Hudson County Community College; Hildur Schilling, Fitchburg State College; Hilary Stebbins, Virginia Wesleyan College; Doris Van Auken, Holy Cross College

We also thank the reviewers of the previous editions of *Psychology: Core Concepts* and hope that they will recognize their valued input in all that is good in this text.

Finally, we offer our thanks to all of the colleagues whose feedback has improved our book. Thanks also to all instructors of this most-difficult-to-teach course for taking on the pedagogical challenge and conveying to students their passion about the joys and relevance of psychological science and practice.

If you have any recommendations of your own that we should not overlook for the next edition, please write to us! Address your comments to our Facebook page: https://www.facebook.com/Psychology-Core-Concepts-214526791978469/.

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About the Authors

Philip Zimbardo, PhD, Stanford University professor, has been teaching the introductory psychology course for 50 years and has been writing the basic text for this course, as well as the faculty guides and student workbooks, for the past 35 years. In addition, he has helped to develop and update the PBS-TV series, *Discovering Psychology*, which is used in many high school and university courses both nationally and internationally. He has been called "The Face and Voice of Psychology" because of this popular series and his other media presentations. Phil also loves to conduct and publish research on a wide variety of subjects, as well as teach and engage in public and social service activities. He has published more than 400 professional and popular articles and chapters, including 50 books of all kinds. He recently published a trade book on the psychology of evil, *The Lucifer Effect*, that relates his classic Stanford Prison Experiment to the abuses at Iraq's Abu Ghraib Prison. In addition, Phil is delighted by the new Hollywood movie, The Stanford Prison Experiment (2105) on which he actively consulted. His newest books are *The Time Paradox*, and *The Time Cure*, but his new passion is helping to create wise and effective everyday heroes as part of his Heroic Imagination Project. Please see these websites for more information: www.zimbardo.com; www.prisonexp.org; www.PsychologyMatters.org; www.theTimeParadox.com; www.LuciferEffect.com; www.HeroicImagination.org.

Robert Johnson, PhD, taught introductory psychology for 28 years at Umpqua Community College. He acquired an interest in cross-cultural psychology during a Fulbright summer in Thailand, followed by many more trips abroad to Japan, Korea, Latin America, Britain, and, most recently, to Indonesia. Currently, he is working on a book on the psychology in Shakespeare. Bob is especially interested in applying psychological principles to the teaching of psychology and in encouraging linkages between psychology and other disciplines. In keeping with those interests, he founded the Pacific Northwest Great Teachers Seminar, of which he was the director for 20 years. Bob was also one of the founders of Psychology Teachers at Community Colleges (PT@CC), serving as its executive committee chair during 2004. That same year, he also received the Two-Year College Teaching Award given by the Society for the Teaching of Psychology. Bob has long been active in APA, APS, the Western Psychological Association, and the Council of Teachers of Undergraduate Psychology.

Vivian McCann, a senior faculty member in psychology at Portland Community College in Portland, Oregon, teaches a wide variety of courses, including introductory psychology, human relations, intimate relationships, personality, and social psychology. Born and raised in the California desert just 10 miles from the Mexican border, she quickly learned the importance of understanding cultural backgrounds and values in effective communication, which laid the foundation for her lifelong interest in teaching and learning psychology from diverse cultural perspectives. Vivian loves to explore new cultures through travel, and to nurture the same interests in her students. She has led groups of her students on four trips abroad, and in her own travels has visited 35 countries so far. Her most recent adventure took her to Africa for four months, where she volunteered with women in Tanzania, worked with elephants and endangered rhinos in Zimbabwe, and trekked into the mountains of Rwanda to observe gorillas in the wild. Vivian maintains a strong commitment to teaching excellence and has developed and taught numerous workshops in that area. She has served on the APA's executive committee for Psychology Teachers at Community Colleges (PT@CC) and is an active member of the Western Psychological Association and APS. She is also the author of *Human Relations: The Art and Science of Building Effective Relationships*. Her most recent passion involves working with The Heroic Imagination Project, a non-profit organization dedicated to teaching people of all ages to stand up, speak out, and develop their own inner heroes in pursuit of a more compassionate world.

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Chapter 1

Mind, Behavior, and Psychological Science

Does sugar really make kids hyper? Using Use psychology to find out.

Core Concepts

1.1 Psychology is a broad field, with many specialties, but fundamentally psychology is the science of behavior and mental processes.

1.2 Six main viewpoints dominate modern psychology—the biological, cognitive, behavioral, whole-person, developmental, and sociocultural perspectives—each of which grew out of radical new concepts about mind and behavior.

1.3 Psychologists, like all other scientists, use the scientific method to test their ideas empirically.

"After the kids had all that sugar—the cake, ice cream, punch, and candy—they were absolutely bouncing off the walls!" said one of our friends who was describing a birthday party for her 8-year-old daughter.

I must have had a skeptical look on my face, because she stopped her story short and asked, "You don't believe it?" Then she added, "You psychologists just don't believe in common sense, do you?"

I responded that what people think of as "common sense" can be wrong, reminding her that common sense once held that Earth was flat. "Perhaps," I suggested, "it might be wrong again—this time about the so-called sugar high people think they observe.

"It could have been just the excitement of the party," I added.

"*Think* they observe?" my friend practically shouted. "Can you *prove* that sugar doesn't make children hyperactive?"

"No," I said. "Science doesn't work that way. But what I *could* do," I ventured, "is perform an experiment to test the idea that sugar makes children 'hyper.' Then we could see whether your claim passes or fails the test."

My timing wasn't the best for getting her involved in a discussion of scientific experiments, so let me pose the problem to you.

CHAPTER PROBLEM: How would psychology test the claim that sugar makes children hyperactive?

We invite you to think about how we might set up such an experiment. We could, for example, give kids a high-sugar drink and see what happens. But because people often see only what they expect to see, our expectations about sugar and hyperactivity could easily influence our observations. So how could we design an experiment about sugar and hyperactivity that also accounts for our expectations? It is not an easy problem, but we will think it through together, and by the end of this chapter, you will have the tools you need to solve it.

Every chapter in this book will begin with a problem such as this—a problem aimed at getting you actively involved in learning psychology and thinking critically about some important concepts in the chapter. Solving the problem with us, rather than just passively reading the words, will make the concepts more meaningful to you and more easily remembered (which we know is true, thanks to research on the psychology of memory).

The important concept illustrated by the "sugar high" problem is one of the most fundamental concepts in all of psychology: using the *scientific method* to explore the mind and behavior. But before we get into the details of the scientific method, let's clarify what we mean by the term *psychology* itself.

Key Question: What Is Psychology—and What Is It *NOT*?

Core Concept 1.1

Psychology is a broad field, with many specialties, but fundamentally psychology is the science of behavior and mental processes.

"I hope you won't psychoanalyze me," says the student at the office door. It is a frequent refrain and an occupational hazard for professors of psychology. But students need not worry about being psychoanalyzed, for two reasons. First, not all psychologists diagnose and treat mental problems—in fact, those who do are actually in the minority among professors of psychology. Second, only a few psychologists are actually *psychoanalysts.* The term **psychoanalysis** refers to a highly specialized and relatively uncommon form of therapy. You will learn more about the distinction between psychologists and psychoanalysts later in the chapter—but, in the meantime, don't fret that your professor will try to find something wrong with you. In fact, your professor is much more likely to be interested in helping you learn the material than in looking for signs of psychological disorder.

So, you might wonder, if psychology is not all about mental disorders and therapy, what *is* it all about?

The term **psychology** comes from *psyche,* the ancient Greek word for "mind," and the suffix *-ology,* meaning "a field of study." Literally, then, *psychology* means "the study of the mind." Most psychologists, however, use the broader definition given in the core concept for this section:

> Psychology is a broad field, with many specialties, but fundamentally psychology is the science of behavior and mental processes.

One important point to note about this definition: Psychology includes not only *mental processes* but also *behaviors.* In other words, psychology's domain covers *internal* mental processes that we observe only indirectly (such as thinking, feeling, and desiring), as well as *external,* observable behaviors (such as talking, smiling, and running). A second important part of our definition concerns the *scientific* component of psychology. In brief, the science of psychology is based on objective, verifiable evidence—not just the opinions of experts and authorities, as we often find in nonscientific fields. We will give a more complete explanation of the science of psychology later in this chapter. For now, though, let's take a closer look at what psychologists actually do.

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

1.1 Describe the different specialties that comprise psychology

1.2 Distinguish psychology from pseudo-psychology

1.1: Psychology: It's More Than You Think

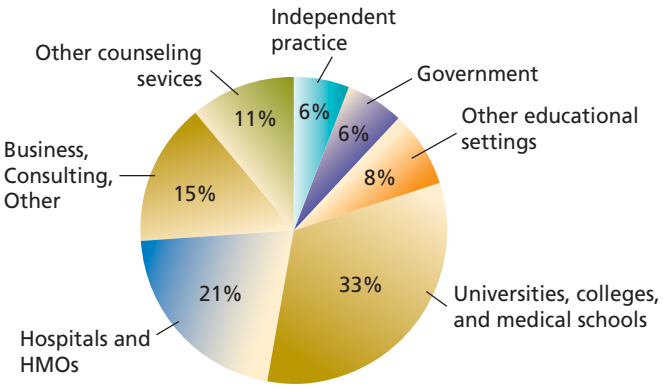
Objective: Describe the different specialties that comprise psychology

Psychology covers more territory than most people realize. As we have seen, not all psychologists are therapists. Many work in education, industry, sports, prisons, government, churches and temples, private practice, human relations, advertising, and the psychology departments of colleges

and universities. Others work for engineering firms, consulting firms, and the courts (both the judicial and the NBA variety) (see Figure 1.1).

Figure 1.1 Work Setting of Psychologists

Psychologists work in a broad variety of industries and work places.



In these diverse settings, psychologists perform a wide range of tasks, including teaching, research, testing, and equipment design—as well as psychotherapy. In fact, psychology's specialties are too numerous to cover them all here, but we can give you a taste of the field's diversity by first dividing psychology into three broad groups.

1.1.1: Three Ways of Doing Psychology

Broadly speaking, psychologists cluster into three main categories:

1. *Experimental psychologists*
2. *Teachers of psychology*
3. *Applied psychologists*

Some overlap exists among these groups, however, because many psychologists take on multiple roles in their work.

Experimental psychologists (sometimes called *research psychologists*) constitute the smallest of the three groups. Nevertheless, they perform most of the research that creates new psychological knowledge (Frincke & Pate, 2004).[1] For example, an experimental psychologist would be well equipped to study the effects of sugar on hyperactivity in children. While some experimental psychologists can be found in industry or private research institutes, the majority work at a college or university, where most also teach.

[1]Throughout this text, you will find citations in parentheses, calling your attention to a complete bibliographic reference found in the references section at the end of the book. These brief in-text citations give the authors' last names and the publication date. When you have the complete references in hand, your library can help you find the original source.

Teachers of psychology can be found at universities, 2-year and 4-year colleges, and high schools. Traditionally, university and college teachers are also required to engage in research and publication, so they serve in a dual role as both teachers of psychology and experimental psychologists. At community colleges, teachers of psychology focus more exclusively on teaching, although some do conduct a limited amount of research as well (typically as a secondary pursuit). Teachers at high schools rarely—if ever—are required to conduct research (American Psychological Association, 2007; Johnson & Rudmann, 2004).

Applied psychologists use the knowledge developed by experimental psychologists to tackle human problems of all kinds, such as toy or equipment design, criminal analysis, and psychological treatment. They work in a wide variety of places, ranging from schools, clinics, and social service agencies to factories, airports, hospitals, and casinos. All told, about two-thirds of the doctoral-level psychologists in the United States work primarily as applied psychologists (Wicherski and others, 2009).

1.1.2: Applied Psychological Specialties

Some of the most popular applied specialties include:

- ***Industrial and organizational psychologists*** (often called *I/O psychologists*) specialize in personnel selection, talent management, and in tailoring the work environment to maximize both productivity and morale. One of the fastest-growing fields of psychology, I/O psychologists work for companies both large and small around the world. They may, for example, develop programs to motivate employees or to improve managers' leadership skills. I/O psychologists also conduct market research, provide employee and management coaching, conduct employee satisfaction surveys, and help employees create a better balance between work and their personal lives (Novotney, 2011; Shrader, 2001).
- ***Sports psychologists*** help athletes improve their performance by planning effective practice sessions, enhancing motivation, and learning to control emotions under pressure. Some focus exclusively on professional athletes, and others work with recreational athletes. Still others work with individuals for whom physical activity is a key element of their job, such as firefighters or certain military personnel. In all of these cases, the goal of the psychologist is to help their clients maximize their performance by overcoming whatever psychological barriers may be present. Sports psychologists may also conduct research to better understand the relationship between psychology and performance—for example, by studying how various types of personalities may increase interest in

high-risk endeavors such as firefighting, parachuting, or scuba diving.

- ***School psychologists*** are experts in teaching and learning. They deal with issues impacting learning, family or personal crises influencing school performance, or social conditions such as gangs, teen pregnancy, or substance abuse. They sometimes diagnose learning or behavioral problems and work with teachers, students, and parents to help students succeed in school. Many school psychologists work for school districts, where their work includes administering, scoring, and interpreting psychological tests.
- ***Clinical and counseling psychologists*** help people work through difficult choices in relationships, careers, or education to improve social and emotional adjustment. Almost half of all doctoral-level psychologists list clinical or counseling psychology as their specialty (Wicherski and others, 2009).
- ***Forensic psychologists*** provide psychological expertise to the legal and judicial system. One of the most recently recognized specialties in psychology, forensic psychology has gained rapid popularity due in part to such TV shows as *Criminal Minds* and *CSI.* And, while a real day in the life of forensic psychologists may not be as glamorous or fast paced as their television counterparts', the field is burgeoning with opportunities. Forensic psychologists may test inmates in prisons or forensic hospitals to determine readiness for release or fitness to stand trial, evaluate testimony in cases of rape or child abuse, or help with jury selection (Clay, 2009b; Huss, 2001).
- ***Environmental psychologists*** aim to improve human interaction with our environment. They may, for example, study the impact of inner-city garden spaces on children's academic performance or determine ways to encourage environmentally friendly behavior such as recycling. In private practice, environmental psychologists sometimes help clients maintain their commitment to sustainability or conduct workshops teaching people the mental health benefits of interacting with nature (Novotney, 2009).
- ***Geropsychologists*** make up one of the newest fields of psychology. With the rapidly increasing population of adults over 65 in the U.S., the American Psychological Association established professional geropsychology to help older adults maintain their health and wellness and cope effectively with age-related challenges. Geropsychologists conduct assessments, provide interventions, and consult with families, caregivers, and medical professionals to help older adults maximize their potential in the later stages of life.

More information on career possibilities in psychology can be found in *Careers in Psychology*, published by the American Psychological Association (2011a) and available online.

1.1.3: Psychology Is Not Psychiatry

Just as beginning psychology students may think all psychologists are clinical psychologists, they also may not know the distinction between *psychology* and *psychiatry*. So let's clear up that confusion, just in case you encounter a test question on the topic.

Virtually all psychiatrists, but only some psychologists, treat mental disorders—and there the resemblance ends. **Psychiatry** is a medical specialty, not part of psychology at all. Psychiatrists hold MD (Doctor of Medicine) degrees and, in addition, have specialized training in the treatment of mental and behavioral problems, typically with drugs. Therefore, psychiatrists are licensed to prescribe medicines and perform other medical procedures. Consequently, psychiatrists tend to treat patients with more severe mental disorders (such as schizophrenia) and also to view patients from a *medical* perspective, as persons with mental "diseases."

By contrast, psychology is a much broader field that encompasses the whole range of human behavior and mental processes, from brain function to social interaction and from mental well-being to mental disorder. For most psychologists, graduate training emphasizes research methods, along with advanced study in a specialty such as those listed earlier. Moreover, while psychologists usually hold doctoral degrees, their training is not usually *medical* training, and thus they are not generally licensed to prescribe medications. Recently, however, a few states have passed legislation to allow qualified psychologists to prescribe certain medications, subject to completing some advanced training and certification (APA, 2014). In summary, then, psychologists work in a wide variety of fields, all of which view people from a *psychological* perspective. This perspective is illustrated by clinical and counseling psychologists, who are likely to view the people they are helping as clients rather than as patients.

So, now you know that psychiatry is not psychology. Next, we'll look at something else that often gets confused with psychology: **pseudo-psychology**.

1.2: Thinking Critically About Psychology and Pseudo-Psychology

Objective: **Distinguish between psychology and pseudo-psychology**

Popular movies such as *Lucy* and the *X-Men* series continue a long tradition of entertainment that thrives on viewers' fascination with claims of mysterious powers of the mind and supernatural influences on our behavior.

Your daily horoscope does the same thing—never mind that astrology has been thoroughly debunked (Schick & Vaughn, 2001). Neither is there any factual basis for graphology (the bogus science of handwriting analysis), fortune telling, or the supposed power of subliminal messages to make us buy things. All these fall under the heading of **pseudo-psychology**: unsupported psychological beliefs masquerading as scientific truth.

The supernatural powers of the X-Men's Professor X, played here by Sir Patrick Stewart, may be fun to imagine—but have no basis in science.

Certainly paranormal claims and horoscopes can be fun as pure entertainment, but it is important to know where reality ends and fantasy begins. After all, you wouldn't want to stake an important decision about your health or welfare on false information, would you? Thus, one of the goals of this text is to help you *think critically* when you hear extraordinary claims about behavior and mental processes. And, lest you assume that by "critical thinking" we simply mean you should find ways to criticize, let us clarify what we do mean when we use this important term.

1.2.1: What Is Critical Thinking?

Those who talk about **critical thinking** often find themselves in the position of Supreme Court Justice Potter Stewart, who famously was unable to define pornography but concluded, "I know it when I see it." Like Justice Stewart, your fearless authors (Phil, Bob, and Vivian) cannot offer a definition of critical thinking with which everyone will agree. Nevertheless, we are willing to jump into the fray with a list of six **critical thinking skills** we will emphasize in this text. Each is based on a specific question we believe should be asked when confronting new ideas.

1. What is the source?
2. Is the claim reasonable or extreme?
3. What is the evidence?
4. Could bias contaminate the conclusion?
5. Does the reasoning avoid common fallacies?
6. Does the issue require multiple perspectives?

WHAT IS THE SOURCE? Does the person making the claim have real expertise in the field? Suppose, for example, you hear a newscast on which a politician or pundit declares that juvenile lawbreakers can be "scared straight." The story explains that, in the program, first-time offenders receive near-abusive treatment from felons who try to scare them away from a life of crime with tales of harsh prison life. Such programs have, in fact, been tried in many states of the U.S. and some other countries as well (Petrosino and others, 2013). But does the person making the claim have any real knowledge of the subject? Does the claimant have legitimate credentials, or is he or she merely a self-proclaimed "expert?" One way to find out is to go online and examine the individual's references and standing within the field. Also, find out whether the source has something substantial to gain from the claim. If it's a medical breakthrough, for example, does the claimant stand to make money from a new drug or medical device? In the case of a "scared straight" program, is the source trying to score political points, get votes, or promote a television series?

Scared straight programs may appeal to desperate parents, but research shows they are not effective—in fact, they may actually increase delinquency. Applying our six critical thinking guidelines to this and other popular claims will help you be a smarter and more informed consumer of information.

IS THE CLAIM REASONABLE OR EXTREME? Life is too short to be critical of everything, of course, so the key is to be selective. How? As the famous astronomer Carl Sagan once said about reports of alien abductions, "Extraordinary claims require extraordinary evidence" (Nova Online, 1996). Critical thinkers, then, are skeptical of claims touted as "breakthroughs" or "revolutionary." Certainly, there are occasionally breakthroughs or revolutionary new treatments that work—but they are relatively rare. Most new scientific developments are extensions of existing knowledge. So, claims that conflict with well-established knowledge should raise a red flag. For example, beware of ads that promise to help you quit smoking

or lose weight with little or no effort. In the case of "scared straight" programs or any other quick fix for a difficult problem, remember that simple solutions to complex problems rarely exist.

WHAT IS THE EVIDENCE? This is one of the most important guidelines to critical thinking, and you will learn more about what constitutes scientific evidence elsewhere in this chapter. For now, though, beware of **anecdotal evidence** or testimonials proclaiming the dramatic effects of a new program. These first-hand accounts tend to be quite convincing, so they often lure us into believing them. Testimonials and anecdotes, though—no matter how compelling—are not *scientific evidence.* They merely represent the experiences of a few carefully selected individuals. It would be risky, and perhaps even dangerous, to assume that what seems true for some people must also be true for everyone.

What does the evidence say about "scared straight" programs? Unequivocally, they do not work. In fact, a great deal of scientific evidence indicates that teens exposed to such treatments, on average, subsequently get into *more* trouble than do those not given the "scared straight" treatment (Petrosino and others, 2012). Moreover, the U.S. Department of Justice has strongly cautioned against these programs, emphasizing the harm they cause (Robinson & Slowikowski, 2011).

COULD BIAS CONTAMINATE THE CONCLUSION? Critical thinkers know the conditions under which biases are likely to occur and can recognize common types of bias, many of which we will cover throughout this book. For now, though, let's examine just a few.

The form of bias most applicable to our "scared straight" example is **emotional bias**: Many worried parents continue to contact law enforcement to request that their teens be enrolled in such a program, saying they're at their wits' end and don't know where else to turn. Desperate for help, they rely on popular media and what they see on television for guidance, rather than thinking clearly and seeking alternate programs that do have evidence of success (Yu, 2014). Also, people's general fear of crime and criminals may prompt support for harsh consequences, as evidenced by the recent spate of "three strikes" laws (which mandate a lifetime in prison after three felony convictions).

Another common form of bias is **confirmation bias**, the all-too-human tendency to remember events that confirm our beliefs and ignore or forget contradictory evidence (Halpern, 2002; Nickerson, 1998). For example, confirmation bias explains why people persist in their beliefs that astrology works: They remember the predictions that seemed accurate and forget the ones that missed the mark. Confirmation bias also explains why gamblers have better recollections of their wins than of their losses, or why we persist in thinking a particular object is our lucky charm. Amazingly, recent research reveals that this bias may be partly biological in nature. In a study done before a presidential election, people listened to their favorite politicians making statements that contradicted themselves. Upon hearing the contradictory statement, brain circuits associated with reasoning in the listeners suddenly shut down, while brain regions most involved with emotion remained active (Shermer, 2006; Westen and others, 2006). It was as though the brain was saying, "I don't want to hear anything that conflicts with my beliefs." Thus, we may have to exert extra effort and diligence to overcome this bias.

DOES THE REASONING AVOID COMMON FALLACIES? We will study several common logical fallacies in this book, but the one most applicable to the "scared straight" example is the assumption that common sense is a substitute for scientific evidence. In fact, in many cases common sense exists to support both sides of an issue. For example, we hear that "Birds of a feather flock together"—but we also hear that "Opposites attract." Similarly, we are told that "The early bird gets the worm," but aren't we also cautioned that "Haste makes waste?" Which, then, is true? Only an examination of the evidence can reliably provide the answer.

A second example of a logical fallacy is when we assume that, because two things are related, once must cause the other. This is known as the **correlation-causation fallacy**. For example, did you know that murder rates rise when people eat more ice cream? It's true—clear data supports the connection. It would be silly, though, to assume that eating ice cream makes people kill each other! (Want to know what's really driving this correlation? Think of something that might influence both ice cream consumption and aggression.) Yet, as humans driven to explain things, we commonly draw these erroneous conclusions when we hear, say, that autism rates have risen as more children have been vaccinated**.** Instead, we must consider alternative interpretations of the relationship and seek additional evidence.

DOES THE ISSUE REQUIRE MULTIPLE PERSPECTIVES? Most behavioral problems and social issues that concern us are complex and need to be viewed from multiple perspectives in order to gain a complete understanding. Critical thinkers, then, know better than to accept a notion that focuses exclusively on one angle. The "scared straight" intervention, for example, makes the simplistic assumption that fear of punishment is the best deterrent to delinquency. A more complete view recognizes additional contributors to delinquency. Psychologists, for example,

may look at delinquency as a product of learned behaviors, social influence, or personality traits. Economists would be interested in the financial incentives for delinquency. And sociologists would focus on such things as gangs, poverty, and community structures. Surely such a multifaceted problem will require a more complex solution than threats of punishment.

Thinking Critically About the Chapter Problem

Before moving on, ask yourself this:

How would you apply these critical thinking guidelines to the chapter-opening problem about whether sugar makes children hyperactive?

1. First, *consider the source.*

   Is the mother of an 8-year-old an expert on biological effects of sugar? Assuming she is not, you'd have to wonder if the source of her belief is a reliable one or if she is just repeating some "common sense" she's often heard but never questioned.

2. Second, *examine the evidence.*

   Have scientific tests been conducted to measure the effects of sugar on children? If so, what have they revealed?

3. Third, *could any biases be at work?*

   The **confirmation bias**, for example, would suggest that we are likely to remember the times our kids had sugar and became hyperactive, and forget or not notice situations when they consumed sugar but it didn't affect them. Also, if we expect children to be hyperactive after consuming sugar, that is likely what we will observe, according to the **expectancy bias.**

4. Fourth, *is the claimant avoiding common fallacies in reasoning?*

   In this case, even if we can prove that kids who consume more sugar are more hyperactive, we can't be sure that sugar is the cause, as the relationship is a correlation (which does not show a cause–effect relationship). Alternatively, perhaps kids who are already hyperactive eat more sugar as a means of maintaining their high need for activity. Or, it's the excitement of the party that prompts the hyperactivity, but the sugar gets the blame. Identifying these possibilities helps overcome the **correlation-causation fallacy.**

5. What other perspectives should be considered?

   Finally, the need to recognize multiple perspectives prompts us to admit that there are probably other reasons kids get excited at parties. For example, parents may allow their children more flexibility in behavior at parties, and the general nature and social norms of children's parties practically requires energetic games.

Do It Yourself!

Psychological Science or Psychobabble?

Now, let's put a sampling of your psychological beliefs to the test. Some of the following statements are true, and some are false. Don't worry if you get a few—or all—of the items wrong: You will have lots of company. The point is that what so-called common sense teaches us about psychological processes may not withstand the scrutiny of a scientific test. Analyze each of the following statements as "true" or "false."

1. _____ It is a myth that most people use only about 10% of their brains.
2. _____ During your most vivid dreams, your body may be paralyzed.
3. _____ Psychological stress can cause physical illness.
4. _____ The color red exists only as a sensation in the brain. There is no "red" in the world outside the brain.
5. _____ Bipolar (manic–depressive) disorder is caused by a conflict in the unconscious mind.
6. _____ The newborn child's mind is essentially a "blank slate" on which everything he or she will know must be "written" (learned) by experience.
7. _____ Everything that happens to us leaves a permanent record in memory.
8. _____ You were born with all the brain cells that you will ever have.
9. _____ Intelligence is a nearly pure genetic trait that is fixed at the same level throughout a person's life.
10. _____ Polygraph ("lie detector") devices are remarkably accurate in detecting physical responses that, in the eye of a trained examiner, reliably indicate when a suspect is lying.

The first four items are true; the rest are false.

Here are some brief explanations for each item. You will learn more detail about each of these myths as you continue your study of psychology.

1. True: This is a myth. We use all parts of our brains every day.
2. True: During our most vivid dreams, which occur during rapid eye movement sleep (REM), the voluntary muscles in our body are paralyzed, with the exception of those controlling our eyes.
3. True: The link between mind and body can make you sick when you are under chronic stress.
4. True: Strange as it may seem, all sensations of color are created in the brain itself. Light waves do have different *frequencies*, but they have no color. The brain interprets the various frequencies of light as different colors.
5. False: There is no evidence at all that unconscious conflicts play a role in bipolar disorder. Instead, the evidence suggests a strong biochemical component. The disorder usually responds well to certain drugs, hinting that it

involves faulty brain chemistry. Research also suggests that this faulty chemistry may have a genetic basis.

6. False: Far from being a "blank slate," the newborn child has a large repertoire of built-in abilities and protective reflexes. The "blank slate" myth also ignores the child's genetic potential.
7. False: Although many details of our lives are remembered, there is no evidence that memory records all the details of our lives. In fact, we have good reason to believe that most of the information around us never reaches memory and that what does reach memory often becomes distorted.
8. False: Contrary to what scientists thought just a few years ago, some parts of the brain continue to create new cells throughout life.
9. False: Intelligence is the result of both heredity and environment. Because it depends, in part, on environment, your level of intelligence (as measured by an IQ test) can change throughout your life.
10. False: Even the most expert polygrapher can incorrectly classify a truth-teller as a liar or fail to identify someone who is lying. Objective evidence supporting the accuracy of lie detectors is meager.

Psychology Matters

Psychology as a Major

By now, you may be thinking, "Hey, psychology sounds pretty interesting. . . . Should I consider majoring in it?" A degree in psychology is useful in many ways, whether you want to become a psychologist or not. The entire goal of psychology is to better understand why people do what they do, so even taking a few classes in psychology will give you insight into yourself and others in your life. Earning an associate's degree or a bachelor's degree in psychology can help prepare you for jobs as a psychological aide or technician in agencies, hospitals, nursing homes, and rehabilitation centers. A bachelor's degree in psychology, coupled with training in business, government, journalism, or education, is also excellent preparation for a career in any of these fields.

Becoming a fully fledged psychologist, though, requires substantial training beyond the bachelor's degree. In graduate school, the psychology student takes advanced classes in one or more specialized areas while developing general skills as a scholar and researcher. A master's degree, typically requiring 2 years of study beyond the bachelor's level, may qualify you for employment as a psychology instructor at the high school or community college level or as an applied psychologist in certain specialties, such as counseling. Master's-level psychologists are common in human service agencies, as well as in private practice (although many states do not allow them to advertise themselves as "psychologists").

The widest range of choices is available to holders of a doctorate (Smith, 2002b), such as a PhD (Doctor of Philosophy), a PsyD (Doctor of Psychology), or an EdD (Doctor of Education). In most states, a license to practice psychology requires a doctorate plus a supervised internship. A doctoral degree also qualifies you for college and university teaching, for research positions, and for many of the specialties such as forensic psychology that we introduced to you earlier in this section. You could even work as a video game researcher, making video games more accessible and fun! Check out the story of one PhD graduate who did just that. http://www.apa.org/science/about/psa/2009/11/careers.aspx

Key Question: What Are Psychology's Six Main Perspectives?

Core Concept 1.2

Six main viewpoints dominate modern psychology—the biological, cognitive, behavioral, whole-person, developmental, and sociocultural perspectives—each of which grew out of radical new concepts about mind and behavior.

The shape of modern psychology has been molded by its history, which dates back some 25 centuries to the Greek philosophers Socrates, Plato, and Aristotle. These sages not only speculated about consciousness and madness; they also knew that emotions could distort thinking and that our perceptions are merely interpretations of the external world. Even today, people would probably agree with many of these ancient conjectures—and so would modern psychology.

But the Greeks get only partial credit for laying the foundations of psychology. At roughly the same time, Asian and African societies were developing their own psychological ideas. In Asia, followers of yoga and Buddhism were exploring consciousness, which they attempted to control with meditation. Meanwhile, in Africa, other explanations for personality and mental disorders were emerging from traditional spiritual beliefs (Berry and others, 1992). It was, however, the Greek tradition and, later, the Catholic Church that most influenced the winding developmental path of Western psychology as a science.

What role did the Church play in shaping the study of psychology? During medieval centuries, for example, clerics actively suppressed inquiry into human nature, partly in an attempt to discourage interest in the "world of the flesh." For medieval Christians, the human mind and soul were inseparable and—like the mind of God—presented a mystery that mortals should never try to solve.

Change of this entrenched viewpoint did not come easily. It took a series of radical new ideas, spaced over several hundred years, to break the medieval mindset and lay

the intellectual foundation for modern psychology—which brings us to our core concept for this section:

> Six main viewpoints dominate modern psychology—the biological, cognitive, behavioral, whole-person, developmental, and sociocultural perspectives—each of which grew out of radical new concepts about mind and behavior.

As we examine these perspectives, you will see that each viewpoint offers its own unique explanation for human behavior. Taken together, they comprise psychology's multiple perspectives, each of which will become an important tool in your "psychological toolbox" for understanding human behavior. To help you see for yourself how useful these perspectives can be, we will apply each one to a problem with which many students struggle: procrastination. Let's begin with the biological perspective.

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

1.3 **Explain the biological perspective**

1.4 **Describe the developmental history of scientific psychology and the modern cognitive perspective**

1.5 **Summarize the psychological perspectives that emerged in the twentieth century**

1.6 **Apply psychology's perspectives to a behavior of your own**

1.3: The Separation of Mind and Body

Objective: **Explain the biological perspective**

The 17th-century philosopher René Descartes *(Day-CART)* proposed the first radical new concept that eventually led to modern psychology: *a distinction between the spiritual mind and the physical body*. The genius of Descartes' insight was that it allowed the Church to keep the mind off limits for scientific inquiry, while simultaneously permitting the study of human sensations and behaviors because they were based on physical activity in the nervous system. His proposal fit well with exciting new discoveries about biology, in which scientists had just learned how the sense organs of animals convert stimulation into nerve impulses and muscular responses. Such discoveries, when combined with Descartes' separation of mind and body, allowed scientists to demonstrate that biological processes, rather than mysterious spiritual forces, caused sensations and simple reflexive behaviors.

1.3.1: The Modern Biological Perspective

Four hundred years later, Descartes' revolutionary perspective provides the basis for the modern **biological perspective**. No longer constrained by the dictates of the medieval Church, however, modern biological psychologists have rejoined mind and body (although they leave issues of the soul to religion), and now view the mind as a product of the brain.

In this current view, our personalities, preferences, behavior patterns, and abilities all stem from our physical makeup. Accordingly, biological psychologists search for the causes of our behavior in the brain, the nervous system, the endocrine (hormone) system, and the genes. Procrastination, from this perspective, may result from a certain type of brain chemistry (Liu and others, 2004), which could be inherited. While they don't deny the value of other perspectives on mind and behavior, biological psychologists aim to learn as much as possible about the physical underpinnings of psychological processes.

The biological perspective in psychology looks for causes of human behavior in our brain and nervous system. The fields of neuroscience and evolutionary psychology are both offshoots of the biological perspective.

1.3.2: Two Variations on the Biological Theme

As you might imagine, the biological view has strong roots in medicine and biological science. In fact, the emerging field of **neuroscience** combines biological psychology with biology, neurology, and other disciplines interested in brain processes. Thanks to spectacular advances in computers and brain-imaging techniques, neuroscience is a hot area of research. Among their achievements, neuroscientists have learned how damage to certain parts of the brain can