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DISCOVERING PSYCHOLOGY

THE SCIENCE OF MIND | 3E

JOHN T. CACIOPPO | LAURA A. FREBERG

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Discovering Psychology 3e

THE SCIENCE OF MIND

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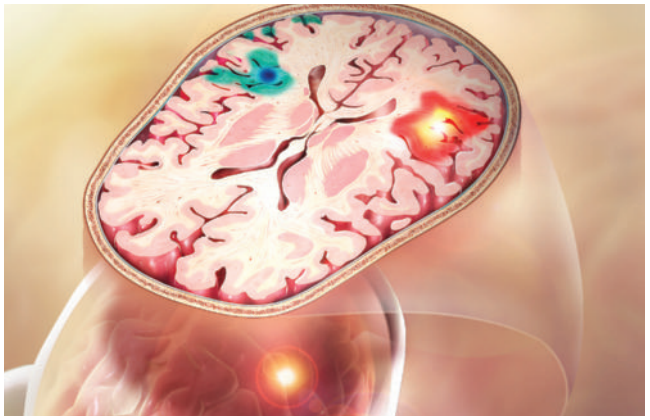

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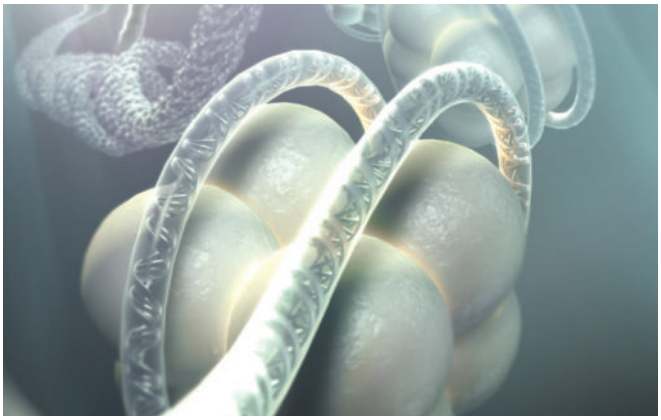

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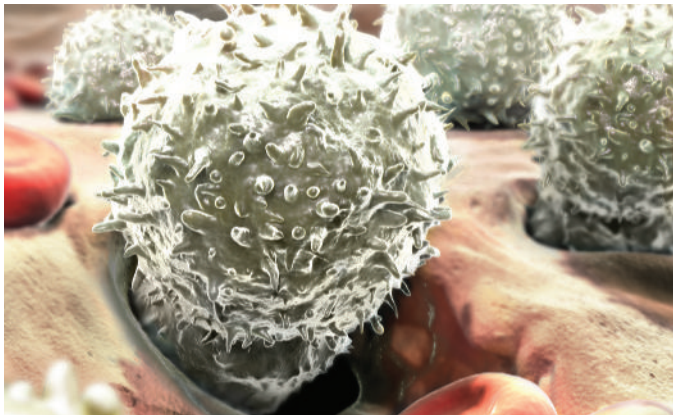

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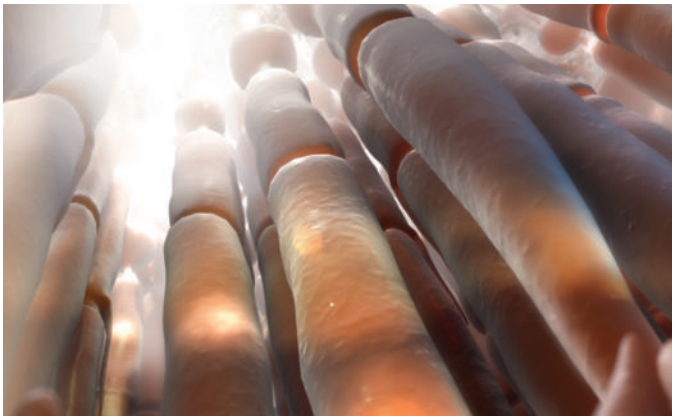

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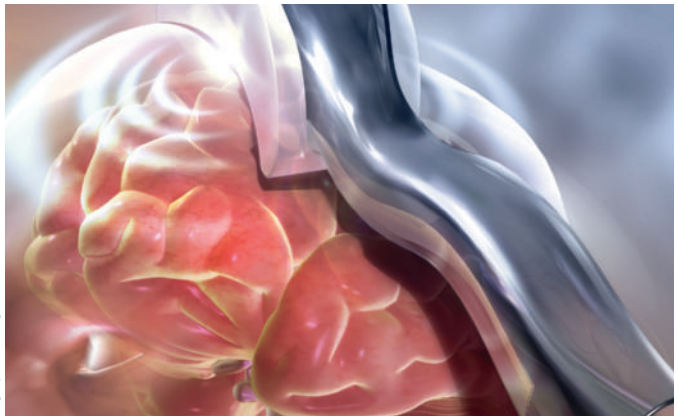

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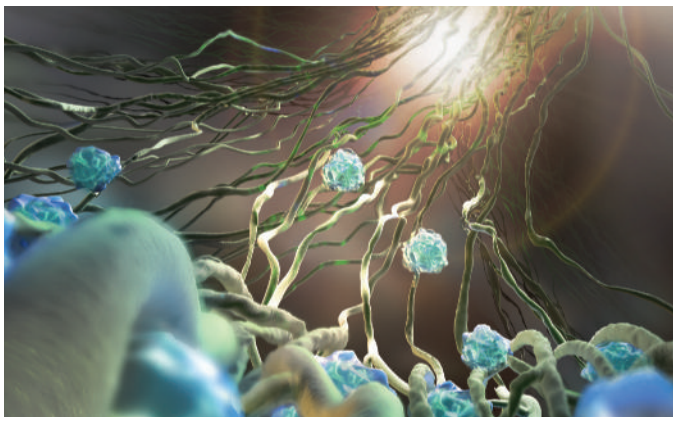
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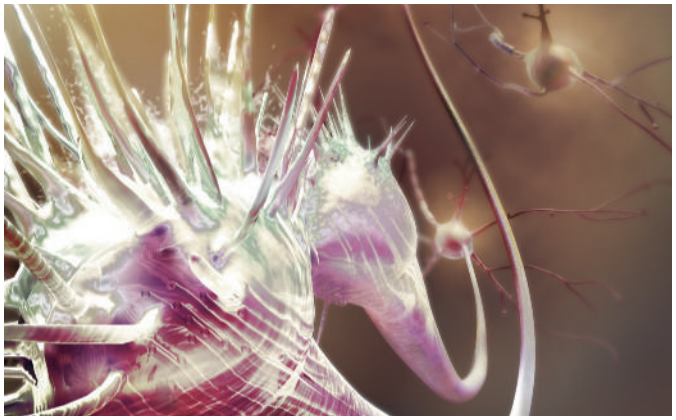

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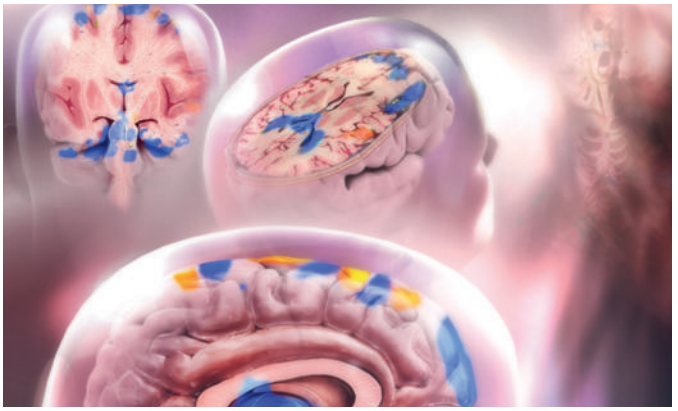

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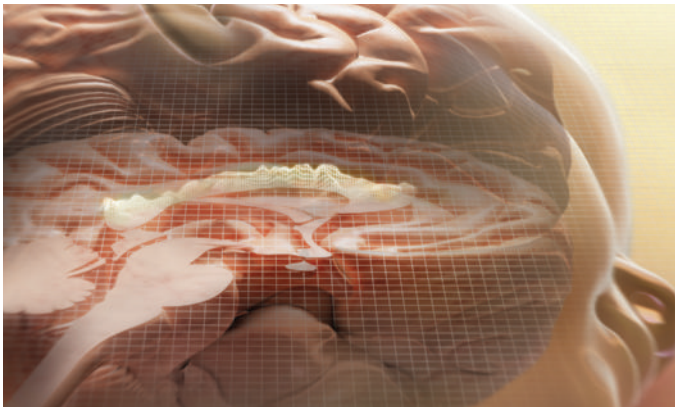

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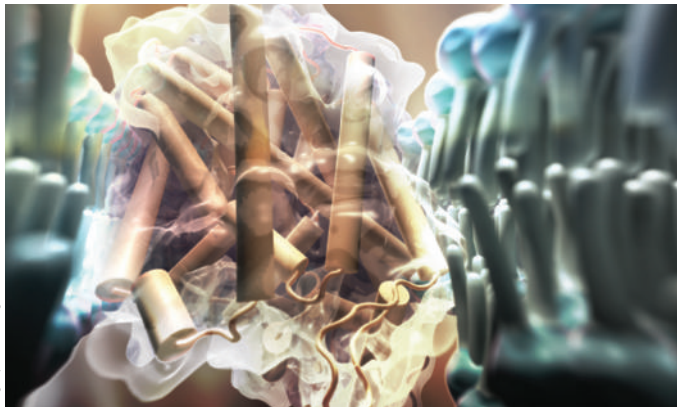

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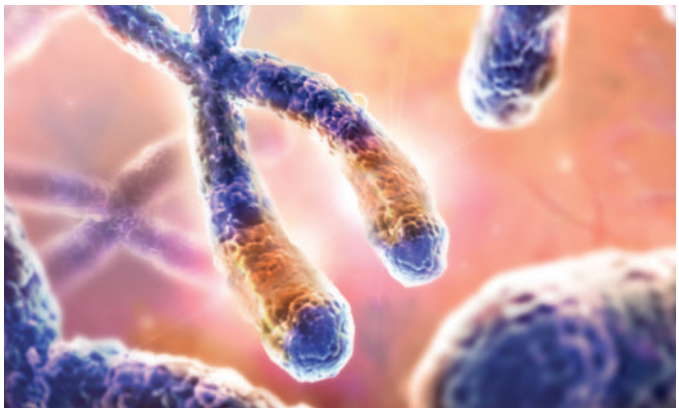

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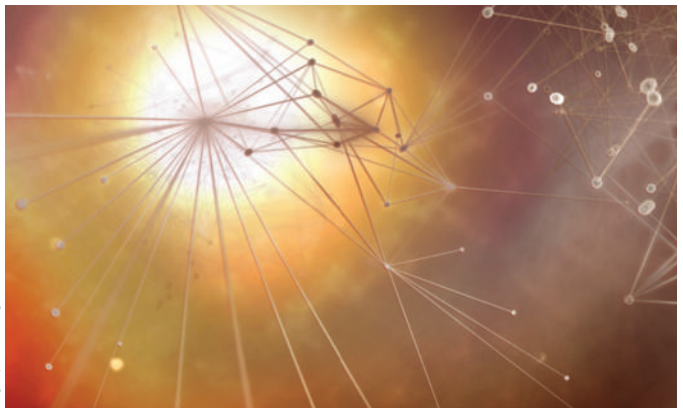

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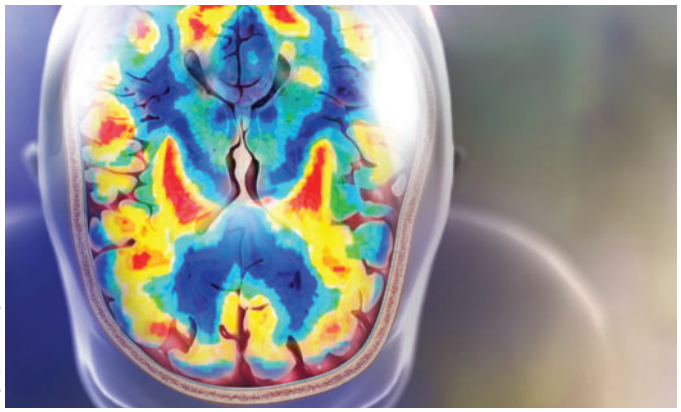

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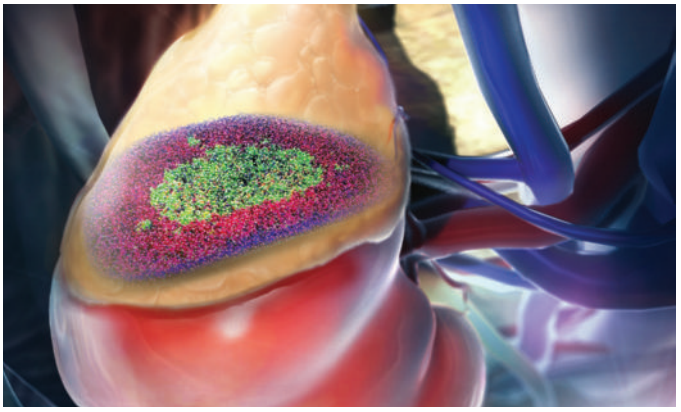

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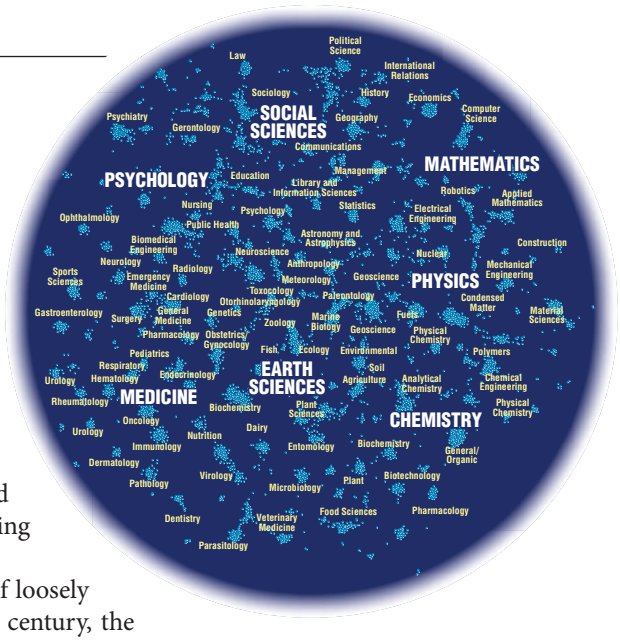
Preface



With *Discovering Psychology: The Science of Mind,* we sought to produce a textbook that reflects psychological science as a hub science—a discipline whose work provides foundational material for many other scientific fields and a wide range of applications. Psychological science is also inherently interdisciplinary, and we sought to write a textbook that presents psychology not as a series of isolated areas of inquiry, but as an integrated science of mind. Contemporary psychological science is also a global affair, and we sought to produce a textbook that draws on evidence from diverse samples of healthy participants and patients, as well as studies of animals. These goals and our implementation of them resonated with both instructors and students using our previous editions, and we have honed this mission in our third edition.

The science of psychology developed in the 20th century as a collection of loosely organized, independent subspecialties. Now, in the second decade of the 21st century, the discipline is moving rapidly toward maturity as an integrative, multidisciplinary science. Not only are psychologists forming rich collaborations with scholars in other fields, from medicine to business to education to law, but we are returning to original conceptions of psychology put forward by thinkers such as William James, who sought a complete understanding of the human mind and was not content to view psychology from narrow, isolated perspectives. We share a mutual excitement about this evolution of psychological science, and we marvel at the speed at which new developments are emerging in the theory, methods, and applications of psychological science. The third edition is designed to capture some of the most important developments that have emerged in recent years.

For many years, the introductory psychology course has served primarily as a jumping-off point for advanced courses in the field, and the textbooks prepared to support the course have reflected this goal. Each chapter in these conventional textbooks provided a capsule of stand-alone information designed to acquaint students with the terminology and hypotheses of a single psychological perspective. Human behavior is influenced by factors across multiple perspectives, however. We see our introductory textbook as providing a unique opportunity to discuss *all* of psychology, in one place and at one time. This approach allows us to reflect on the intersections among various perspectives as they inform the whole of our understanding of the human mind. Given that most students in our introductory classes will take only this one course in the field, we have a responsibility to provide a comprehensive structure that will support their lifelong learning and understanding of human behavior.

We see the introductory course as providing a unique opportunity to discuss all of psychology in one place and at one time.

Our goal is to engage our students in the fascinating, integrated discipline of psychological science as it exists in the 21st century, and we view the third edition of *Discovering Psychology: The Science of Mind* as another plank in the bridge toward this goal. The structure of the bridge is a traditional chapter organization. The piers on which the bridge rests are the foundational theories of the discipline developed in the late 19th, 20th, and early 21st centuries. The steel beams of which the bridge is composed consist of the theories and research painstakingly developed throughout the 20th century until today, and the rivets, trusses, and tie rods that hold the bridge together are integrative themes that have been reinvented in the past decade or so. Finally, the smooth roadbed that transports students across the bridge is a clear, inviting, warm, and lively writing style and visual narrative.

As active instructors in the introductory psychology classroom, we recognize the balance that busy faculty members must find between their preparation for class and their many other duties. Our intent is to make the transition to a 21st-century textbook as seamless and effortless as possible for faculty and students alike. Our discussions of complex and emerging issues, such as epigenetics, include sufficient information and explanation to provide a sense of mastery. Clear writing, frequent examples, visual narratives, and engaging pedagogy energize students and provide the support needed for success. After completing the course, students will be able to appreciate the distinction between how laypeople and psychologists think about human behavior.

As citizens of the 21st century, community leaders, and influencers, college graduates will need a firm foundation in the understanding of human behavior and critical thinking to confront successfully the myriad issues of privacy, genetic manipulation, free will, human dignity, health, and well-being that will face them in the future. This third edition of *Discovering Psychology: The Science of Mind* is designed to provide that foundation.

Our Integrative and Functionalist Approach

Early writings about psychology were integrated and inclusive. Diverse elements of behavior were combined into the whole. William James (1890) cautions us about the risks of missing the big picture by breaking the phenomenon of mind into little pieces. Mental life for James was not an entity that can be "chopped up in bits" (p. 233). Despite the long-lived popularity of his dominant psychology textbook, James did not prevail. Psychology soon split into camps of scholars who viewed behavior and mental life through their own single, narrow perspectives, rarely speaking with those who held different views and producing curricula and textbooks that emphasized the parts rather than the whole. There are good reasons for specialization in science, but introductory psychology provides an opportunity to put these pieces back together. Doing so shows students how much our notions have changed regarding how the mind and behavior work, and how much this understanding can improve their lives.

As psychological science became increasingly siloed in the 20th century, its origins in the late 19th century as a unified whole were forgotten. In 20th-century introductory psychology textbooks, the writings and experiments of Wilhelm Wundt, Edward Titchener, and James are described as the discipline's prehensile tail, long ago lost and interesting only from a historical perspective. The organization of the study of mind into separate, disconnected chapters not only transformed the topics of psychology into islands without bridges, but actually built barriers to students' understanding of the connectedness among them. A memory cannot be fully understood from one isolated point of view; only when the social and personality, cognitive, biological and evolutionary, developmental, and clinical perspectives are combined can it be thoroughly grasped. James (1890, vol. 1, p. 1) warns us that when mental phenomena are "superficially considered, their variety and complexity is such as to leave a chaotic impression on the observer." This confusion, unfortunately, is the legacy for many of our students exposed only to outdated textbooks in psychology.

Breaking from the approach of other textbooks, we reflect throughout our text on the integrative influences of the founders in our functionalist approach to the material. We seek not only to describe behavior, but also to answer questions about why a particular behavior occurs. Viewed through this lens, behavior is neither random nor unexplainable, and it shifts into focus when we consider its goals and functions. For example, people do not just experience feelings of loneliness; instead, loneliness acts as a warning signal to remind us of the importance of social connectedness.

Integration in this textbook extends in two directions, both within psychology and between psychology and other disciplines. We hope to highlight for students the many connections within the discipline of psychology, as well as its connections with other disciplines.

Our book is subtitled *The Science of Mind,* and unlike other contemporary texts with their occasional references to *mind,* the word appears in each of the chapter titles, highlighting the scientific study of the nature and behavior of the theoretical construct of the mind. Throughout the book, we emphasize the relationship between rigorous scientific methods and observations, as well as the implications of these observations for competing theories about the structure and operations of the human mind.

Implementing the Goals of Integration

Many introductory psychology textbooks are marketed as "integrated," but saying that you are integrated and actually implementing integration are two different things. We have spent a great amount of time and effort discussing ways to provide a truly integrated presentation of the science of mind.

Integration in this textbook extends in two directions, both within psychology and between psychology and other disciplines. We hope to highlight for students the many connections within the discipline of psychology, as well as its connections with other disciplines. Many introductory psychology textbooks share our goal of providing integration, but we would like to make our methods of achieving this goal explicit:

1. Within the body of each chapter, we make frequent connections to material in other chapters, forming bridges that connect subtopics. In the electronic version of the textbook, these connections will be hyperlinked for the convenience of the reader. For example, in a discussion of the causes of anxiety disorders in our chapter on psychological disorders (Chapter 14), we say:

   > A reasonable place to start looking for correlates of anxiety in brain structure and function is the fear circuit involving the amygdala, which we discussed in Chapters 4 and 7. The amygdala is particularly rich in receptors for GABA, a neurotransmitter that inhibits brain activity. As discussed in Chapter 6, drugs such as alcohol and the benzodiazepine tranquilizers (e.g., Valium) have their main anxiety-reducing effects at these GABA receptors.

2. We use frequent examples from other parts of the discipline to illustrate principles within a chapter. For example, when we discuss latent inhibition in our chapter on learning (Chapter 8), we illustrate that principle by linking to clinical research about latent inhibition, creativity, and schizophrenia and to social psychology research on prejudice.
3. We specifically identify and explore five integrative perspectives that weave the standard topics more closely together: social and personality psychology, cognition, biology and evolution, development, and clinical psychology. The need to consider major perspectives in psychology was reinforced in a report titled "Strengthening the Common Core of the Introductory Psychology Course," published in 2014 by the American Psychological Association (APA Board of Educational Affairs Working Group, 2014). In keeping with the standard organization of introductory psychology textbooks, the fundamentals of these perspectives are covered in distinct chapters, but the threads of each perspective are woven into all the chapters. These perspectives are explained in greater detail in the following section.
4. Each chapter includes eight features, which are described in more detail in a later section: Chapter Opener, Psychology as a Hub Science, Experiencing Psychology, Thinking Scientifically, Connecting to Research, Perspectives on Interpersonal Relationships, Diverse Voices in Psychology, and Psychology Takes on Real-World Problems. These features are designed to promote active learning and to increase student interest. Four of these in particular (Chapter Opener, Perspectives on Interpersonal Relationships, Psychology Takes on Real-World Problems, and Psychology as a Hub Science) also contribute to our integrative approach. In the chapter openers, we show how multiple psychological perspectives address a phenomenon by zooming in to see the biological approach and then zooming out again to gain insight from the developmental, cognitive, individual difference, social, and clinical perspectives. Each Perspectives on Interpersonal Relationships feature shows how a particular perspective colors questions about successful relationships, so by the end of the textbook, the student can see how integrating 16 approaches to a single issue enriches our understanding of a psychological phenomenon. Psychology Takes on Real-World Problems tackles the issue of cyberbullying, highlighting research relevant to each chapter that can be applied to understanding cyberbullying and developing thoughtful policy. The Psychology as a Hub Science features address the larger integration picture of where psychology stands in the context of the scientific community.

Integrative Features in Detail

Extensive literature supports the idea that an engaged and cognitively active student is more likely to master content. Although students are accustomed to textbooks, their approaches to learning have been affected by technologies that transfer information at an ever-increasing

pace, with a strong emphasis on rapidly presented visual images. Consequently, it becomes all too easy to go through the motions of reading a text without really thinking about what they have read. We have incorporated the following six features, designed to model good textbook-reading practices in students while maintaining a high level of interest and understanding.

Chapter Opener To introduce and engage interest in upcoming chapter material, many textbooks use a vignette or case study, accompanied by either a fine art piece or a photo that is not discussed further. We begin each chapter with a combination of two images—one gives the big picture, and the other gives the microview of the same topic. The chapter opener guides the student through the significance of the images. We use the terms *zoom in* and *zoom out* to emphasize the need to understand the underpinnings of a psychological phenomenon without losing the impact of its larger context. For example, in the biological psychology chapter (Chapter 4), the opening images show a woman accompanying two friends (zoom out) and a beautiful image of a white blood cell exiting bone marrow (zoom in). Does the woman feel like part of a group of friends, or does she feel left out? Depending on how she perceives her social situation, biological cascades are set in motion that prepare her immune system for fighting either the viruses found in close social contact or the bacteria that might be more of a risk when a person is solitary. The reader is drawn into the reciprocal relationships that exist between biology and behavior.

The integrative hub feature broadens the discussion of a psychological topic to include ways in which it is engaged in cooperative science with other disciplines, from medicine to the social sciences.

Psychology as a Hub Science This integrative feature broadens the discussion of a psychological topic to include ways in which psychology engages in cooperative science with other disciplines, from medicine to the social sciences. It is accompanied by a graphic adapted from a citation analysis by Boyack, Klavans, and Börner (2005) that shows psychology citations as nodes with connections to other related disciplines. Tailored to each of the 16 features, this graphic highlights the connections between psychology and the relevant disciplines of psychiatry, nursing, public health, emergency medicine, pharmacology, computer science, law, education, management, and the other social sciences. Given these connections, psychology has a central role to play in our efforts to deal with economic collapses, the spread of pandemics, energy conservation, the spread of terrorism, rising health care costs, and our crumbling educational system. For example, cardiovascular disease is surely a medical condition, but contemporary scientists recognize that a full understanding of this killer requires consideration of psychological domains, including stress appraisal, reactivity to stressors, individual resilience, and a person's social context. Seeing the impact of psychology on many disciplines makes the introductory course relevant for students of all majors, as well as rekindling some "psych pride" in those of us in the field.

Experiencing Psychology This interactive feature provides ways for students to connect the course material to their own lives and interests. Some hands-on examples are the Epworth Sleepiness Scale in the consciousness chapter (Chapter 6), Coren's handedness scale in the biological psychology chapter (Chapter 4), the BFI-10 personality test in the chapter on personality and the self (Chapter 12), and the Hypersensitive Narcissism Scale in the chapter on psychological disorders (Chapter 14). In other cases, this feature provides longer-term opportunities for students to apply their learning, such as working to reduce the frequency of a bad habit (Chapter 8).

Thinking Scientifically This interactive feature models critical thinking skills for students by providing them with opportunities to critique the progress of science. For example, in the chapter on research methods (Chapter 2), students review the current controversies about replication in psychology. In the chapter on psychological treatments (Chapter 15), students are asked to evaluate the use of mobile technologies to help children with autism spectrum disorder (ASD).

Connecting to Research To emphasize psychology as a science, this feature explores either a classic or a contemporary study relevant to the chapter's material and comments on its significance to the field. Sections on the question, methods, ethics, results, and conclusions provide a guided introduction for the student to the essentials of the peer-reviewed literature. From Wundt's classic studies of reaction time, to the discovery of mirror neurons, to

distinctions between romantic love and lust in the brain, students are given insight into what psychological scientists do.

Perspectives on Interpersonal Relationships In keeping with the integrative mission of this textbook, the goal of this feature is to demonstrate how the information in a particular chapter can be applied to a single topic—building and maintaining important relationships. This issue is personally meaningful to college students, especially first-year students, and it applies across the board—regardless of gender, race, age, ethnicity, sociocultural background, sexual orientation, or level of academic preparation. The feature has two main purposes: (1) to engage and maintain student interest throughout the text and (2) to stitch together into an integrative, thematic quilt the patchwork of traditional introductory psychology topic areas.

Diverse Voices in Psychology The American Psychological Association (APA) report on best practices for introductory psychology (Gurung et al., 2016) emphasized the inclusion of culture and diversity as a "cross-cutting theme" (p. 112). Although we concur with Trimble, Stevenson, and Worell (2003; see later discussion in this forward) regarding the need to integrate diversity across topics in an organic way, which guided all three editions of this textbook, we thought additional in-depth discussions would be useful. This feature, new to the third edition, explores timely topics such as the shooter bias (Chapter 13) and culturally competent counseling and psychotherapy (Chapter 15).

Psychology Takes on Real-World Problems Introductory psychology courses provide a unique opportunity to not only prepare students for continued study in psychology, but also to provide tools to majors and nonmajors alike that can be used to tackle significant human problems. Once again taking a cue from the APA's introductory psychology report, we have incorporated aspects of the "Big Problems" activity described in the report's appendix into this feature, which is new in the third edition. We selected the topic of cyberbullying, which is not only very common and familiar to today's students, but often results in a number of significant psychological outcomes. Each chapter highlights ways in which its material can be used to address the causes of and solutions to the cyberbullying problem, emphasizing the practical significance of psychological science and encouraging students to apply their learning to policy evaluation and change.

Integrative Perspectives in Detail

The separate perspectives taken by psychologists are reviewed for students in the context of the historical discussion in Chapter 1. In each subsequent chapter, we pay especially close attention to the contributions of each of the following perspectives to the topic at hand.

Social and Personality English writer and poet John Donne was correct in stating that "no man is an island." The cultural differences that are increasingly apparent as we become a more global world are a testament to how strongly social structures and processes affect the operation of factors from other perspectives. We are a social species, and much of our behavior can be understood in terms of how it maintains our social relatedness with one another. The consequences of failing to maintain connectedness are severe. For example, chronic feelings of social isolation are associated with poor mental and physical health and premature mortality, and longitudinal studies in humans and experimental studies in animals indicate that perceived isolation contributes to these outcomes. In short, feeling left out can be toxic. Behavioral systems are particularly prone to variation, and we illustrate how such variation can be regarded as a source of important data in its own right. In addition to exploring individual differences within the context of personality, we integrate this facet with other perspectives. For example, we discuss how individual differences in responses to stress are best understood by considering epigenetics, learning, and social factors.

Cognitive The human is above all else a thinking organism, and the way that we process information affects our behavior. Whether we are considering the development of behavior, learned behavior, or the aberrations of behavior that accompany psychological disorders, an

understanding of how we think provides considerable insight. For example, we understand that an effective way to improve depressed people's moods is to help them restructure the way that they process information. Instead of students' thinking that flunking an exam means they are not good enough to attend college, we can encourage them to think that although flunking an exam isn't fun, it's not the end of the world either, and they can make some changes that will lead to better performance next time.

Biological and Evolutionary We believe that all introductory psychology students, even those who will never take another psychology course, will gain a better understanding of contemporary psychology in the context of the relationships between biological processes and behavior. For example, when we discuss attraction and close relationships, we mention data showing that viewing a photograph of somebody we love, as opposed to somebody we like, activates the brain's reward circuits and decreases activity in areas associated with social judgment. Not only is love somewhat socially blind, but it really does feel good. Throughout the textbook, we stress the role of evolutionary pressures in shaping both the structures and the functions of the mind. We devote a complete chapter to providing students with a foundation for understanding the interactions between genes and environment, including a basic primer on epigenetics. The importance of gene–environment interactions is woven throughout our discussion of development, but it is also highlighted in other contexts, including discussions of children's responses to being bullied.

Developmental The structures and processes of behavior, as well as behavior itself, change over time. Knowing that most children achieve a theory of mind by the age of 4 years not only is relevant to our understanding of children and their behavior, but also informs discussions of the development of language and social skills and the deficits found in individuals with autism spectrum disorder (ASD). The importance of the developmental perspective does not end in childhood either. January 1, 2011, marked the date at which the oldest of the baby boomers turned 65. From that date, about 10,000 people will turn 65 every day for the next 19 years. As a result of these demographic changes, the percentage of the U.S. population whose social role is retiree is projected to increase dramatically in the coming decades. Understanding developmental changes across the life span is therefore increasingly important.

Clinical We can understand behavior by observing what works, but it is also highly useful to see what happens when things go wrong. Just as the neuroscientist learns about normal brain function by observing changes following the damage caused by a stroke, we can learn much about behavior by observing how it changes because of a psychological disorder. For example, we consider the effects of schizophrenia on classical conditioning in the chapter on learning (Chapter 8).

Delivering Complex Content to Contemporary Learners

We were delighted to see that our first two editions were embraced by faculty working with students representing a wide range of preparation, from community colleges to elite, private universities, as well as by international faculty teaching students with first languages other than English. Our teaching philosophy rejects the common construct of a textbook "level." Instead, we believe that all students can master complex content if it is presented in the right way.

Student-Friendly Writing and Pedagogy

Our goal in writing this textbook is to provide students with the best science possible, which means that we do not avoid complex topics or dumb down the material. To make psychological

science accessible to a wide range of students, we rely on a student-friendly writing style with supportive pedagogy. We break chapters into meaningful chunks, and we use thumbnail images of chapter photos and figures in our summary tables as a mnemonic device that students can use to recall where they read about a topic. Margin definitions and carefully selected key terms help the students focus their learning.

One of our reviewers had this to say about the first chapter of our textbook, which can be one of the most difficult to write: "I am impressed with the History of Psychology chapter in Cacioppo/Freberg. The figures, timeline, interesting AND relevant pictures, and examples throughout the text are fantastic and engaging. It is one of the best history/intro chapters I've read." This reviewer also noticed another one of our goals—to use all photos and figures as teachable moments, not just repetitions of the narrative or pretty placeholders.

Implementation of Guidelines for "Inclusive Psychology"

Today's college and university students represent a wide range of diverse demographic variables, and these variables should be reflected thoughtfully in the textbooks that they read. On behalf of the APA, Trimble, Stevenson, and Worell (2003) provided considerable guidance to textbook authors and publishers regarding opportunities for including diversity content in an introductory psychology textbook. They focus on the following types of diversity: age, culture, race/ethnicity, gender, disability, language, and sexual orientation. Gurung et al. (2016, p. 112), also writing on behalf of the APA, emphasized the need to present culture and diversity as "cross-cutting themes" throughout the introductory psychology course. We have used these papers as a blueprint for incorporating the dimension of diversity in our textbook.

We adamantly concur with Trimble et al. (2003, p. 2) when they state, "Culture, race/ethnicity, gender, disability, sexual orientation, language, and age can be integrated into the main text of every textbook chapter. Highlighting these issues only in special sections or boxes fosters the continued marginalization of members of nondominant groups." We incorporate diversity issues seamlessly throughout the narrative and in illustrations and examples. For example, while we note that Roland Fryer was the youngest African-American professor to obtain tenure at Harvard University, we do so in the context of how his childhood and youth shaped his approaches to educational incentives within a discussion of motivation. Although Trimble et al. (2003) appear to dislike feature boxes, we have found it useful to augment the discussion of culture and gender in the narrative by highlighting special topics in our *Diverse Voices in Psychology* feature. We believe that this combination represents the antithesis of the biggest concern raised by Trimble et al. (2003)—isolated, disconnected discussion of diversity in boxes alone.

Trimble et al. (2003) provide extensive, detailed suggestions for specific content, such as inclusion of stereotype threat and gender and cultural issues in eating disorders, that we have found useful. For interested faculty and students, we have a comprehensive, separate document with chapter and page references indicating how we have implemented these recommendations. Please feel free to email lfreberg@calpoly.edu to obtain a copy.

In addition, great care has been taken to adhere to APA standards on language. The illustrations feature individuals of diverse races, ethnicities, ages, abilities, and gender. When possible, they show people in a positive light (e.g., no sad older adults feeding pigeons) and avoid traditional depictions (e.g., male therapist helping female client). Large numbers of illustrations feature cross-cultural examples. Cross-cultural research is featured whenever possible, such as global studies of subjective well-being.

MindTap

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

For students:

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

In MindTap, instructors can do the following:

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

AP® Features in *Discovering Psychology: The Science of the Mind*

AP® Review Questions in the Text

A set of multiple-choice questions at the end of each chapter, written by Amy Schaffer, Ph.D., Miami Palmetto Senior High School and University of Miami, Miami, Florida.

- These questions, in AP® format, are designed to help students test their understanding of the chapter.

Correlation Guide

A correlation guide provides page references from *Discovering Psychology: The Science of the Mind,* Third Edition, for each of the topics of the AP® Psychology course. With assistance from their teachers, this guide helps students pinpoint what they need to study in the text to be sure they are prepared to take the exam.

AP® Supplements for Students

Fast Track to a 5
Preparing for the AP® Psychology Exam by William James, Milford High School, Highland, Michigan, and Michael McLane, Sterling Heights High School, Sterling Heights, Michigan, includes an introduction to students, a diagnostic test, review sections with questions, and two complete practice tests in AP® format. It can be purchased with the text or separately.

Changes in the Third Edition

Progress in psychological science continues to move forward at a blistering pace, and this third edition has been updated to include many new photos and figures and several hundred new references that reflect the advances in the field since the last edition went to press. As

mentioned previously, we believe that one can't have too much integration of topics, so we added the *Diverse Voices in Psychology* and *Psychology Takes on Real-World Problems* features to give students even more opportunities to form links between psychological topics and between psychology and the real world in which they live.

A sample of the content updates and revisions to each chapter include the following:

Chapter 1 The Science of Mind: The Discipline of Psychology

- Updated information about careers in psychology and related fields
- Made connections between the approach of our textbook and the APA recommendations for the introductory psychology course (Gurung et al., 2016)
- Streamlined discussions of psychology's roots in philosophy and the natural sciences and the early history of psychology
- Introduced the topic of cyberbullying in a new *Psychology Takes on Real-World Problems* feature
- Introduced the importance of considering culture and diversity in our understanding of human behavior in a new *Diverse Voices in Psychology* feature

Chapter 2 The Measure of Mind: Methods of Psychology

- Expanded the discussions of confirmatory bias, the need for concrete variables, and publication bias
- Discussed possible research approaches and ethical concerns involved in learning more about cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Explored the importance of recruiting diverse samples of participants in the *Diverse Voices in Psychology* feature
- Refreshed the *Thinking Scientifically* feature with a discussion of psychology's possible "replication problem"
- Refreshed the *Experiencing Psychology* feature with an exercise using critical thinking steps to evaluate popular press reports.

Chapter 3 The Evolving Mind: Nature and Nurture Intertwined

- Expanded and updated the discussion of sex chromosomes, subfields within genetics that are relevant to psychology, candidate genes for psychological traits and disorders, genomewide association studies, and epigenetics
- Discussed the research ethics associated with genetic research using vulnerable participants in the new *Diverse Voices in Psychology* feature
- Explored gene-environment interactions relevant to peer-to-peer bullying in the new *Psychology Takes on Real-World Problems* feature
- Refreshed the *Connecting to Research* feature with a discussion of possible transgenerational epigenetic change (Dias & Ressler, 2014)
- Refreshed the *Psychology as a Hub Science* feature with an analysis of epigenetic influences of nutrition and psychological disorders
- Refreshed the *Thinking Scientifically* feature with a review of research on the so-called warrior gene and criminal behavior

Chapter 4 The Biological Mind: The Physical Basis of Behavior

- Emphasized the reciprocal relationship of brain and behavior using research on mindset effects on ghrelin levels (Crum, Corbin, Brownell, & Salovey, 2011)
- Updated the discussion of the role of microglia in learning and development and brain connections with the immune system
- Refreshed the *Connecting to Research* feature with a discussion of mirror systems and predicting tennis serves
- Added a review of the field of cultural neuroscience in the *Diverse Voices in Psychology* feature
- Analyzed research on brain networks for empathy in cyberbullies in the *Psychology Takes on Real-World Problems* feature

Chapter 5 The Perceiving Mind: Sensation and Perception

- Added a discussion of "the dress" illusion and why people see it differently
- Revised the discussion of signal detection using radiologist decisions about mammograms to illustrate main concepts
- Expanded the discussion of sensory differences in autism spectrum disorder (ASD)
- Explored differences in vision in young children with ASD in a refreshed *Connecting to Research* feature
- Discussed perceptions of behavior as cyberbullying in the new *Psychology Takes on Real-World Problems* feature
- Added a discussion of how eye movements are shaped by culture in the new *Diverse Voices in Psychology* feature

Chapter 6 The Aware Mind: Elements of Consciousness

- Updated with a discussion of recent work on the dream experience during sleep
- Updated the information on the endogenous cannabinoid anandimide
- Updated the information on the method of action for cocaine, amphetamine, and 3,4-methylenedioxymethamphetamine (MDMA, or Ecstasy)
- Updated the *Psychology as a Hub Science* feature on machine consciousness
- Refreshed the *Thinking Scientifically* feature with an analysis of research on cannabis and psychosis
- Explored legal decisions on free will relevant to suicide resulting from cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Examined the religious use of hallucinogens (entheogens) in the *Diverse Voices in Psychology* feature

Chapter 7 The Feeling Mind: Emotion and Motivation

- Reordered the chapter to discuss emotion before motivation
- Updated the discussion of emotion and the brain
- Added a comparison of suppression and reappraisal strategies of emotion regulation
- Updated the discussion of biological factors and sexual motivation, including the roles of testosterone and oxytocin
- Expanded the discussion of sexual and emotional satisfaction, including research on nonheterosexual relationships
- Updated the discussion on sexual orientation

- Expanded the discussion of Carol Dweck's work on mindset in the context of achievement motivation
- Refreshed the *Experiencing Psychology* feature with an emotional regulation questionnaire (Gross & John, 2003).
- Updated the analysis of lie detection in the *Psychology as a Hub Science* feature
- Reviewed possible motivations for cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Explored emotional expressivity and immigration history in the *Diverse Voices in Psychology* feature

Chapter 8 The Adaptive Mind: Learning

- Updated the discussion of mirror neurons
- Refreshed the *Connecting to Research* feature with an analysis of age effects on responses to consequences
- Discussed the role of observational learning in cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Reviewed research regarding the influence of culture on physical punishment effects in the *Diverse Voices in Psychology* feature

Chapter 9 The Knowing Mind: Memory

- Updated the coverage of highly superior autobiographical memory (HSAM)
- Updated the sections on brain correlates of stages of memory
- Updated the discussion of the biochemistry of memory
- Added a section on exercise effects on memory
- Updated the discussion of memory in posttraumatic stress disorder (PTSD) in the *Thinking Scientifically* feature
- Updated the discussion of eyewitness testimony research in the *Psychology as a Hub Science* feature
- Refreshed the *Connecting to Research* feature with a study on protecting memory retrieval from stress (Smith, Floerke, & Thomas, 2016)
- Evaluated the occurrence of false memories in cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Discussed the own-race bias in memory for faces in the *Diverse Voices in Psychology* feature

Chapter 10 The Thinking Mind: Thinking, Language, and Intelligence

- Expanded the section on decision-making to include systems engineering
- Expanded the discussion of computer models of decision-making
- Updated the discussion of language learning by infants
- Expanded the discussion of culture and emotional intelligence
- Refreshed the *Experiencing Psychology* feature with a decision style instrument
- Explored the language gap resulting from differences in socioeconomic status in the *Diverse Voices in Psychology* feature
- Discussed the categorization of "cyberbully" in the *Psychology Takes on Real-World Problems* feature

Chapter 11 The Developing Mind: Life Span Development

- Updated the discussion of prenatal development, including the effects of the Zika virus
- Expanded the discussion of sex and gender development in newborns, children, and adolescents

- Refreshed the *Experiencing Psychology* feature with a Risk Perception Scale
- Refreshed the *Psychology as a Hub Science* feature with an analysis of the well-being of older adults
- Investigated the influence of age on cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Explored the dilemmas faced in medical gender assignment in the *Diverse Voices in Psychology* feature

Chapter 12 The Individual Mind: Personality and the Self

- Updated and expanded the section on personality–situation interactions
- Updated the discussion on the flexibility of personality in adulthood
- Discussed the relationship between selfies and self-esteem
- Updated and expanded the discussion of brain mechanisms of self-control
- Refreshed the *Connecting to Research* feature with research demonstrating the contagion of temperament traits in children
- Reviewed research on emotional self-regulation and cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Discussed the modification of cultural effects on the self in the *Diverse Voices in Psychology* feature

Chapter 13 The Connected Mind: Social Psychology

- Provided additional clarification about the distinction between the correspondence bias and the fundamental attribution error
- Expanded the discussion of cognitive dissonance and cognitive consistency
- Updated the discussion of Stanley Milgram's obedience studies to include the concept of "engaged followership"
- Discussed the role of bystanders in cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Refreshed the *Experiencing Psychology* feature with the UCLA Loneliness Scale
- Added a discussion of "fake news" to the *Psychology as a Hub Science* feature on social media and persuasion
- Refreshed the *Thinking Scientifically* feature with a discussion of the neuroscience of persuasion
- Reviewed research on the shooter bias in the *Diverse Voices in Psychology* feature

Chapter 14 The Troubled Mind: Psychological Disorders

- Updated the information on the prevalence and possible causes of autism spectrum disorder (ASD)
- Updated the information about the biochemistry of schizophrenia
- Updated the biological correlates of posttraumatic stress disorder (PTSD)
- Added a section on narcissistic personality disorder
- Refreshed the *Experiencing Psychology* feature with scales that assess narcissism
- Discusses the possible psychological disorders that might characterize the cyberbully in the *Psychology Takes on Real-World Problems* feature
- Discussed different prevalence rates of psychological disorders across racial and ethnic groups in the *Diverse Voices in Psychology* feature

Chapter 15 Healing the Troubled Mind: Therapy

- Updated the regulations for hypnotherapy and coaching
- Updated information about antipsychotic medications, lithium, and antidepressants
- Added a section on treating narcissistic personality disorder
- Refreshed the *Interpersonal Relationships* feature with a discussion of the research on relationships by John and Julie Gottman
- Explored culturally competent counseling and psychotherapy in the *Diverse Voices in Psychology* feature
- Discussed possible treatment options for cyberbullies in the *Psychology Takes on Real-World Problems* feature

Chapter 16 The Healthy Mind: Stress and Coping, Health Psychology, and Positive Psychology

- Expanded the discussion of stress and posttraumatic stress disorder (PTSD) among military personnel
- Updated the section on smoking to include e-cigarettes
- Added a section on loneliness and health
- Refreshed the *Experiencing Psychology* feature with a stress mindset instrument
- Discussed building resilience in youth exposed to cyberbullying in the *Psychology Takes on Real-World Problems* feature
- Examined optimism across race and ethnicity in the *Diverse Voices in Psychology* feature

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Preparing for the AP® Psychology Exam

Strategies for the AP® Psychology Exam

An Advanced Placement course is a challenging yet stimulating class. Whether you are taking an AP® course at your school or online, or you are working on the AP® course independently, the stage is set for a rewarding intellectual experience. As the school year progresses and you burrow deeper and deeper into your coursework, you will learn the psychological perspectives, broad concepts, and personalities that have shaped psychology. Fleshing out that knowledge with additional information and examples is thought-provoking and exciting.

But as spring approaches and the College Board exam begins to loom large on the horizon, Advanced Placement can seem downright intimidating, given the enormous scope of information that you need to know in order to score well. If you are intimidated by the College Board exam, you certainly are not alone.

The best way to succeed on an AP® exam is to master it, rather than let it master you. If you manage your time effectively, you will meet one major challenge—learning a considerable amount of material in the time remaining. In addition, if you can think of these tests as a way to show off how well your mind works, you will have an advantage—attitude *does* help.

This book is designed to put you on the fast track to a successful score. Focused review and practice time will help you master the exam so that you can walk in better prepared, more confident, and ready to do well on the test.

Before the Exam

By February, long before the exam, you need to make sure that you are registered to take it. Many schools take care of the paperwork and handle the fees for their AP® students, but check with your teacher or the AP® coordinator at your school to be certain that you are on the list. This is especially important if you have a documented disability and need test accommodations. If you are studying AP® Psychology independently, call AP® Services at the College Board for the name of an AP® coordinator at a local school who will help you through the registration process.

The evening before the exam is not a great time for partying—nor is it a great time for cramming. If you like, look over class notes or skim through your textbook, concentrating on the broad outlines, rather than the small details, of the course. You might also want to skim through this book and read the AP® Tips. This is also a great time to get your things together for the next day. Sharpen a fistful of number 2 pencils with good erasers for the multiple-choice section; collect several black or dark-blue ballpoint pens for the free-response questions; make sure you have a watch and turn off the alarm if it has one; get a piece of fruit or a granola bar and a bottle of water for the break; make sure you have your Social Security number and whatever photo identification and admission ticket are required. Then relax, and get a good night's sleep.

On the day of the exam, it is wise to eat breakfast—studies show that students who eat a healthy breakfast before testing earn higher grades. Be careful not to drink a lot of liquids, thereby necessitating a trip to the bathroom during the test. Breakfast will give you the energy you need to power you through the test—and more. Remember, cell phones are not allowed in the testing room. You will spend some time waiting while everyone is seated in the right room for the right test. That's before the test has even begun. With a short break between Section I and Section II, the AP® Psychology exam lasts for over two and a half hours. Be prepared for a long test time. You don't want to be distracted by a growling stomach or hunger pangs.

Be sure to wear comfortable clothes; take along a sweater in case the heating or air-conditioning is erratic.

You have been on the fast track. Now go get a 5!

Taking the AP® Psychology Exam

The AP® Psychology exam consists of two sections: Section I is made up of 100 multiple-choice questions; Section II contains 2 free-response questions. You will have 70 minutes to complete the multiple-choice portion. The questions are then collected, and you will be given a short break. Be sure to refrain from discussing the exam with classmates during the break. You then have 50 minutes for the free-response questions. You must answer both questions. Some AP® exams allow you to choose among the free-response questions, but psychology is *not* one of them. Keep an eye on your watch and devote 25 minutes to each free-response question. Please note that watch alarms are *not* allowed.

Below is a chart to help you visualize the breakdown of the exam:

Section	Multiple-Choice Questions	Two Free-Response Questions (Essay)
Weight	66 ⅔% of the exam	33 ⅓% of the exam
Number of Questions	100	2
Time Allowed	70 minutes	50 minutes
Suggested Pace	40–45 seconds per question	25 minutes per question

Strategies for the Multiple-Choice Section

Here are some guidelines to help you work your way through the multiple-choice questions:

- **Multiple-choice scoring** Each correct answer is worth 1 point. There are five possible answers for each question. If you cannot narrow down the choices at all, you have a 20% chance of guessing correctly. If you can eliminate even one response, it will improve your chances of guessing correctly. Your best strategy is to go through the entire multiple-choice section, answering all questions to which you know the answers. If you skip a question, be careful to skip that line on the answer sheet as well. Then go back and work on the questions you skipped. Leave yourself enough time to fill in answers—even if they are guesses—on all unanswered items before the time expires.
- **Read each question carefully** Pressed for time, many students make the mistake of reading the questions too quickly or merely skimming them. By reading each question carefully, you may already have some idea about the correct answer. You can then look for that answer in the responses. Careful reading is especially important in EXCEPT questions (see the next section which describes the types of multiple-choice questions).
- **Eliminate any answer you know is wrong** You can write on the multiple-choice questions in the test book. As you read through the responses, draw a line through every answer you know is wrong.
- **Read all of the possible answers, then choose the most accurate response** AP® exams are written to test your precise knowledge of a subject. Sometimes there are a few possible answers but one of them is more specific and therefore the correct response.
- **Avoid absolute responses** These answers often include the words "always" or "never." For example, the statement "The occipital lobe always processes light" is incorrect because in cases of traumatic brain injury in young children the brain can and often does adapt to compensate.

- **Mark and skip tough questions** If you are hung up on a question, mark it in the margin of the question book. You can come back to it later. Make sure you skip that question on your answer sheet as well.

Types of Multiple-Choice Questions

There are various kinds of multiple-choice questions. Here are some suggestions for how to approach each one.

Classic/Best-Answer Questions

This is the most common type of multiple-choice question. It simply requires you to read the question and select the correct answer. For example:

1. Which psychologist is considered the founder of American behaviorism?
   (A) Sigmund Freud
   (B) Harry S. Sullivan
   (C) William James
   (D) Wilhelm Wundt
   (E) John B. Watson

Answer: E. This question has only one correct answer. John B. Watson is considered the father of American behaviorism.

Except Questions

In EXCEPT questions, all of the answers but one are correct. The best way to approach these questions is to treat them as true/false questions. Mark a T or an F in the margin next to each possible answer. There should be only one false answer, and that is the answer you should select. For example:

1. All of the following are considered symptoms of major depressive disorder EXCEPT
   (A) lack of energy
   (B) loss of appetite
   (C) continued interest in activities
   (D) prolonged feelings of despair
   (E) suicidal thoughts

Answer: C. A person with major depressive disorder does not have a continued interest in daily activities.

Analysis/Application Questions

1. Jim is having a difficult time forming and maintaining commitments in relationships. His last relationship ended because Jim did not seem to know what he wanted in his life, which affects what he wants from other people. According to Erik Erikson, which psychosocial conflict is Jim presently experiencing?
   (A) Trust versus mistrust
   (B) Initiative versus guilt
   (C) Generativity versus stagnation
   (D) Identity versus role confusion
   (E) Autonomy versus doubt/shame

Answer: D. According to Erikson, a person tries to find his or her place in life during adolescence, to figure out exactly who he or she is. This explains why adolescents may switch peer groups, trying to find where and with whom they fit in. When adolescents are unable to find their sense of self-identity, role confusion occurs.

Free-Response Questions

There are two mandatory free-response questions on the AP® Psychology exam, and you will have 50 minutes to answer both of them. The questions can cover multiple content areas and typically involve multiple chapters. Be prepared to combine several topics and psychological perspectives within your answers and apply this knowledge to a situation.

Some free-response questions may ask you not only to define but also to apply the topics presented within the question. Some questions may ask that you *only* apply your knowledge of the identified terms, concepts, or theories. Be sure to read both questions and identify what they are asking. Even if you are not asked for a definition, it is helpful to include one in case your application is not a strong response; readers can read your definition and if you make it clear that you know the term it can help to clarify the application point.

Typically one of the questions will be primarily devoted to a particular chapter (i.e., psychological disorders, learning, human development) and the other will ask you to synthesize multiple chapters or concepts into one answer. In other words, one question will be more specific, whereas the other question will be much broader in nature.

Essays for free-response questions can be written in any order. Whether you write the essays in or out of order, make sure you put the number of the question in the upper corner of each page of your essay booklet. In addition, questions are sometimes broken into parts, such as (a) and (b). When this is the case, label each part of your response.

These are not traditional essay questions. Free-response questions in AP® Psychology do not require either an introduction or conclusion or a thesis; these elements are not counted and waste valuable time for you and the reader who is grading your free-response question. Many of these questions may be written in a short-answer format. Bulleted responses are accepted if they are complete sentences.

Although this may sound easier than writing a traditional essay, it is important that you know the material well because these are targeted questions. Even if you do not feel you know what the question is asking, try to answer it as best you can; each individual part of a question is scored separately.

Exam readers want specifics, so don't use words such as "things" or "stuff," or general "pop" psychology terms that you have heard on television. Readers are looking for accurate information presented in clear, concise prose. You can't mask inadequate information, even with elegant prose. Demonstrate to the reader that you know the vocabulary of the field.

You will have a 50-minute block for this section, so watch your time. In most cases, you should allow 25 minutes for each question. Spend 5 minutes reading the question and jotting down a few words on each point you want to cover in your answer. Then spend 15 minutes writing your response. Save the last 5 minutes to read over your response to make sure you have covered each point in enough detail. If 25 minutes have passed and you aren't finished with a question, leave some space, and start a new question on the next page. You can come back later if you have time.

Vocabulary for Free-Response Questions

In answering the free-response questions, carefully read each question and do exactly what it asks. It is important to note the word choices used in the questions.

- **Define** means to state the meaning of a word or phrase or to give a specific example. For instance, if a question asks you to define "heuristics," the response should be along the lines of "A heuristic is a general rule used to help reach a decision." Definitions are usually just one sentence.
- **Identify** means to select a factor, person, or idea and give it a name. For instance, if a question asks you to identify one advantage of a case study, a possible response is "One advantage of a case study is that it allows the researcher to gain an in-depth view into a rare condition or disorder."
- **Explain why/explain how** means to give a cause or reason. Explanations usually include the word *because*. For instance, if a question asks you what are some

disadvantages of using a case study, one possible response is "One disadvantage in using a case study is that the researcher cannot generalize to the wider, more general population because the event or disorder being studied does not occur often enough or is rare."

Scoring Free-Response Questions

These questions are scored using a rubric that assigns points for each part of the answer. For example, if Part (a) requires you to identify and explain two factors, that part of the response will be worth 4 points (1 point for each identification and 1 point for each explanation). If Part (b) requires you to identify and explain one factor, that part of the response will be worth 2 points (1 point for the identification and 1 point for the explanation), for a total of 6 possible points on the question.

Example Free-Response Question

1. After the first psychology test, Dr. Border is interested in knowing whether lectures improve students academic performance on the second test. Design a study that would provide Dr. Border with adequate data to address his question. Be sure to address each of the following in your answer:
   - Independent variable (IV)
   - Dependent variable (DV)
   - Sampling of participants
   - Assignment of participants
   - Possible outcome of experiment
   - Potential confounding variables

Scoring (6 Points Possible)

- Independent variable (IV) (point 1)
  - The independent variable (IV) in this experiment is the lecture.
- Dependent variable (DV) (point 2)
  - The dependent variable (DV) in this experiment is the performance on the test.
- Sampling of participants (point 3)
  - The sampling of participants refers to which group of people are selected from the potential population for the experiment. For example, if the experiment pertains to women between the ages of 18 and 25, then only women within this parameter will be selected. This allows the researcher the opportunity to study a selected group from Dr. Border's classes.
- Assignment of participants (point 4)
  - How participants are assigned to either the experimental or the control group.
  - Randomly selecting participants allows all participants the same chance of being assigned to a particular group.
- Possible outcome of experiment (point 5)
  - The possible resulting effects of the experiment must be mentioned (either the scores improved or they did not improve after the lectures).
  - As long as the result is supported, it doesn't matter what outcome or result is mentioned.
- Potential confounding variables (point 6)
  - Variables that may influence the experiment and cannot be accounted for or controlled.
  - Some possible confounding variables are the level of participants' education, different student cognitive skills, individual motivation, and Dr. Border's lecturing abilities; no mention of a double-blind study.

Sample Free-Response Answer #1

The independent variable (IV) would be the lectures. The dependent variable (DV) would be how much the subjects' academic performance improved, if at all. Researchers would randomly assign participants to either the lecture group (the experimental group) or the non-lecture group (the control group) by assigning each subject a number and then randomly selecting numbers out of a hat. Participants should be selected from one psychology class, with equal numbers of males and females, to obtain a solid sample size. A possible outcome of the experiment would be that those who listened to lectures would receive higher scores on the second psychology test. One possible confounding variable would be each student's prior knowledge and exposure to psychology because this may artificially inflate their scores on the exam.

All points were scored in this sample response.

Score: 6/6

Sample Free-Response Answer #2

Independent variable (IV) is how much the subjects' academic performances increased. Dependent variable (DV) is which group participants were assigned to (lecture or non-lecture).

Assignment of participants must be done in a random manner to control for potential experimenter bias. The sample size must be adequate enough to represent the population the researcher is studying, and therefore must include both males and females. A confounding variable is any variable that cannot be controlled for. In this experiment the amount of prior knowledge cannot be controlled for and thus could influence the results.

Points 1 and 2 were not scored because they were incorrectly identified. The remaining points all scored.

Score: 4/6

Sample Free-Response Answer #3

Independent variable (IV) is the variable that is manipulated.

Dependent variable (DV) is the measurement or outcome of the independent variable.

Sampling of participants, random sampling, would enable all participants an equal chance of being selected for the experiment.

Assignment of participants, random assignment of individuals, for each group gives each participant an equal chance of being assigned to a particular group.

Possible outcome of the experiment would be the findings of the research.

Confounding variables are variables that are uncontrollable and may affect the outcome of the experiment.

No points were scored because the individual simply defined each term and did not apply the terms, as requested.

Score: 0/6

Correlation of Topics for the AP® Psychology Course to *Discovering Psychology: The Science of the Mind*, 3e

I. HISTORY AND APPROACHES (2–4%)	
A. History of Psychology	pages 3–20
B. Approaches	pages 4, 21–27, 29, 31
1. Biological	pages 18–22, 31
2. Behavioral	pages 14–20, 25, 31
3. Cognitive	pages 14, 17, 19–20, 22, 31
4. Humanistic	pages 14–15, 20
5. Psychodynamic	pages 12–14, 20
6. Sociocultural	pages 22–25, 30
7. Evolutionary	pages 21–22, 31
C. Subfields in Psychology	pages 21–23, 27–28, 31
II. RESEARCH METHODS (8–10%)	
A. Experimental, Correlational, and Clinical Research	Pages 32–66
B. Statistics	
1. Descriptive	pages 45–47, 50, 54–60
2. Inferential	pages 50, 54, 60–61
C. Ethics in Research	pages 44, 62–66, 78, 84, 120, 123, 144
III. BIOLOGICAL BASES OF BEHAVIOR (8–10%)	
A. Physiological Techniques (e.g., imaging, surgical)	pages 4, 7–9, 106–107, 109, 120, 123
B. Neuroanatomy	pages 89–91, 104–105, 111–127, 133–146, 645–646
C. Functional Organization of Nervous System	pages 89, 109–111, 127–130, 132, 146
D. Neuroplasticity	pages 80–84
E. Endocrine System	pages 128, 131–132, 146, 638
F. Genetics	pages 69–89, 91, 98–100
G. Evolutionary Psychology	pages 21–22, 31, 86–100, 103–104
IV. SENSATION AND PERCEPTION (6–8%)	
A. Thresholds and Signal Detection Theory	pages 151–156, 190
B. Sensory Mechanisms	pages 149–151, 156–161, 166–168, 171–186, 190–191
C. Attention	pages 152–153, 163, 168
D. Perceptual Processes	pages 149–150, 161–166, 168–170, 175–178, 182–183, 186–191
V. STATES OF CONSCIOUSNESS (2–4%)	
A. Sleep and Dreaming	pages 199, 203–209, 212, 209–211, 229, 652–653
B. Hypnosis	pages 224–225, 229
C. Psychoactive Drug Effects	pages 215–224, 229, 662–668, 673

VI. LEARNING (7–9%)	
A. Classical Conditioning	pages 278–294, 317
B. Operant Conditioning	pages 276–282, 295–311, 317
C. Cognitive Processes	pages 292, 306–307, 317
D. Biological Factors	pages 307–308, 317
E. Social Learning	pages 281–282, 308, 311–317
VII. COGNITION (8–10%)	
A. Memory	pages 318–360
B. Language	pages 382–391, 405
C. Thinking	pages 336–337, 362–382, 405
D. Problem Solving and Creativity	pages 370–382, 405
VIII. MOTIVATION AND EMOTION (6–8%)	
A. Biological Bases	pages 231–233, 273–274
B. Theories of Motivation	pages 252–253, 270–274
C. Hunger, Thirst, Sex, and Pain	pages 253–267, 273–274
D. Social Motives	pages 267–269, 274
E. Theories of Emotion	pages 232–252, 274
F. Stress	pages 638–673, 684
IX. DEVELOPMENTAL PSYCHOLOGY (7–9%)	
A. Life-Span Approach	pages 406–410
B. Research Methods (e.g., longitudinal, cross-sectional)	pages 52–53, 66
C. Heredity—Environment Issues	pages 33–34, 408–411, 413–416, 422, 431–438, 444
D. Developmental Theories	pages 409–410
E. Dimensions of Development	
1. Physical	pages 411–422, 438–441, 445, 448–450, 454–455
2. Cognitive	pages 425–431, 442–443, 445–446, 448, 450–451, 454–455
3. Social	pages 431–437, 443–449, 451–455
4. Moral	pages 442–443, 455
F. Sex Roles and Gender Development	pages 417, 423–424, 439, 455
X. PERSONALITY (5–7%)	
A. Personality Theories and Approaches	pages 456–476, 481–484, 490–497
B. Assessment Techniques	pages 476–481, 497
C. Growth and Adjustment	pages 484–490, 497
XI. TESTING AND INDIVIDUAL DIFFERENCES (5–7%)	
A. Standardization and Norms	pages 57–58
B. Reliability and Validity	page 54
C. Types of Tests	pages 476–480
D. Ethics and Standards in Testing	page 481
E. Intelligence	pages 392–402, 404–405

XII. ABNORMAL BEHAVIOR (7–9%)

A. Definitions of Abnormality	pages 548–551, 593
B. Theories of Psychopathology	pages 547–548, 552–553
C. Diagnosis of Psychopathology	pages 122, 551–552, 593, 600
D. Types of Disorders	
1. Anxiety	pages 572–577, 592–593
2. Bipolar and Related	pages 563–564, 572, 593
3. Depressive	pages 565–572, 593, 642–643, 645
4. Dissociative	pages 581–582, 593
5. Feeding and Eating	pages 260–262, 652–653, 665–666, 673
6. Neurodevelopmental	pages 547–548, 553–559, 593, 618–621
7. Neurocognitive	pages 450–451
8. Obsessive-Compulsive and Related	pages 577–579, 593
9. Personality	pages 583–589, 593
10. Schizophrenia Spectrum and Other Psychotic	pages 559–563, 572, 593
11. Somatic Symptom and Related	pages 582–583, 593
12. Trauma and Stressor-Related	pages 580–581, 590, 593, 643–655

XIII. TREATMENT OF ABNORMAL BEHAVIOR (5–7%)

A. Treatment Approaches	
1. Psychodynamic	pages 598, 607–608, 611, 617, 637
2. Humanistic	pages 599, 609–610, 617, 637
3. Behavioral	pages 290–291, 598, 610–612, 617–620, 628–630, 636–637
4. Cognitive	pages 595–596, 598, 612, 617, 626–628, 630–633, 636–637
5. Biological	pages 594–598, 613–617, 618–619, 621–626, 628–633, 636–637
B. Modes of Therapy (i.e., individual, group)	pages 596–597, 600–607, 637
C. Community and Preventive Approaches	pages 622–623

XIV. SOCIAL PSYCHOLOGY (8–10%)

A. Group Dynamics	pages 527–530, 535–539, 545
B. Attribution Processes	pages 505–509, 516, 545
C. Interpersonal Perception	pages 498–504, 531–534, 543, 545
D. Conformity, Compliance, Obedience	pages 522–527, 545
E. Attitudes and Attitude Change	pages 510–522, 545
F. Organizational Behavior	This objective is not addressed in this textbook.
G. Aggression/Antisocial Behavior	pages 539–542, 545
H. Cultural Influences	pages 504, 507–508, 517–522, 536, 541–542

Taste buds contained in the papillae of the tongue are far more responsive to bitter tastes than to sweet tastes.

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1

The Science of Mind

THE DISCIPLINE OF PSYCHOLOGY

LEARNING OBJECTIVES

1. Identify the five in-depth perspectives of psychology and explain how integrating these perspectives leads to a more comprehensive and accurate view of behavior and mental processes.
2. Explain why issues of diversity and ethics are important to explore across all topics in psychology.
3. Analyze the contributions of philosophy and the natural sciences to modern psychology.
4. Describe how early movements in psychology are significant for modern psychology.
5. Discuss the importance of the scientific method as a foundation for psychology.
6. Explain why psychology's role as a hub science supports applications in many academic fields, contributes to the solutions of critical contemporary problems, and informs the development of public policies.

STUDYING THE SCIENCE OF PSYCHOLOGY CAN lead you to see yourself and other people in completely new ways. Hundreds of years ago, people believed that the world was flat and the Sun and stars circled the Earth. Careful scientific research slowly dispelled these inaccurate notions. Nonetheless, we hold tightly to many equally false commonsense beliefs about the human mind and behavior. We all "know" that opposites attract, but we also "know" that birds of a feather flock together—so why do we need psychology to tell us what we already "know"? The problem is that both statements cannot be true at the same time, so the real state of affairs is neither obvious nor simple. Just as careful science was required to understand our planet's place in the universe, the same scientific techniques are providing us with a more accurate, complete view of the human mind.

Let's begin with a seemingly simple and familiar example: our ability to taste. We know a lot about taste—what we like or dislike, the different qualities of taste, and so on. Most of us can taste sweetness in a solution made of 1 part sugar and 200 parts water. As remarkable as this sensitivity appears to be, however, people can detect 1 part bitter substance (like quinine or the chemicals in broccoli) in 2 million parts water. This contrast in taste sensitivity between sweet and bitter does not reflect the actual difference between sweet and bitter substances—that is, bitter tastes are not 10,000 times stronger than sweet tastes—but rather how we experience them. Why would we have such a vast difference in sensitivity between these types of tastes?

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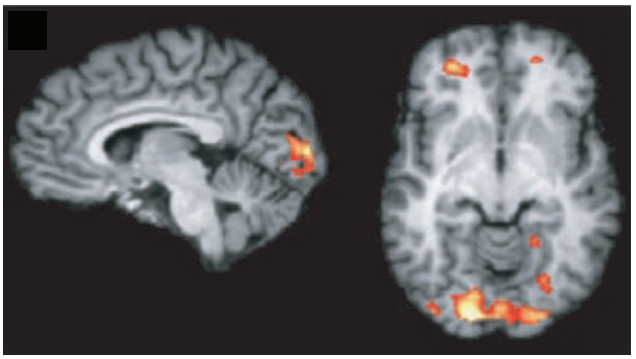
Our personal experience of taste does not help us much in answering this question, but psychological science can. As it turns out, our greater sensitivity to bitter tastes is highly adaptive: Most poisons or toxins taste bitter, and if you want to stay alive, it is more important to avoid swallowing poison than to

Introspection is the personal observation of our own thoughts, feelings, and behaviors. Because we are not perfect observers of the operations of our own minds, psychologists developed other methods that provide scientific insight into the mind. In this functional magnetic resonance imaging (fMRI) scan, areas of the brain that were more active when participants were hungry than when they were full are highlighted. Through technology, researchers can better understand how the brain regulates hunger.

From D. Fuhrer, S. Zysset, & M. Stumvoll, Brain Activity in Hunger and Satiety: An Exploratory Visually Stimulated fMRI Study, *Obesity* (2008) 16: 945–950. Nature Publishing Group.



enjoy something sweet. Being far more sensitive to tastes that are bitter is a trait that has served our species well because it helps us avoid eating things that could kill us. Psychology helps us understand why we do the things we do by providing a context for understanding the mind and behavior.

To gain that understanding, psychology addresses questions from multiple scientific perspectives. One can think of this like the zoom feature in Google Earth. In some parts of this textbook, we will zoom in on human behaviors, like looking at the highly magnified image of the papillae on the tongue (pictured on page 2), which allow us to taste, and trace the messages about taste sent from the tongue to the brain. At other times, we'll zoom out, to take in the larger picture and better understand why the boy on the previous page is giving his bitter-tasting broccoli a skeptical look.

Psychologists approach the study of mind using various in-depth perspectives, which will be described in this chapter. For example, we can look at the little boy's reaction to his broccoli from a developmental perspective, which tells us that taste sensitivity decreases over the life span. Using a biological perspective, we can determine the neural mechanisms responsible for the difference in taste sensitivity. Or, using the social perspective, we can think about social influences like culture on food preferences. Cottage cheese, enjoyed by many Americans, is viewed with disgust in some other parts of the world. Meanwhile, fruit bat pie, a delicacy in Palau, might not be a popular item in the United States.

Although single perspectives can tell us a lot about a phenomenon like our sensitivity to bitter tastes, no one perspective can give us a complete answer. The best view comes from putting multiple perspectives together. You can learn a lot about your house by zooming in on it in Google Earth, but when you see how your home fits into the larger context of city, state, country, and planet, that viewpoint adds something special to your understanding.

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We'll start by learning more about psychology's main perspectives, along with a little background about their origins. Our approach to these perspectives is consistent with recent recommendations for teaching introductory psychology made by the American Psychological Association's Board of Educational Affairs (Gurung et al., 2014). Once we understand these perspectives, we'll be in a better position to understand how they come together to give us the big picture.

What Is Psychology?

The study of the **mind** is as fascinating as it is complex. Psychological scientists view the mind as a way of talking about the activities of the brain, including thought, emotion, and behavior. A quick look at this textbook's table of contents will show you the variety of approaches to *mind* that you will encounter, such as the thinking mind (cognitive psychology) and the troubled mind (abnormal psychology).

The word *psychology* is a combination of two Greek words: *psyche* (or *psuche*), or "soul," and *logos*, meaning "the objective study of." For the ancient Greeks, a soul was close to our modern view of a spirit or mind. *Logos* is the source of all our "ologies," such as biology and anthropology. Literally translated, therefore, **psychology** means "the objective study of the mind." Contemporary definitions of psychology refine and update this basic meaning. Today's psychologists define their field as the scientific study of behavior, mental processes, and brain functions—that is, the scientific study of the mind. Increased recognition that the brain is the organ of the mind has led many psychology departments to expand their names to the Department of Psychological and Brain Sciences (or the equivalent).

The phrase "behavior, mental processes, and brain functions" has undergone several changes over the history of psychology. *Behavior* refers to any action that we can observe. As we will see in Chapter 2, observation has been an important tool for psychologists from the early days of the discipline. Our definition does not specify whose behavior is to be examined. Although the bulk of psychology focuses on human behavior, animal behavior has been an essential part of the discipline, both for understanding animals better and for comparing and contrasting animal and human behavior.

The study of both *mental processes* and *brain functions* has been highly dependent on the methods available to psychologists. Early efforts to study mental processes were generally

mind The brain and its activities, including thought, emotion, and behavior.

psychology The scientific study of behavior, mental processes, and brain functions.

PSYCHOLOGY AS A HUB SCIENCE

Why Is Psychology a Hub Science?

MOST READERS OF THIS BOOK are not pursuing careers in psychology, so how will this material help you in your chosen career? Psychology is all about people, and nearly all occupations require an understanding of people and their behavior. An architect cannot design a functional space without considering how people respond to being crowded. An attorney cannot cross-examine a witness without an understanding of memory, motivation, emotion, and stress. A teacher cannot encourage students to reach their potential without an understanding of child development and learning. Business leaders and economists cannot predict the movements of markets without understanding the minds making the relevant decisions. The study of psychology, then, provides you with better insight into and understanding of many occupations and fields of study.

You probably have seen applications that allow you to map your friendship networks on social media, with shorter links indicating greater connectivity and larger bubbles indicating more overlapping friendships with another person. Kevin Boyack and his colleagues generated a similar map of the sciences (see ● Figure 1.1) but used reference lists in journal articles instead of friendship networks (Boyack, Klavans, & Börner, 2005). The resulting map shows the extent to which each of the sciences are influential and what other sciences they most influence. Boyack and colleagues referred to the most influential sciences as hub sciences. Their analysis shows that psychology is one of the seven major hub sciences, with strong connections to the medical sciences, the social sciences, and education. In the upcoming chapters of this book, we will highlight these connections with examples that are relevant to each particular chapter. ■

FIGURE 1.1

Psychology as a Hub Science. This map of science was generated by comparing citations from more than 1 million papers published in more than 7,000 journals since 2000. Psychology appears among the seven major areas of science, indicated in the map by a different font. The other six major areas are social sciences, mathematics, physics, chemistry, earth sciences, and medicine.

Source: Adapted from "Mapping the Backbone of Science," by K. W. Boyack et al., 2005, *Scientometrics, 64*(3), 351–374. With kind permission from Springer Science+Business Media.

unsatisfactory because they relied on the use of **introspection**, or the personal observation of your own thoughts, feelings, and behaviors. Because it is difficult for others to confirm your introspections, this subjective approach does not lend itself well to the scientific method. If you say that you are feeling hungry, how can anyone else know whether your observation is accurate? In addition, your mind and behavior are governed by a host of structures, factors and processes, most of which are not available through introspection. Innovations in the methods and mathematics used to investigate brain activity and behavior have allowed psychologists to revisit the question of mental processes and brain functions with greater objectivity and success.

What Are Psychology's Roots?

The empiricist philosophers had a profound influence on the foundations of American political thought—that all of us are created equal. For generations, Europe had been ruled by people who were born into positions of power instead of earning the privilege of leading through hard work and education. If knowledge is not innate or inborn, any of us can learn enough to grow up to be president.

Psychology is a relatively young discipline, dating back only to the 1870s. However, topics that interest modern psychologists go back farther in the history of human thought. People living as long ago as 6000 to 5000 BCE in Assyria described their dreams (Restak, 1988). Among these accounts are descriptions of being chased, which are still among the most common dreams that people experience (Nielsen et al., 2003). See ● Figure 1.2 for common dream themes.

The psychology family tree includes two major roots: **philosophy** and the **natural sciences**. Psychologists answer questions traditionally posed by philosophers by borrowing the methods of the natural sciences. We examine scientific methods in detail in Chapter 2.

introspection A personal observation of your own thoughts, feelings, and behavior.

philosophy The discipline that systematically examines basic concepts, including the source of knowledge.

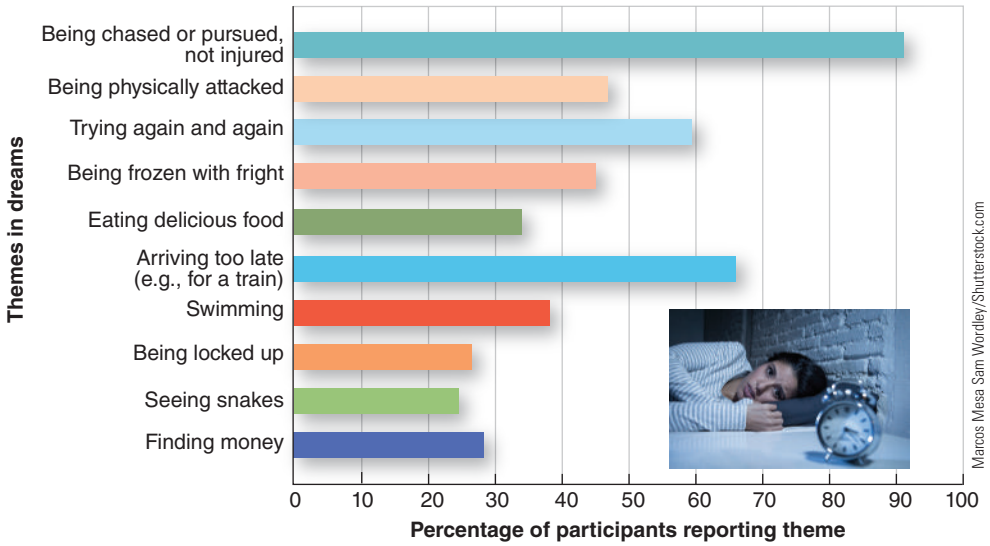
natural sciences Sciences that study the physical and biological events that occur in nature.

Psychology's Philosophical Roots

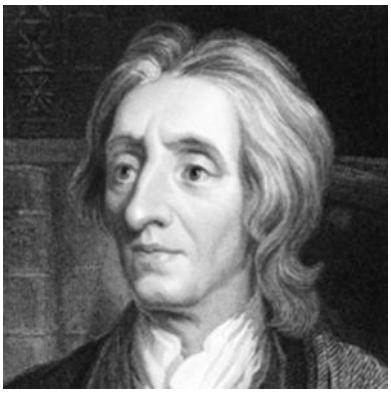
Philosophers and psychologists share an interest in questions regarding the nature of the self, the effects of early experience, the existence of free will, and the origin of knowledge. Both disciplines consider the relative balance of biological factors (nature) and environmental factors (nurture) in the resulting human behavior. Both attempt to determine the relationships between self-interest and community welfare, between body and mind, and between humans and other species with which we share the planet. Although we typically consider questions of the unconscious mind and abnormal behavior to be the realm of the

FIGURE 1.2

Many People Report Dreams with the Same Themes. Although we don't understand why we dream about certain things, many people report similar themes in their dreams.
Source: Adapted from "Typical Dreams of Canadian University Students," by T. A. Nielsen et al., 2003, *Dreaming, 13*, 211–235.



(a) www.BibleLandPictures.com/Alamy Stock Photo



(b) Georgios Kollidas/Shutterstock.com

(c) Cynthia Johnson/Getty Images

One of the most significant questions shared by philosophy and psychology asks whether the mind is inborn or is formed through experience. (a) Philosophers beginning with Aristotle (384–322 BCE) believed that all knowledge is gained through sensory experience. (b) Beginning in the 17th century, this idea flourished in the British philosophical school of *empiricism*. Empiricists, like John Locke, viewed the mind as a "blank slate" at birth, which then was filled with ideas gained by observing the world. (c) Contemporary psychologists believe that experience interacts with inborn characteristics to shape the mind. Intelligence, for example, is influenced by both genetics and experience. During the 1970s, Romanian orphans adopted at young ages recovered from the effects of their seriously deprived social circumstances, but those who endured years of deprivation had more severe cognitive deficits (Ames, 1997).

psychologist, philosophers investigated these issues thousands of years before the first psychologist was born.

Psychology's Natural Sciences Roots

Running along a parallel track to the early philosophers, ancient physicians were laying the foundation of our biological knowledge of the brain and nervous system, discussed in greater detail in Chapter 4. During this pursuit, physicians helped develop the scientific methods that would become central to contemporary psychology and previewed the application of the knowledge that they gained to the improvement of individual well-being.

Until fairly recently, the whole of medicine remained a primitive business. Beginning in the 17th and 18th centuries, scientists armed with new technologies, including the light microscope (see ● Figure 1.3), began to make a series of important discoveries about the human body and mind. For example, they demonstrated that a single sensory nerve carried one type of information instead of multiple types. You might have already duplicated this research yourself while rubbing your sleepy eyes—you see a flash of light. The nerves serving the retina of the eye do not know how to process information about touch or pressure. When stimulated, they are capable of only one type of message—light. Hermann von Helmholtz (1821–1894) asked his participants to push a button when they felt a touch. When a thigh was touched, participants reacted faster than when a toe was touched. Because the toe is farther from the brain than the thigh, signals from the toe required more time to reach the brain. These types of discoveries about the physical aspects of mind convinced scientists that the mind was not supernatural and could be studied scientifically.

Philosophers began to incorporate physiological and psychological concepts into their work, and natural scientists began to explore the questions asked by philosophers. The gradual merger of these approaches resulted in a series of experiments that looked increasingly like contemporary psychology. Scientists began to ask questions about the relationships between physical stimulation and its resulting sensations. For example, Gustav Fechner (1801–1889) was able to

Ancient people might have attempted to cure headaches, seizures, or psychological disorders by drilling holes in the skull. Bone growth around the hole indicates that some patients survived the procedure.

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