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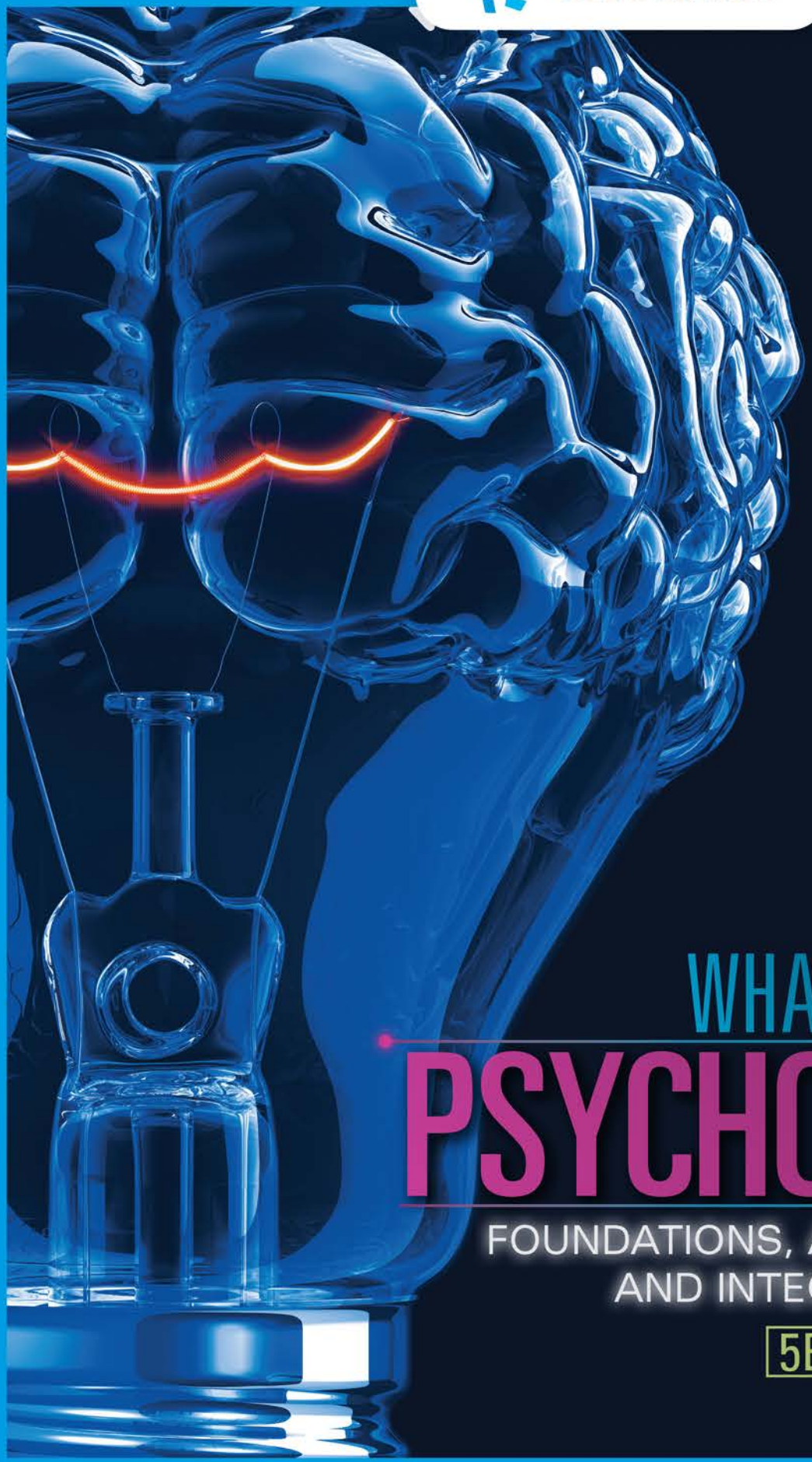

ELLEN PASTORINO
SUSANN DOYLE-PORTILLO

WHAT IS PSYCHOLOGY?

FOUNDATIONS, APPLICATIONS, AND INTEGRATION

5E

FIFTH EDITION

What Is Psychology?

Foundations, Applications & Integration

Ellen Pastorino | Valencia College

Susann Doyle-Portillo | University of North Georgia

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***What Is Psychology? Foundations, Applications, and Integration,* Fifth Edition**
Ellen Pastorino and Susann Doyle-Portillo

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For Luca James
Dream big, be bold, and know that you are loved –
deeply and always.

—Nona

For my husband, Eulalio Ortiz Portillo. Eres mi mundo
y mi vida.

—Susann Doyle-Portillo

About the Authors

Ellen E. Pastorino (Ph.D., Florida State University, 1990) is a developmental psychologist who established her teaching career at Gainesville State College in Georgia. As a tenured professor, she created and developed the college's Teaching and Learning Center, working with faculty to promote student learning. For the past 22 years, she has been teaching at Valencia College in Orlando, Florida. Here, too, she has worked with faculty in designing learning-centered classroom practices. Ellen has won numerous teaching awards, including the University of Georgia Board of Regents Distinguished Professor, the NISOD Excellence in Teaching Award, and Valencia's Teaching and Learning Excellence Award. Ellen has published articles in the *Journal of Adolescent Research* and *Adolescence* and has participated in many regional and national teaching conferences. However, her main passion has always been to get students excited about the field of psychology. Ellen is a member of the Association for Psychological Science (APS) and she served for 10 years as the Discipline Coordinator of Psychological Sciences at Valencia's Osceola campus. She has authored test banks, instructor manuals, and student study guides. While working as a consultant for IBM Corporation, she developed numerous educational materials for teachers and students. Her current interests include reaching underprepared students and educating psychology undergraduate majors about potential job and career prospects. Ellen strives to balance her professional responsibilities with her love of physical fitness and family life.

Susann M. Doyle-Portillo (Ph.D. in Social Cognition, University of Oklahoma, 1994) is Department Head and Professor of Psychological Science at the University of North Georgia where she has taught for the past 26 years. She holds bachelor's degrees in engineering and psychology, and is a member of several professional organizations, including the *Association for Psychological Science (APS)* and the *Society for Personality and Social Psychology (SPSP).* She has published articles in journals such as *Social Cognition, Contemporary Social Psychology,* the *American Journal of Health Education,* and *Personality & Individual Differences*, but the main focus of her career is teaching. During her career, Susann has twice been listed in Who's Who Among America's Teachers. In addition to her teaching and research activities, she has mentored many undergraduate researchers and authored several test banks, instructor manuals, and student study guides.

Brief Contents

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Together, we have nearly 60 years of experience teaching Introductory Psychology. We have each spent the bulk of our careers teaching multiple sections of Introductory Psychology each semester—it is our bread and butter, so to speak. So, it's a good thing that Introductory Psychology is also our favorite course. Contrary to what many may think of professors teaching the same course over and over, it never grows old for us. Teaching Introductory Psychology allows us to touch on many different aspects of our fascinating field and to work with diverse students from all walks of life, such that no two classes are ever alike.

The uniqueness of each class is just one of the challenges that keeps us excited about teaching this course. There are others. Introductory Psychology classes are often full of students who are just beginning their college careers—some are fresh from high school; others are returning, nontraditional students who've been out of the classroom for several years. They come to us with the desire to learn about psychology, but often they face serious obstacles. Some are overworked in their personal lives. Some have lingering academic challenges. And most expect learning to be easier than we know it to be. A big part of our mission is to help students overcome these obstacles and obtain success.

Our Mission: Motivating Students to Read

Getting students to read their textbook in preparation for classes and exams is one of the biggest problems we face as instructors. Like many professors, our experience has been that few students read assigned chapters prior to class, and some even fail to read the chapters by the time they take exams. For years, we have tried various methods of motivating students to read—pop quizzes, reading quizzes, test questions from material in the book but not covered in class, and so on. None of these methods seemed to have much of an impact on students.

Students' free time is in short supply, and when they do have free time, reading a textbook doesn't always seem like an attractive option. Students often find their texts difficult to read, boring, and full of content that is far removed from the concerns of their daily lives. If we want students to read their textbooks, we will have to give them books that they will want to read, and that means giving them a book that they can understand and one that they find relevant enough to be worth the time it takes to read. Motivating students to read is our primary mission, and we wrote *What Is Psychology? Foundations, Applications and Integration* to give students a textbook that they would find interesting to read, easy to read, and memorable.

Our Mission: Giving Students an Integrated View of Psychology that Aligns with APA Guidelines

Another important goal is providing students with a comprehensive and integrated view of the field of psychology. We have long advocated for a "Big Picture" approach to the teaching of psychology, and our previous editions of *What Is Psychology?* emphasized the integrated nature of psychology as a field. Through the use of case studies that were woven throughout the chapters and through continually referring to material in other chapters, *What Is Psychology?* encouraged students to see psychology as a whole rather than as a sum of many parts.

The need to provide Introductory Psychology students with an integrated view of psychology has also been recognized by the American Psychological Association (APA, 2014) in their guidelines for strengthening the Common Core in the Introductory Psychology course. A prominent theme in these guidelines is that all Introductory Psychology courses should present students with a "big picture" view of psychology that integrates the different perspectives that psychologists take in examining mental processes and behavior. Furthermore, in presenting this integrated view of psychology, Introductory Psychology courses should highlight the common themes that tie the different perspectives or areas of psychology together—themes that include the scientific method of research, diversity and variations seen in human behavior, the applicability of psychology to real life, and the ethics that guide psychological research and practice.

This call for a Common Core in introductory courses places the Introductory Psychology course in line with the broader *APA Guidelines for the Undergraduate Psychology Major Version 2.0* (APA, 2013). These guidelines for the major contain the learning goals that students should attain

by the time they complete an undergraduate degree in psychology. Each of these goals is broken down into a series of specific learning outcomes that are divided into two levels. The first level defines goals that students should attain during their first three or four "foundational" psychology courses, while the second level defines goals for what students should achieve by the completion of their degree program. Introductory psychology is clearly often the first foundation course taken by students who may take just a few psychology classes or decide to major in the field. These goals are numerically indexed; for example, the first learning outcome under Goal 1 is Learning Outcome 1.1.

A Summary of the Current APA Learning Goals

Goal 1: Knowledge Base in Psychology

Learning Outcomes 1.1–1.3 pertain to students' acquisition of the key concepts, domains, and applications of psychology.

1.1 Describe key concepts, principles, and overarching themes in psychology
1.2 Develop a working knowledge of psychology's content domains
1.3 Describe applications of psychology

Goal 2: Scientific Inquiry and Critical Thinking

Learning Outcomes 2.1–2.5 pertain to students' understanding and use of the scientific method, information literacy, integrative thinking, and use of sociocultural factors in scientific inquiry.

2.1 Use scientific reasoning to interpret psychological phenomena
2.2 Demonstrate psychology information literacy
2.3 Engage in innovative and integrative thinking and problem solving
2.4 Interpret, design, and conduct basic psychological research
2.5 Incorporate sociocultural factors in scientific inquiry

Goal 3: Ethical and Social Responsibility in a Diverse World

Learning Outcomes 3.1–3.3 pertain to students' understanding and use of ethical standards to build interpersonal relationships and communities.

3.1 Apply ethical standards to evaluate psychological science and practice
3.2 Build and enhance interpersonal relationships
3.3 Adopt values that build community at local, national, and global levels

Goal 4: Communication

Learning Outcomes 4.1–4.3 pertain to students' demonstration of effective writing, presentation, and interpersonal communication skills.

4.1 Demonstrate effective writing for different purposes
4.2 Exhibit effective presentation skills for different purposes
4.3 Interact effectively with others

Goal 5: Professional Development

Learning Outcomes 5.1–5.5 pertain to students' demonstration of the skills and knowledge necessary to meet their career goals in psychology, including self-management skills, project management skills, and the applicability of psychology to various professional pursuits.

5.1 Apply psychological content and skills to career goals
5.2 Exhibit self-efficacy and self-regulation
5.3 Refine project-management skills
5.4 Enhance teamwork capacity
5.5 Develop meaningful professional direction for life after graduation

As professors who also teach advanced courses in psychology, we firmly agree with the APA that students should be taught to see psychology as a unified whole rather than as a series of discrete areas of study. When students enter advanced courses with a unified understanding of Introductory Psychology, they are much more likely to be successful. And students who continue to build this big picture understanding of psychology throughout their coursework are the most successful in attaining their career goals at graduation. For this reason, we are very excited to introduce this new fifth edition of *What Is Psychology? Foundations, Applications, and Integration*. This edition retains the best features from our previous texts that have motivated thousands of students to actually read and learn psychology. Just as the fourth edition focused on strengthening the three themes represented in the subtitle: foundations, applications, and integration, this fifth edition is structured around the guidelines set forth in the *APA Guidelines for the Undergraduate Psychology Major Version 2.0*, and the recommendations made by the APA's Board of Educational Affairs (BEA) Working Group to Strengthen the Common Core. While the APA 2.0 guidelines suggest learning outcomes for college psychology courses, the Common Core proposes an optimal course structure to provide the best introduction to the field of psychology (APA, 2014).

What Is Psychology? Foundations, Applications, and Integration

What Is Psychology? Foundations, Applications, and Integration, 5e retains all the pedagogical features of our previous edition, as well as, new features designed to further strengthen students' mastery of the scientific methods that form the ultimate foundation of our field and help students of all majors see how psychology is relevant to their career development.

Foundations: Content Organized Around the Foundational Areas of Psychological Research

What Is Psychology? Foundations, Applications, and Integration, 5e is organized around the foundational areas of psychology emphasized by the APA in the Common Core discussions. The text opens with the ultimate foundation of psychology, the scientific research methods that inform all study of mental processes and behavior. An understanding of the research methods that psychologists use is essential to building a comprehensive understanding of psychology.

Unfortunately, all too often, students tend to forget the research methods they learn in the first chapter as they are reading and studying subsequent chapters. A common complaint in upper-division courses is that students don't seem to recall basic concepts such as independent and dependent variables, causation vs. correlation, and so on. This edition includes a couple of features that are designed to make the science of psychology salient for students as they read each of the subsequent chapters of the text and give students practice in applying their knowledge of research methods.

The scientific reasoning questions introduced in the fourth edition have been retained. These questions can be found periodically both in the quizzes that follow each section and in the end-of-chapter quizzes, where they are marked with this special icon ◯. These questions are written using concepts relevant to the topics of the chapter, and they give the student the opportunity to review the research methods learned in Chapter 1. For example, a scientific reasoning question from Chapter 4 reads:

> The suprachiasmatic nucleus increases the release of melatonin as it gets darker outside. This represents a _____ correlation between amount of melatonin and amount of daylight.
>
> a. negative
> b. positive
> c. zero
> d. perfect

New to the fifth edition is the inclusion of a *Critical Thinking about the Science of Psychology* feature. At the end of each chapter, students are referred back to a study that was discussed in that chapter and asked to answer questions about the research methods used in that study. An example question from Chapter 6 reads:

> Recall the Bobo doll student conducted by Albert Bandura (1965) that you read about in Section 6.4.1. In particular, think about the first phase of the study, in which the children watched one of the films and were then simply left alone in the room with the Bobo doll. Then, see if you can answer these questions.
>
> 1. What type of research method did Bandura use in this study?
> 2. What was the independent variable in this study?
> 3. What was the dependent variable in this study?
> 4. How did Bandura control for confounding variables in his study?
> 5. Are there any potential ethical concerns with Bandura's study?

By continually reinforcing the content and application of research methods in psychology, these features help students to better understand the science of psychology and to better retain this knowledge as they move forward along their educational pathways.

In addition to understanding the scientific foundations of psychology, students must also master the schools of thought and content areas of psychology that have emerged in our field. Accordingly, the remaining chapters of the text are organized around four foundational content areas: the *biological, cognitive, developmental and social,* and *physical and mental health* areas of psychology. Content is divided to follow these topical sections of psychology while creating manageable chunks of related material, allowing professors to easily align their content with testing during the semester or quarter:

Chapter 1: The Science of Psychology

Part 1: Foundations in Biological Psychology
Chapter 2: Neuroscience
Chapter 3: Sensation and Perception
Chapter 4: Consciousness
Chapter 5: Motivation and Emotion

Part 2: Foundations in Cognitive Psychology
Chapter 6: Learning
Chapter 7: Memory
Chapter 8: Cognition, Language, and Intelligence

Part 3: Foundations in Developmental and Social Psychology
Chapter 9: Human Development
Chapter 10: Social Psychology
Chapter 11: Personality

Part 4: Foundations in Physical and Mental Health
Chapter 12: Health, Stress, and Positive Psychology
Chapter 13: Mental Health Disorders
Chapter 14: Mental Health Therapies

Applications: Integrating Psychology Through the Use of Case Studies

One of the best ways to motivate students to read is to capture their curiosity from the very beginning. If psychology is interesting for students, they will read. Each of our previous texts drew rave reviews from students for the use of attention-grabbing case studies at the opening of each chapter or part. In *Foundations, Applications, and Integration, 5e,* we continue this tradition. Each of the four foundational parts of the text opens with a case study that illustrates how the content covered in the chapters of that part helps us understand the behavior and mental processes of a real-life person. The case studies are compelling stories of people who have faced life's challenges with courage and grace. For example, the biological part opens with the case study of Jean-Dominique Bauby, a man who wrote a moving book that was later turned into a movie, *The Diving Bell and the Butterfly,* while in a state of locked-in syndrome that left him completely paralyzed save the ability to blink his left eye. The developmental and social psychology part begins with the story of Hongyong Baek, a woman who survived many challenges, including the Korean War and devastating personal losses, but still managed many triumphs in her lifetime. Each of the case studies is woven throughout all of the chapters of that part of the book, providing students with a view of the content that is both integrated and applied to real life. By using one case study to tie all of the related chapters together, students are encouraged to see the material as a whole rather than as a series of disparate parts; and in doing so, they begin forming an integrated "big picture" of psychology.

Integration: The Big Picture

To further facilitate the development of an integrated, "big picture" view of psychology in students, each chapter closes with a section called Integrating Psychology: The Big Picture. In this section, we revisit the part case study and use it as a vehicle for both reviewing the content of the chapter(s) of the section and previewing the content of the coming chapter(s). Through *Integrating Psychology: The Big Picture*, students begin to see that all of the material fits together—what has been learned informs what is yet to be learned.

Numerical Indexing Allows for Easy Cross-Referencing

Throughout the text, numeric indexing is used to help students quickly locate relevant information. All primary and secondary heads for the chapter are also numerically indexed with a sequential code. For example, here is the indexing for a portion of Chapter 2 content:

2.1 Billions of Neurons: Communication in the Brain
  2.1.1 The Anatomy of the Neuron
  2.1.2 Signals in the Brain: How Neurons Fire Up
  2.1.3 Jumping the Synapse: Synaptic Transmission

This numeric coding scheme allows for relevant material to be indexed back to the applicable section of the text, tying content to each section heading. Through numbering, the learning objectives, quizzes, review summaries, and visual summaries at the ends of each chapter are easy to reference to a specific location within the text. Numeric coding also makes it easy for instructors to assign specific portions of chapters, and for students to find that material across media, creating a smoother experience when moving around in the physical text or between the text and digital formats. Through the use of these numeric codes, students can quickly tie content from a variety of sources back to specific sections of the text.

Learning Objectives that Are Aligned with the APA Learning Goals and Outcomes

Each chapter opens with the Learning Objectives, which are numerically indexed to the appropriate Learning Goal and Learning Outcome in the *APA Guidelines for the Undergraduate Psychology Major Version 2.0* (APA, 2013). Learning Objectives are also numerically indexed to the section heading of the chapter in which the relevant material is covered. This allows both the instructor and the student to quickly assess which objectives are covered in each discrete section of the text, and which APA program outcomes are being addressed in that section. For example, here is a sample of the learning objectives for Chapter 8. The index numbers on the left refer to the relevant sections of the chapter. The codes on the right relate the learning objectives to the specific APA Learning Outcomes.

8.1 Describe how we represent knowledge in our memory. (APA 1.1, 1.2, 1.3)
8.1 Describe how we organize knowledge in our memory. (APA 1.1, 1.2, 1.3)

8.2 Describe the different types of problems we face in life and the ways in which we may try to solve them. (APA 1.1, 1.2, 1.3)
8.2 Describe common obstacles to problem solving. (APA 1.1, 1.2, 1.3)

Diversity: Making Psychology Relevant for All People

There is little doubt that students learn best when they become personally invested in the material they are reading and studying. However, for this to occur, students must actually find the material to be applicable to their lives. Given that today's college students are a diverse group of people, writing a text that is relevant to today's students means writing a text that embraces their diversity. Diversity and variations in human behavior are also themes that are emphasized in the APA Common Core guidelines and the *APA Guidelines for the Undergraduate Psychology Major*. Understanding psychology means understanding the behavior and mental processes of *all* people.

Appropriately, we wrote our book with inclusion in mind. Throughout the text we use examples of real people (such as those whose stories open each foundational section) who reflect the diversity seen in our classrooms. Where applicable, we have cited and highlighted research that reflects many aspects of diversity, including gender, racial diversity, sexual orientation, cultural diversity, age and generational differences, socioeconomic levels, and physical and/or mental health challenges. In all, we reference people from well over 120 countries and/or cultural groups.

An Engaging Narrative Writing Style Makes Difficult Material Easier to Understand

Motivating a student to read the text is, of course, a primary concern of professors. But reading the text does no good if the student does not understand what they have read. A major goal of this text is to bring psychology to the student by making it understandable, and to do so without sacrificing content. We believe that it is not necessary to condescend to students to get them to understand. Rather, you just have to explain difficult concepts thoroughly and clearly.

Throughout the text, we have adopted an engaging narrative writing style that will not intimidate students. Difficult concepts (such as neural transmission and classical conditioning) are given extended description, and many real-life examples are used to illustrate and clarify our points. The language we use in the text strongly reflects the way we speak to our students during class. We also include a pronunciation glossary so students will know how to correctly pronounce the more difficult, unfamiliar terms.

We attempted to use our prose to tell students the story of psychology, as opposed to a mere litany of theories and research findings. Throughout the text, we directly address students as "you" and refer to ourselves as "we" to help draw students into a conversation about psychology. And through that conversation, we provide students with an accessible and engaging story. Throughout the process of writing this text, many faculty reviewers and students have consistently praised our writing style for its clarity and accessibility. One reviewer commented that it was obvious that this text was written by authors who have spent much time in the classroom in front of students.

Enhancing Motivation and Learning by Making Psychology Practical and Personal

A key point in getting students to read a text and retain what they've read is making the material applicable to their lives. When information is associated with the self, it becomes more easily retrieved from memory. So, when students can see how psychology relates to their personal lives, they are much more likely to find it interesting and a lot less likely to forget it. Throughout the text, we have made a concerted effort to use practical, everyday examples to illustrate the concepts.

What Is Psychology? Foundations, Applications, and Integration 5th edition includes Psychology Applies to Your World, a feature that emphasizes the personal relevance of psychology by showing students that an understanding of psychology can help them to better understand their world. Topics for this feature include the opioid epidemic (Chapter 4), mindsets and motivation (Chapter 5), the modern face of racism (Chapter 10), and the role classical conditioning plays in our body's response to drugs (Chapter 6).

Personal relevance of the material also extends to students' career pathways. At many institutions, introductory psychology is a general education course, as well as, a major course. As such, many of our students are not psychology majors. Unsurprisingly, students often question the value and relevance of psychology to their chosen career pathways. To help students see the value in studying psychology, we have included a **new Psychology Works! feature in the fifth edition**. In each chapter, this boxed feature presents a photo and description of a career that utilizes psychological knowledge. These careers were specifically chosen to be for the most part outside of mainstream psychology and primarily require undergraduate degrees. Some of the Psychology Works! topics included are physical therapist assistants (Chapter 2), law enforcement personnel (Chapter 4), and advertising and marketing personnel (Chapter 10).

Enhancing Student Learning by Encouraging Active Learning and Self-Assessment

Many of our students learn best when they engage in active rather than passive learning. We have made a concerted effort to get students involved with the material as they read. By remaining engaged, students will be more motivated to read, and they will likely retain the information in memory much better. Several features aimed at encouraging active learning include:

Engage Yourself!

The Engage Yourself! active learning feature asks students to do hands-on activities to illustrate important chapter concepts. Active learning not only encourages students to see the personal relevance of the material, it also helps students elaborate the material in memory by connecting it to personal experience. Examples of Engage Yourself! activities include having students examine their attributional biases when making judgments about celebrities (Chapter 10), finding their own blindspot (Chapter 3), and an activity that demonstrates the brain's predisposition to perceive faces (Chapter 9).

Quiz Yourself

Another feature, Quiz Yourself, appears after each major section of the chapter. Quiz Yourself allows students to actively assess their learning by asking them to apply the material of the preceding section to answer several multiple choice questions. Most of the Quiz Yourself questions are application questions that apply the material to practical situations. For example, in Chapter 13, we use the following question to test the student's ability to apply the criteria for determining whether or not behavior is atypical:

> Susan will only eat soup with a fork. By which criteria can Susan's behavior be considered atypical?
>
> a. Danger to others
> b. Violates social norms
> c. Distress
> d. All of the above

To answer this question, the student must not only understand the different criteria for judging behavior, but they must also be able to think analytically in applying these concepts to a behavioral scenario. Scientific reasoning questions can also be found sprinkled throughout the Quiz Yourself quizzes, serving to further help students integrate scientific reasoning into the big picture of psychology. These questions are marked with a circle for easy identification.

You Review

Each chapter features at least one You Review table that summarizes key points of a particular topic. For example, in Chapter 12, the transmission modes, symptoms, and treatments of sexually transmitted infections are summarized. In Chapter 8, the various theories of intelligence are summarized in this feature.

What Do You Know? Assess Your Understanding

In addition to the Quiz Yourself questions at the end of each major section of the chapter, we have included a more extensive self-assessment for students at the end of each chapter. This assessment, What Do You Know? Assess Your Understanding, includes a 20-question multiple choice practice test (with the answers provided) that allows students to evaluate their retention and understanding of the entire chapter. In most cases, these quizzes also contain scientific reasoning questions. By self-assessing, students can better judge which concepts and/or sections of the chapter they should target for further study.

Use It or Lose It: Applying Psychology Questions

In addition to the multiple choice section and the Critical Thinking about the Science of Psychology questions discussed previously, the end-of-chapter assessments also include Use It or Lose It: Applying Psychology, a series of essay or short-answer questions that require students to further elaborate and integrate their knowledge by applying what they have learned to a real-world problem or question. An example question from Chapter 2 reads:

1. Jean-Dominique Bauby was still able to think, feel, and remember the events of his life after a stroke left him in a permanent state of locked-in syndrome. Now that you know something about the brain, can you explain why he retained these abilities?

Are You Getting the Big Picture?

A visual summary of the chapter, entitled "Are You Getting the Big Picture?" is also included in the end-of-chapter material to allow students to grasp the big picture of the chapter. All of the major concepts and theories of the chapter are brought together in a graphical format in the visual summary that also uses thumbnail images as reminders. This tool will be especially helpful to students who prefer to learn through visual means.

Chapter-by-Chapter Changes to Content

As psychologists know, our field is dynamic and ever-changing. To stay abreast of current knowledge and offer our students the most accurate understanding of psychology possible, the research cited in *What Is Psychology? Foundations, Applications, and Integration, 5e* has been

thoroughly updated. In addition, the new edition also includes key updates to some of the pedagogical features of the text. Here is a chapter-by-chapter summary of some of the important changes in this new text.

Chapter 1: The Science of Psychology

- added confirmation bias as a key term
- emphasized the importance of replication and addressed Psychology's replication crisis
- defined and added meta-analyses as a key term
- included operational definition in the discussion of forming a hypothesis
- mentioned the use of crowdsourcing platforms to recruit participants
- included survey results on Generation Z in discussion of generational differences
- added importance of not coercing possible participants to the ethics discussion
- identified review board for non-human subjects (IACUC)
- updated information on undergraduate degrees in psychology
- updated earning inequities for women and minorities in the field of psychology
- included discussion of licensed professional counselors (LPC) and applied behavioral analysis in discussion on careers in psychology
- included a discussion of COVID-19 pandemic and behavior

Chapter 2: Neuroscience

- added coverage of the opioid epidemic
- better integrated the Jean-Dominique Bauby case study into the chapter content
- terminology aligned with the APA dictionary of psychology
- added coverage of mindfulness and the hippocampus
- updated the research on the effects of Wifi exposure on the brain

Chapter 3: Sensation and Perception

- extended coverage of subliminal perception to include subliminal perception of faces in the processing of social cues of emotion
- added one new *Engage Yourself!* demonstration on finding your blindspot
- updated coverage of gender differences in color preference
- added coverage of signal detection theory
- updated coverage of theories of pitch perception to make the text more current and more precise
- updated coverage of taste to make the text more precise
- updated coverage on olfaction and included coverage of gender differences in sensory thresholds for smell
- added the key term of a perceptual set

Chapter 4: Consciousness

- all graphs and statistics updated with the most recent data
- included research on meditation and mindfulness-based practices
- discussed the influence of sleep deprivation on emotions
- explained why REM sleep is often referred to as paradoxical sleep
- included memory theory and continuity hypothesis of dreams as key terms
- discussed the difference between light and deep hypnosis
- *New Psychology Applies to Your World* box on the opioid epidemic
- prescription opiate drugs included in table on psychoactive drugs
- electronic nicotine delivery systems (vaping) included in nicotine discussion
- distinguished between CBD (cannabidiol) and THC (tetrahydrocannabinol)
- discussed COVID-19 syndrome and the benefit of sleep
- discussed vaping and increased risk of COVID-19 outbreak
- described EVALI respiratory disease and its association with vaping

Chapter 5: Motivation and Emotion

- added a new *Psychology Applies to Your World* box on mindsets and motivation
- updated coverage of self-determination theory of motivation
- added additional coverage of ghrelin and weight loss surgery
- increased coverage of sleep deprivation and weight
- updated statistics on the obesity epidemic
- updated information on prevalence of eating disorders
- updated information on basic emotions and facial feedback of emotion

Chapter 6: Learning

- added behavior modification, counterconditioning, instinctive drift, and delay of gratification as new key terms
- added a discussion of the purposiveness of behavior
- better explained the positive learning that can occur through videogame play

- updated the coverage on the Global Initiative to End All Corporal Punishment of Children
- updated research on the effects of viewing television and screen time in children
- added a new *Psychology Applies to Your World* box on the classical conditioning of compensatory responses to drugs

Chapter 7: Memory

- added a new *Engage Yourself!* box on the serial position curve
- added additional coverage on attention and multitasking
- added a new *Engage Yourself*! box on priming.
- extended the coverage on whether or not episodic and semantic memory are separate systems
- reworked our coverage of concussions and added coverage of chronic traumatic encephalopathy in professional football players
- added coverage of the SOAR method of learning, the purported benefit of handwritten notes, and self-testing to the tips for improving memory in the *Psychology Applies to Your World* box

Chapter 8: Cognition, Language, and Intelligence

- reworked and expanded the discussion of group differences in IQ to focus less on the specific differences seen and focus more on research examining the environmental influences on intelligence
- added discussion of the Raven's Progressive Matrices test of intelligence to the discussion of cultural bias in testing
- removed the discussion of gender differences in cognitive abilities from this chapter
- added discussion of biolinguistics and usage-based theories of language development
- added additional examples of possible language use in animals
- added neuroimaging evidence of visual images in memory
- added additional coverage on personality and creativity
- better connected heuristic processing with stereotyping and prejudice
- added coverage of interacting with the problem during problem solving

Chapter 9: Human Development

- distinguished between fetal alcohol spectrum disorder and fetal alcohol syndrome
- included research on infant processing of other-race faces
- included meta-analytic results on parenting styles and association with externalizing problems in children
- updated research on gender and education, and gender and the media
- added research on gender depictions in the video game industry
- updated dating and singlehood, cohabitation, and marriage statistical trends for heterosexual and same-sex couples
- included updated research on gender and marital satisfaction in different-sex and same-sex relationships
- added results from studies on blog posts of terminally ill and last words of death row inmates

Chapter 10: Social Psychology

- added a new *Engage Yourself!* demonstration on attitude similarity to close others
- reworked the *Psychology Applies to Your World* box on prejudice to include a discussion of police violence against people of color and the #Black Lives Matter movement
- included discussion of social psychological principles, such as conformity, and their relevance to the COVID-19 pandemic

Chapter 11: Personality

- thorough update of the literature

Chapter 12: Health, Stress, and Positive Psychology

- chapter retitled to include positive psychology as much of the chapter's content focuses as much on happiness and well-being as physical health
- expanded definition of stress
- expanded discussion of trauma
- included additional research on key factors in resilience
- modified Figure 12.3 on stress response to more accurately reflect biological pathway
- expanded discussion on mindfulness and meditation
- explained difference between hardiness and resilience
- vaping included in discussion of health-defeating behaviors
- expanded discussion of influence of social media on well-being in *Psychology Applies to Your World* box
- included cultural differences in value of happiness
- included how the appraisal process is influenced by culture
- included discussion on COVID-19 stress syndrome

Chapter 13: Mental Health Disorders

- moved away from term "abnormal"; all conditions referred to as mental health disorders

- included discussion of stigma and social stigma
- expanded discussion of gender differences in the prevalence of mental health disorders
- included influence of COVID-19 on mental health
- clarified the difference between normal and excessive anxiety
- included research on the cingulate cortex and anxiety
- added research on variables that put soldiers at risk for posttraumatic stress disorder (PTSD)
- specified criteria for a manic episode

Chapter 14: Mental Health Therapies

- added learning objective for emerging biomedical therapy techniques
- updated statistics on characteristics of people with mental health disorders who seek therapy
- expanded discussion of CBT
- included the key terms of mindfulness-based cognitive therapy (MBCT) and neurosurgery for mental disorder (NMD)
- added a new section on eclectic therapy types
- added a new section on cutting-edge biomedical treatments
- added a table on emerging biomedical therapy techniques
- SNRIs added to discussion of antidepressant medications

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We would also like to thank our friends and colleagues at the University of North Georgia and Valencia College for their support and latitude over the past 20 years. We would also like to thank the thousands of students we have worked with over the years. In your own way, each of you has helped us to become better teachers and better people. Our hope is that this book will touch many other students and foster an interest in and passion for psychology.

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What Is Psychology?

Foundations, Applications & Integration

Learning Objectives

1.1 Define psychology. (APA 1.1)

1.1 Identify common misconceptions about the field of psychology. (APA 2.1)

1.2 Identify the four goals of psychological research. (APA 1.1, 2.1)

1.2 Outline the steps of the scientific method and distinguish between predictive and causal hypotheses. (APA 2.1, 2.4)

1.2 Describe the advantages and disadvantages of observational, survey, correlational, and experimental research methods and the types of conclusions that can be drawn about behavior from each method. (APA 2.1, 2.2, 2.4, 2.5, 5.1)

1.3 Describe the main ethical principles that guide psychologists as they conduct research. (APA 3.1)

1.4 Distinguish among the seven modern perspectives of psychology and the eclectic approach and identify the major historical figures that influenced psychology's development. (APA 1.1, 1.2, 2.1, 2.5, 5.1)

1.4 Describe the training of a psychologist and compare and contrast the different specialty areas of the profession. (APA 1.3, 5.1, 5.5)

1.4 Describe how women and minorities have contributed to the field of psychology. (APA 1.2, 3.3)

Greg Hinsdale/Corbis

1 The Science of Psychology

It was the first day of the semester. Parking, as usual, was a challenge. Christian finally found a spot, parked his car, and headed toward campus. While grabbing a coffee at the college café, he ran into his friend Andrew. "Hey, man, what's up?" he asked. "Not much," Andrew replied. "Just getting coffee before I head to class." "What are you taking?" Christian asked. "Well, I've got math and music appreciation tomorrow. Today, I've got oceanography and general psychology. I'm heading to the psych class now." Christian smiled and said, "Cool, I've got that psych class now, too." The two students grabbed their coffees and headed toward the psychology building, continuing their conversation. "What do you think the course will be about?" Andrew asked. "Probably how you feel about things. Ought to be an easy A—like being with a therapist all semester," Christian joked. Andrew laughed. "Yeah, I guess we'll see how screwed up we are and get a lot of therapy." "Speak for yourself," Christian kidded. "I figure it's just commonsense stuff, things your parents have been telling you since you were a kid. Shouldn't be too hard." Andrew nodded in agreement as they arrived at the classroom. "Let's take a seat in the back so we don't have to share our feelings too much," Christian whispered. The two found a seat in the back and waited for class to begin. ■

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◀ Many students hold misconceptions about the field of psychology.

Chapter Outline

1.1 What Is Psychology?

psychology the scientific study of behavior and mental processes

scientific method a systematic process used by psychologists for testing hypotheses about behavior

Welcome to the world of **psychology**, the scientific study of behavior and mental processes. But what exactly does that include? Behavior includes actions, feelings, and biological states such as sleeping. Mental processes include problem solving, intelligence, and memory, to name just a few. Psychology is a science because psychologists conduct research in accord with the **scientific method**—a systematic process used to test ideas about behavior. Psychologists analyze the behavior of humans as well as other species.

Psychology is probably one of the few disciplines in which students come to the first class believing they already know much about the topic. We see psychologists and psychiatrists on talk shows and listen to them on the radio. We frequently see them depicted on television and in the movies. Many of these portrayals are quite entertaining, but they do not always represent psychology accurately. As a result, the public image of the discipline tends to be distorted.

The purpose of this textbook is to help you develop a deeper understanding of psychology as a science and how the results of psychological research apply to the real world and to your life. In this chapter, we explain what psychologists do, how they think, and where they work. It is a general overview of the field of psychology, an introduction to the more specific areas of psychology discussed in subsequent chapters. We describe how psychology is a science, the goals of psychological research, how psychologists study behavior, and what the field is like today.

Consider, for example, that in December 2019 a new coronavirus emerged causing COVID-19, an acute respiratory disease that quickly spread across the world creating a global pandemic. There was no vaccine or known therapies to treat or reduce its symptoms. As such, all the world *could* do was make significant shifts in behavior. New health norms emerged such as no longer shaking hands, hugging or kissing upon greeting, frequent handwashing and the use of face coverings in public to reduce transmission of the virus from person to person. People were encouraged to socially distance, shelter-in-place, or self-isolate, behaviors counter to humans' need to connect. So, people changed the nature of their social interactions by connecting online, through social media and video conferencing, or by drive-by car parades. Unemployment sky-rocketed. Others now worked from home. Students and teachers acclimated to online or distance learning. These shifts in work and school required family routines to readjust. Intimate relationships were tested as we were forced in close proximity to loved ones for an extended period of time. Mental health was challenged as health fears, self-isolation, and economic hardships increased anxiety, loneliness, and feelings of depression. The enormity of these stressors challenged all of us. Yet, these are all topics and behaviors that psychologists research and study. Psychological science can help us understand these behavioral changes and discuss possible solutions to deal with these changes.

JOHANNES EISELE/Getty Images

▲ Social-distancing became a new behavior in the wake of the COVID-19 pandemic.

This textbook follows the recommendations and guidelines of the American Psychological Association (APA, 2014) by emphasizing a common core structure of contemporary psychology. The chapters are arranged into four main parts representing foundational

areas in the field of psychology: *biological, cognitive, developmental and social psychology,* and *physical and mental health*. Each part begins with a real-life story of a person whose life and experiences illustrate the concepts of the chapters that follow. Each chapter ends with an Integrating Psychology: The Big Picture section that ties together the person's story, the contents of the chapter, and the broader core of psychology. We hope that by reading these real-life stories, you will find psychological topics easier to understand and will be better able to apply psychological principles, concepts, and research to your own life. We also hope you will come to appreciate that understanding the mind and behavior is not a simple process but requires the integration of a multitude of perspectives to more fully comprehend humans' experiences and challenges.

1.1.1 Correcting Common Misconceptions About the Field of Psychology

You are probably reading this book because you have enrolled in a general psychology course. Your expectations of what you will learn have been influenced by your general impressions of psychology. Much of the psychological information presented in the media focuses on practitioners, therapy, and helping others, and you—like the students in the opening section—may have the impression that psychology is all about how you feel and how you can feel better. Although a large proportion of psychologists counsel or otherwise treat clients, most of these professionals hold a doctorate degree in psychology, which required that they study scientific methodology and complete a considerable amount of research (Wicherski, Michalski, & Kohout, 2009).

Psychology is rooted in scientific research. The information in this book is research based. Every idea put forward in the field is subject to scientific study. You will notice that many statements in this text are followed by names and years in parentheses, for example (Pastorino, 2020). These text citations refer to the scientific studies on which the stated conclusions are based, with the researchers' name(s) and date of the study. The complete research citations can be found in the References section at the end of this book. An example of a complete research citation is shown in ● FIGURE 1.1.

A psychologist's explanation of a particular behavior is generally presented as a theory. A **theory** is an explanation of why and how a behavior occurs. It does not explain a particular behavior for all people, but it provides general guidelines that summarize facts and help us organize research on a particular subject.

We all, at times, fancy ourselves as psychologists. We interact with people all the time, we observe others' behaviors, and we have our own personal experiences. Therefore, we might naturally think that we already know a lot about psychology. People often behave the way we think they will behave, so psychology seems as though it is just common sense. We are likely to interpret people's behavior in a way that confirms our expectations—a tendency referred to as the **confirmation bias**. However, we often overlook the examples of behavior or fail to seek out other sources of information that don't confirm our expectations or support our preexisting beliefs. Psychologists systematically test their ideas about behavior using the prescribed methods and procedures we will describe in the next section of this chapter.

theory an explanation of why and how a behavior occurs

confirmation bias a tendency to interpret people's behavior in a way that supports our expectations

APA Style:

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article:

Subtitle of article. *Title of Periodical or Journal*, *Vol* # (Issue #), pages. doi:

Example:

Whitton, S. W., & Whisman, M. A. (2010). Relationship satisfaction instability and depression. *Journal of Family Psychotherapy*, *24* (6), 791–794. doi: 10.1037/a0021734

FIGURE 1.1

Reference Citations in Psychology

The References section at the end of this book lists the complete source for each citation. Here is the APA style format for psychological references. The citation for this particular reference would appear in the text as (Whitton & Whisman, 2010).

Take a look at ● TABLE 1.1 and answer the questions about behavior.

How many of the items did you mark as true? All the statements are false, yet many students have such misconceptions or believe such myths about human behavior despite unsupported or even contradictory psychological research. Psychological findings do *not* always confirm our everyday observations about behavior. Only by objectively measuring and testing our ideas and observations about behavior can we determine which ideas are more likely to stand up to scientific scrutiny. Behavior is much more complex than the simple statements as Table 1.1 suggest. (The chapter designation following each statement indicates where in the text each myth is addressed.)

TABLE 1.1 How Much Do You Know About Behavior?

Indicate whether you believe each statement is true (T) or false (F).	
1. We are either left-brain or right-brain thinkers. (Ch. 2)	T F
2. We have only five senses. (Ch. 3)	T F
3. During sleep, the brain rests. (Ch. 4)	T F
4. Dieting is an effective way to lose weight. (Ch. 5)	T F
5. Punishment is more effective than reinforcement in producing behavior change. (Ch. 6)	T F
6. Our memory works like a video recorder. (Ch. 7)	T F
7. Intelligence is primarily encoded in our genes. (Ch. 8)	T F
8. Most adults experience a midlife crisis in their 40s or 50s. (Ch. 9)	T F
9. Opposites attract. That is, we are most attracted to people who differ from us. (Ch. 10)	T F
10. Personality is set by our teenage years. (Ch. 11)	T F
11. Stress is caused by bad things that happen to you. (Ch. 12)	T F
12. Schizophrenia means you have multiple personalities. (Ch. 13)	T F
13. In order for therapy to be effective, you must confront issues from your childhood. (Ch. 14)	T F

Most students entering a general psychology class, like Christian and Andrew, expect to focus on diagnosing and treating mental health disorders. Although some psychologists specialize in mental health, many others work in academic settings, in the business world, in education, or in government agencies. Psychology is an extremely diverse field, and new specialties are appearing every year. Psychologists are interested in numerous topics, including neuroscience, learning, memory, aging, development, gender, motivation, emotion, sports, criminal behavior, and many other subjects. We cannot cover every area of psychology in this textbook, but we will give you an overview of the main areas of psychological research.

1.1.2 Psychology Will Teach You About Critical Thinking

Because behavior is so complex, psychological theories generally don't definitively explain the behavior of all people. To think like a psychologist, you must think critically, analyzing and evaluating information. You must be able to distinguish true psychological information from **pseudopsychology**. Pseudopsychological findings sound persuasive, but they are not necessarily based on scientific procedures. Their conclusions may go far beyond the scope of their actual data. For example, have you ever heard that people use only 10% of their brains? Many college students believe this false statement despite evidence that shows it is not true (Higbee & Clay, 1998; Lilienfeld, Lynn, Ruscio, & Beyerstein, 2011). To think like a psychologist, you must be skeptical rather than accepting about explanations of behavior.

pseudopsychology psychological information or conclusions that sound scientific but have not been systematically tested using the scientific method

critical thinking thought processes used to evaluate and analyze information and apply it to other situations

Critical thinking involves analyzing and evaluating information and applying it to other situations. Critical thinking also makes you an intelligent consumer of information. You will be encouraged to practice this skill throughout the book as you read the chapter and test your mastery of the material in the Quiz Yourself sections at the end of each main topic and in the What Do You Know? Assess Your Understanding questions at the end of each chapter. In the end-of-chapter material, we have also included Use It or Lose It questions. These short-answer questions ask you to apply your knowledge of psychological research to solve a problem or situation. Immediately following are Critical Thinking about the Science of Psychology questions that require you to analyze a research study to develop and enhance your ability to understand the research methods, concepts, and science underlying psychology.

Because we all engage in behavior, much of the information in this text will apply to your life. We all dream, remember, like or dislike others, are motivated, have high or low self-esteem, experience sadness, behave aggressively, help others, learn, perceive, and use our senses. Consequently, we recommend that you apply the material in this text to your own behavior as much as possible. This connection will increase your interest in the text, and you will study more effectively.

1.1 Quiz Yourself

1. **Which of the following statements is *true*?**
   a. Psychology is just common sense.
   b. Psychologists study only mental health disorders.
   c. Psychologists know why people behave the way that they do.
   d. Psychologists test ideas about behavior according to the scientific method.

2. **Which of the following topics would a psychologist most likely study?**
   a. Weather patterns in Africa
   b. Memory changes in adults
   c. Causes of the Vietnam War
   d. All of the above

3. **Which of the following statements is *not* a pseudopsychology claim?**
   a. Transplant organs carry personality traits that are always transferred from donors to receivers.
   b. Walking on hot coals without burning one's feet requires paranormal abilities.
   c. You can make a blood clot in your brain disappear by humming.
   d. Several studies show a relationship between academic achievement and self-esteem.

Answers 1. d; 2. b; 3. d

1.2 The Science of Psychology: Goals, Hypotheses, and Methods

Though psychologists study and emphasize different aspects of behavior, they all share similar goals. The main goals of psychology and psychological research are as follows:

- To describe behavior
- To predict behavior
- To explain behavior
- To control or change behavior

Description involves observing events and describing them. Typically, description is used to understand how events are related to one another. For example, you may notice that your fitness club or gym tends to get more crowded in the months of January, February, and March. It seems you have to wait longer to use the weight machines or there are more people in the fitness classes. This observation describes an event.

If you observe that two events occur together rather reliably or with a general frequency or regularity, you can make *predictions* about events or anticipate what events may occur. From your observations, you may predict that the fitness club will be more crowded in January. You may arrive earlier to make sure you get a parking spot or a place in the yoga class.

Although it may be known that two events regularly occur together, that doesn't tell us what *caused* a particular behavior to occur. Winter months do not cause fitness clubs to become crowded. These two events are related, but one event does not cause the other. Therefore, an additional goal of psychology is to *explain* or understand the causes of behavior. As stated previously, psychologists usually put forth explanations of behavior in the form of theories. A *theory* is an explanation of why and how a particular behavior occurs. We will detail seven types of explanations, or perspectives, later in the chapter. For example, how do we explain higher fitness-club attendance in the winter months? Is it a behavior that is influenced by the environment? Perhaps fitness clubs are more crowded because the weather makes outdoor exercise more difficult. Perhaps it is more influenced by motivation as many people at the start of a new year resolve to work out more. As these ideas are tested, more and more causes and predictors of behavior are discovered. Some of these explanations or theories will be modified, some will be discarded, and new ones will be developed.

The purpose behind explaining and understanding the causes of behavior is the final goal of psychology, *controlling* or *changing* behavior. It relates to the goal of explanation because one needs to understand what is causing a behavior in order to change or modify it. For example, let's say that the weather is a factor in fitness-club attendance. Fitness clubs could offer outdoor activities beginning in mid-March to prevent declining enrollment. Many psychologists go into the field in the hope of improving society. They may want to improve child care, create healthier work environments, or reduce discrimination in society. Such sentiments reflect the goal of control and underscore the potential impact of good research. ● FIGURE 1.2 summarizes the goals of psychology.

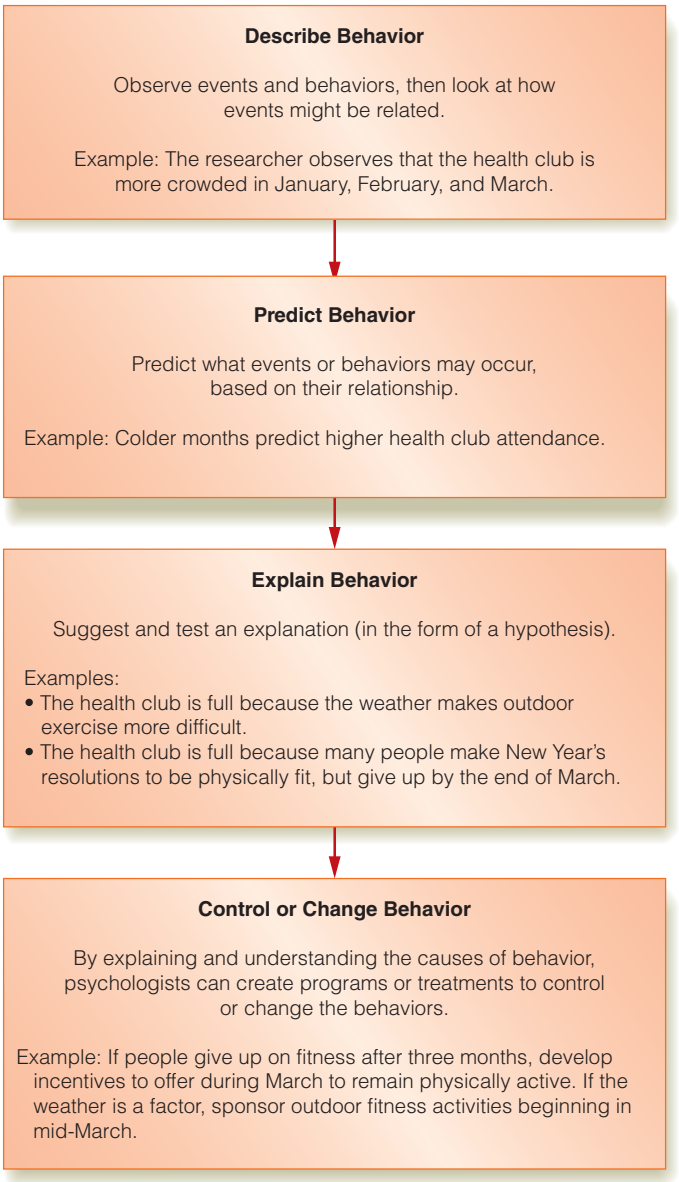


FIGURE 1.2

Goals of Psychology

Psychologists attempt to describe, predict, explain, and ultimately control or change behavior.

1.2.1 Psychologists Are Scientists: The Scientific Method

The purpose of psychological research is to test ideas about behavior. As previously stated, researchers use the *scientific method* when testing ideas about behavior. The scientific method is a set of rules for gathering and analyzing information that enables you to test an idea or *hypothesis*. All scientists adhere to these same steps even though they may use different techniques within each step. The decisions that scientists make at each step of the scientific method will ultimately affect the types of conclusions they can draw about behavior.

How can the scientific method be used to meet the goals of psychology? Let's say that you have an interest in understanding beer drinking among college students. You want to make some predictions (a goal of psychology) about beer drinking. You use the scientific method to test this idea, as outlined in ● FIGURE 1.3.

1. *Define and describe the issue to be studied.* You might hypothesize that college students who buy pitchers of beer tend to drink more than college students who purchase bottles of beer (a **prediction**). You study previous research in scientific journals on alcohol consumption and college students.

prediction an expected outcome of how variables will relate

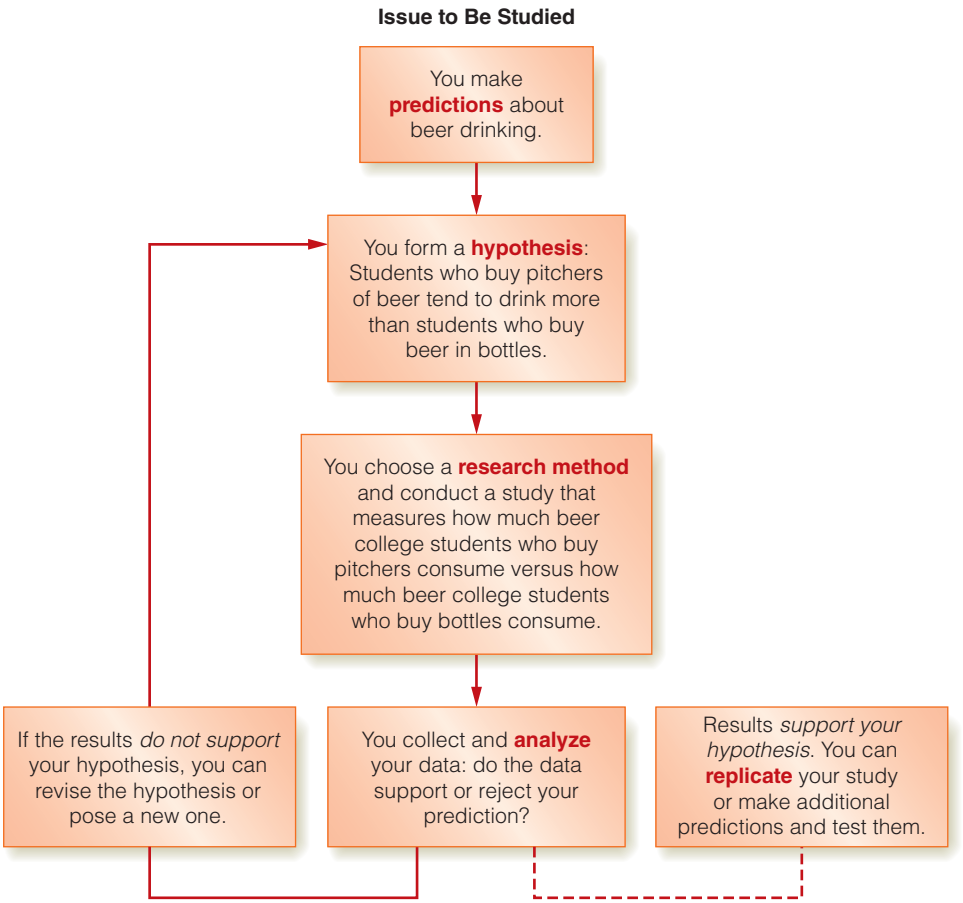


FIGURE 1.3

The Scientific Method

The scientific method enables researchers to test ideas about behavior.

hypothesis an educated guess

2. *Form a testable research hypothesis that states the relationship between the variables.* Students who buy pitchers of beer tend to drink more than students who buy beer in bottles. Your **hypothesis** *operationally defines* or specifies how your variables are being objectively measured—that is, in such a way that another person can test the same hypothesis to verify or replicate your results. In this example, we have operationally defined the method of purchase—bottles versus pitchers, and the second variable being the amount of beer consumed.
3. *Choose an appropriate research strategy.* You choose a group of people to observe (college students) and a research method that allows you to measure objectively how much beer students who buy pitchers drink versus how much beer students who buy bottles drink. You decide where your study will be conducted. Will it be in the environment where the behavior naturally occurs (such as the local college bar) or in a laboratory (a more controlled setting)? You decide who you will use as *participants*. Will you use animals or humans? If humans, how will they be selected? If animals, what species will you use?
4. *Conduct the study to test your hypothesis.* Run the study and collect the data based on the decisions in steps 1–3.
5. *Analyze the data to support or reject your hypothesis.* Researchers usually analyze their data using *statistics* (see Appendix A). If the results do not support your hypothesis, you can revise the hypothesis or pose a new one. If the results do support your hypothesis, you or another team of researchers should *replicate* your study (do the same one again) to increase one's confidence that the findings support the hypothesis or make additional predictions and test them. Geller, Russ, and Altomari (1986) actually included this prediction in a larger study on beer drinking among college students and found support for the hypothesis that buying pitchers was associated with consuming larger amounts of beer.

No matter which goal of psychology you are addressing, the process is the same. The goal merely influences the decisions you make when testing an idea through the scientific method. If your goal is description or prediction, your hypothesis will state what you expect to observe or what relationships you expect to find. Your research strategy will then be designed to measure observations or relationships, and your analysis of the data will employ statistics that enable you to support or reject your hypothesis. It is in this way that the scientific method allows us to test the ideas of psychology.

Findings from one study are rarely adequate, which is why *replicating* or repeating a research study is important to ensure the reliability or consistency of the findings across time, situations, and cultures. Modern psychology is facing a "replication crisis" in that many studies have replicated less often than expected, with only one-third to a half of psychological studies producing similar results in large-scale replication projects (e.g., Klein, Vianello, Hasselman et al., 2018; Laws, 2016). There are many reasons why studies may not replicate, from questionable research practices to a researcher's confirmation bias of finding what they hypothesize. Differences between the original study's sample of participants or the setting in which the study takes place and those of the replication's sample and setting may also account for a failure to replicate findings. Yet, there are also easy solutions such as sharing data for other researchers to analyze; funding, sharing, and publishing replication studies; and using larger samples that can be implemented. One scientific tool that has been particularly

helpful to psychologists is the use of *meta-analyses* (Maxwell, Lau & Howard, 2015). **Meta-analyses** combine the findings from multiple scientific studies on the same question or topic to establish the reliability of the findings, observe any overall trends, and to resolve any discrepancies among the research studies. Both successful and nonsuccessful replications inform our knowledge about behavior and mental processes and are an integral step of the scientific process.

meta-analyses research procedures that combine the findings from a number of scientific studies on the same question or topic to establish the reliability of the findings, observe any overall trends, and to resolve any discrepancies among the research studies

predictive hypothesis an educated guess about the relationships among variables

causal hypothesis an educated guess about how one variable will influence another variable

1.2.2 Psychologists Ask Questions: Hypotheses

As you have seen, one of the first steps of the scientific method is to formulate a question or hypothesis about behavior. These hypotheses generally fall into one of two categories: *predictive hypotheses* and *causal hypotheses*.

A **predictive hypothesis** makes a specific prediction or set of predictions about the relationships among variables. Such hypotheses are used to address two goals of psychology: description and prediction. The previous example on beer drinking among college students illustrated a predictive hypothesis: The study predicted that students who buy pitchers of beer tend to drink more than students who buy beer in bottles. Predictive hypotheses are made when the researcher measures the variables of interest but does not manipulate or control the variables in the study. Because the researcher does not control the variables, conclusions of research studies that test predictive hypotheses are limited. The conclusions can only state what was observed or which variables appear to be related to one another. They cannot be used to draw cause-and-effect conclusions; that is, one cannot conclude that buying pitchers of beer causes a person to drink more beer. To determine the cause, you must form and test a *causal hypothesis*.

A **causal hypothesis** specifically states how one variable will influence another variable. Causal hypotheses can be tested only when the researcher is able to control or manipulate the main variables in a study. The researcher sets up different conditions in a study and then observes whether there is a change in behavior because of the different conditions. For example, suppose a researcher has developed a new strategy to teach children how to read. The researcher hypothesizes that this program will cause greater gains in reading than the standard method for teaching reading. This is a causal hypothesis. Some students are assigned to the new reading program, and others are assigned to the standard program. The researcher then measures the children's gains in reading at the end of the year to see whether there is a difference. As you will soon see, causal hypotheses can only be tested by means of an *experiment*. To test a causal hypothesis, a researcher must be able to conclude how one variable affects or causes a change in another variable.

1.2.3 Psychologists Strategize: Sampling and Research Methods

Once you have stated a hypothesis, the next step in the research process is to decide on a research strategy and a way of selecting participants. The type of hypothesis you make (predictive or causal) typically determines which research methods you can use. You are more likely to use some research methods to test predictive hypotheses and other methods to test causal hypotheses.

Naturalistic observations, case studies, surveys, and *correlational research* are used to test predictive hypotheses. All of these methods are used when the researcher cannot control or manipulate the main variables in the study. Each method has its advantages and disadvantages, which we will discuss in a moment.

Selecting Participants

population of interest the entire universe of animals or people that could be studied

sample the portion of the population of interest that is selected for a study

naturalistic observations research studies conducted in the environment in which the behavior typically occurs

In a perfect world, researchers would include every person they are interested in studying. This is termed the **population of interest**. For example, for a psychologist who studies infant development, all infants would be the population of interest. It is impossible to test everyone, however, so researchers select a portion, or subset, of the population of interest called a **sample**. Because the sample will be used to make inferences or judgments about the entire population, the sample should reflect the whole population as much as possible; that is, it should be a *representative sample*. Random sampling of participants helps ensure a representative sample. In a *random sample*, every member of the population has an equal chance of being selected to participate in the study; this avoids introducing *sampling bias* into the research.

The more representative the sample is, the more the results will generalize (or apply) to the population of interest. But random sampling is not always possible. Instead, psychological research often uses *samples of convenience*, or groups of people who are easily accessible to the researcher. The students in your psychology course are a sample of convenience. In fact, much psychological research relies on using college students as the sample of convenience! According to Current Population Survey results from the U.S. Census Bureau (2018) around 35% of people in the United States over the age of 25 have a college degree or higher, so samples of college students probably do not represent all types of people and groups. As such, these nonrepresentative samples limit a researcher's ability to generalize their findings to the population (Levenson, 2017).

In addition, online psychology labs at well-known universities across the United States as well as online crowdsourcing platforms, such as Amazon's Mechanical Turk (MTurk) and TurkPrime, are now much more common ways to recruit participants. On the plus side, researchers conducting online research have the distinct advantage of soliciting a larger and more diverse sample at a fraction of the cost, with improved efficiency and data storage (Gosling & Johnson, 2010; Litman, Robinson, & Abberbock, 2017). Thousands to millions of participants from all over the world may be gathered over the Internet as opposed to a few hundred that can be collected on-site. Several classic findings in psychology have been successfully replicated online, while other replications found a discrepancy between laboratory results and online results (Crump, McDonnell, & Gureckis, 2013; Miller, Crowe, Weiss, Maples-Keller, & Lynam, 2017). Recall that the people you get to participate in your study are very important to the conclusions of your study. However, Internet research does not ensure a representative sample. Some people do not have access to a computer or may not know how to use the Internet. Participants might be distracted or watching a movie while clicking answers on a survey. People who complete online research may be different in some way from people who are less willing to complete online research that presents an alternative explanation for one's results. Moreover, researchers may not be able to ensure that participants are who they say they are (Dance, 2015; Gosling & Mason, 2015; Ophir et al., 2020). People can more easily falsify their identity on the Internet than they can in person, calling into question the "true" characteristics of the sample that is generated.

Naturalistic Observations

Naturalistic observations are research studies that are conducted in the environment in which the behavior typically occurs. For example, Campos, Graesch, Repetti, and others (2009) wanted to investigate when and in what manner dual-earner families interact after work. The researchers measured interaction by observing

and video-recording dual-earner couples and their children in their homes throughout two weekday afternoons and evenings. The researcher in a naturalistic study is a recorder or observer of behavior who then describes or makes predictions about behavior based on what they have observed. Because the researcher does not control events in a naturalistic study, it is not possible to pinpoint the causes of behavior. Therefore, naturalistic studies are predominately used to achieve the goals of description and prediction. In their observational study, Campos et al. found that although both mothers and fathers were likely to be greeted with positive behavior from family members, mothers spent more time with children, whereas fathers spent more time alone.

Jonathan Goldberg/Alamy stock photo

▲ A school playground could be an environment for naturally observing children's behaviors

While naturalistic observation can provide a picture of behavior as it normally occurs, researchers need to consider the influence of *reactivity*. Suppose you want to study childhood aggression by observing students on a school playground. What might happen if you were to simply enter the playground, sit down, and start writing about what you saw? The children might behave differently because of your presence and/or their awareness that they are being observed; as a result, your observations of aggression might not be reliable or true. When conducting a naturalistic observation, researchers attempt to minimize reactivity to ensure that they are observing the true behavior of their participants. Collecting unobtrusive (not noticeable) and objective records of naturalistic behavior can also be achieved through smart-home devices and mobile-sensing devices such as smartphones, smart watches, and fitness trackers (Nelson & Allen, 2018).

Case Studies

A **case study** is an in-depth observation of one or a few participants or settings. The participant may be a person, an animal, or even a setting, such as a business or a school. As with naturalistic observation, in case studies researchers do not control any variables but merely record or relate their observations. Case studies provide in-depth information on rare and unusual conditions that we might not otherwise be able to study. However, the main disadvantage of the case study method is its limited applicability to other situations. It is very difficult to take one case, especially a rare case, and say that it applies to everyone. In other words, case studies lack **generalizability**; therefore, the conclusions that are drawn from case studies are limited to the participant being studied.

Surveys

Often, psychologists want to study a whole group of people but in less depth. **Surveys** can accomplish this task by asking a large group of people about their attitudes, beliefs, and/or behaviors. A large group of people can quickly respond to questions or statements in their homes, online, over the phone, or out in public.

Survey data are used to make predictions and test predictive hypotheses. For example, knowing which people are more likely to buy a product enables a company to market its products more effectively and perhaps devise new strategies to

case study an in-depth observation of one or a few participants or settings

generalizability [jen-er-uh-lies-uh-BILL-uh-tee] how well a researcher's findings apply to other individuals and situations

surveys research methods that ask a large group of people about their attitudes, beliefs, and/or behaviors

target individuals who are not buying them. Similarly, knowing which behaviors are related to a higher frequency of illness enables a psychologist to predict who is more at risk for physical illness or a mental health disorder. However, *who* you ask to complete a survey and *how* you ask them are critical elements in distinguishing good survey research from biased research. Recall that a random sampling of participants minimizes sampling bias. The more representative the sample is, the more the results will generalize to the population of interest.

A second critical element of the survey method is how the questions are worded. A respondent has to be able to understand the question and interpret it in the way the researcher intended. It is important to make questions clear and precise to obtain accurate estimates of people's feelings, beliefs, and behavior. For example, differences in survey question wording have been found to have an influence on rape estimates (Fisher, 2009), pornography use (Regnerus, Gordon, & Price, 2016), and estimates of adolescent sexual behaviors (Santelli et al., 2000).

In summary, surveys are advantageous in that they allow psychologists to ask a lot of questions to a large sample of people. Accurate information can be gathered in a relatively short period of time. Yet the survey's wording, the representativeness of the sample, and whether people choose to answer the questions honestly can bias the results.

For example, the Pew Research Center (2014) set out to compare the values, attitudes, and behaviors of Millennials (adults born between 1981 and 1996) with those of older adults by using the survey method, with a nationally representative sample of 1,821 adults. Not surprisingly, they reported differences among the groups in behaviors associated with the use of technology. For example, 55% of Millennials reported having posted a "selfie" on a social media site, compared to 24% of Generation Xers (those born between 1965 and 1980), 9% of Baby Boomers (those born between 1946 and 1964), and 4% of the Silent generation (those born before 1946). Eighty-one percent of Millennials had created a profile on a social media account.

Surveys on Generation Z or Gen Z (those born between 1997 and 2010) show similar attitudes to the Millennials with both generations more likely to support same-sex marriage and interracial marriage than older generations. However, Gen Zers are more likely than Millennials and older generations to report that they know someone who prefers gender-neutral pronouns (Pew Research Center, 2018). Gen Zers also are less likely to binge drink alcohol, date, or have had sex than Millennials did at that age. Yet, socially, Gen Zers spend less time interacting with their peers face-to-face and more time alone than any previous generation (Twenge, 2017).

What accounts for these reported differences? Survey research cannot explain the differences; it can be used only to describe and predict behavior. However, we can generate multiple hypotheses as to why these generational differences may occur. They could be due to the unique historical circumstances or social movements experienced by each generation, such as wars or technological advances. They could be due to changing social roles, longer life expectancies, varying economic factors, or to some combination of these factors. Also keep in mind that there are as many differences within generations as there are among them. Yet, from this survey research, we get a glimpse of the attitudes, values, and behaviors of the varying generations.

Correlational Studies

correlation [cor-ruh-LAY-shun] the relationship between two or more variables

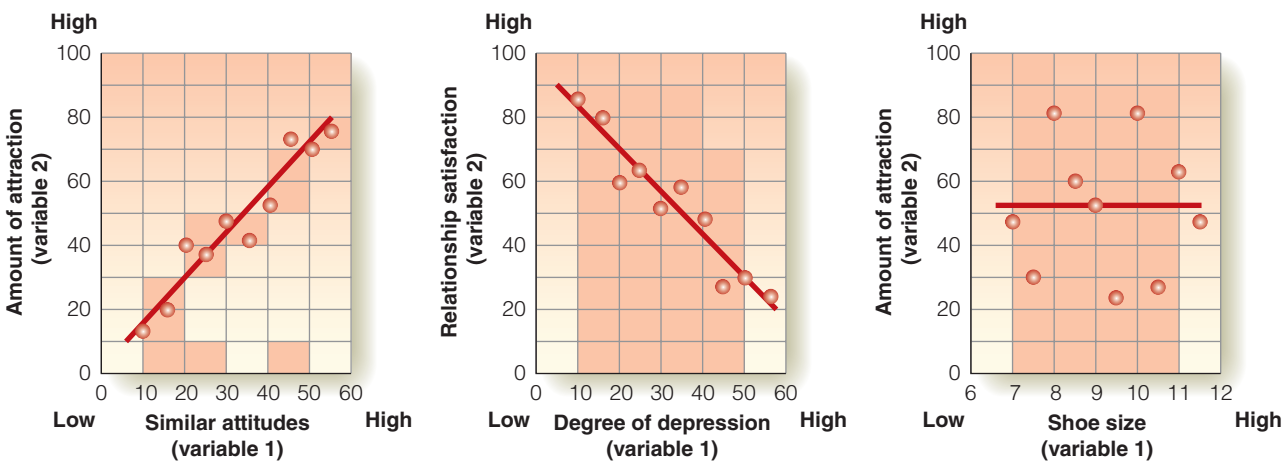
Correlational studies test the relationship, or **correlation**, between two or more variables—television watching and violent behavior, or depression and gender, for example. The researcher does not control variables but rather measures them

to see whether any reliable relationship exists between them. For example, if we were to measure your weight (one variable), what other variable might show a relationship to your weight? Your height? Your calorie consumption? The amount of exercise you engage in? Your age? Your life expectancy? If you were to measure all these variables, you might find that all of them vary in relation to weight. These relationships are correlations.

The strength of a correlation is measured in terms of a *correlation coefficient*—a statistic that tells us how strong the relationship between two factors is. Correlation coefficients range from −1.00 to +1.00. The closer the correlation coefficient is to −1.00 or +1.00, the stronger the correlation, or the more related the two variables are. A −1.00 or a +1.00 is a *perfect correlation;* the value of one variable always exactly predicts the value of the other variable. For example, every time people get angry, they hit something. The closer the correlation coefficient is to 0, the weaker the correlation—that is, one variable does not reliably predict the other. A *zero correlation* coefficient means that there is no linear relationship between the two variables—for example, how many movies you watch in a month and the color that your walls are painted. To illustrate correlation, let's look at a study by Hays and Roberts (2008) on eating behaviors and weight gain in older women. They found a +.25 correlation between weight gain and overeating in response to daily life circumstances. The correlation between weight gain and overeating in response to emotional states, such as anxiety and depression, was +.17. The higher correlation between weight gain and daily overeating opportunities suggests that ordinary environmental food cues such as television commercials, billboards, or available sweets are a better predictor of weight gain in older women than is "emotional eating." Generally, the stronger the correlation between two variables, the more accurate our predictions are, but perfect (+1.00 or −1.00) correlations rarely happen in psychology. Human behavior is too complex for such perfect relationships to occur.

The sign before the correlation coefficient tells us how the variables relate to one another (● FIGURE 1.4). A **positive correlation** means that as one variable increases, the other variable also tends to increase; or as one variable decreases, the other variable tends to decrease. In both cases, the variables are changing in the

positive correlation a relationship in which increases in one variable correspond to increases in the other variable



(a) Positive correlation **(b)** Negative correlation **(c)** No correlation

FIGURE 1.4

Correlation

Correlation, a research method used for description and prediction, shows how two variables are related.

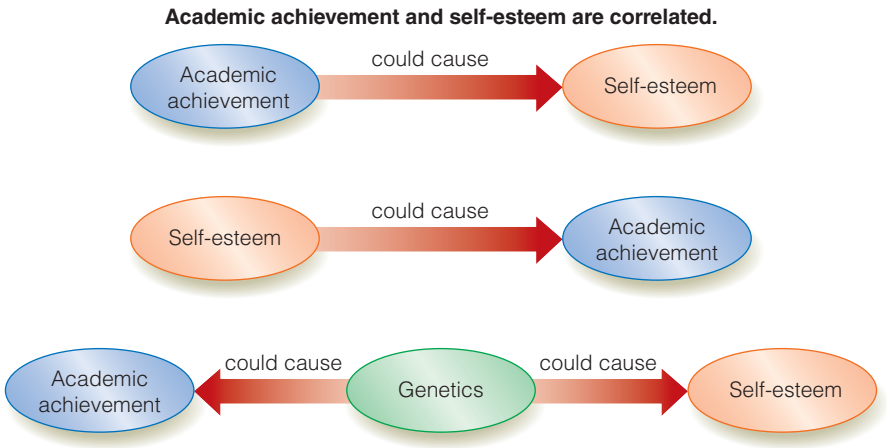


FIGURE 1.5

Correlation Does Not Mean Causation

When two variables are correlated or related, it does not mean that we know why they are related. It is possible that a third variable, not measured in the study, is the real cause of the relationship between the two measured variables. Correlation can only be used for making predictions, not for making cause-and-effect statements.

same direction. An example of a positive correlation is perceived stress and blood pressure. As perceived stress increases, so does one's blood pressure.

In a **negative correlation**, as one variable increases, the other variable tends to decrease in what is referred to as an *inverse* relationship. Notice that the variables are changing in *opposite* directions. An example of a negative correlation is video game playing and school competence. The more time children spend playing video games, the poorer their competence is at school (Hastings et al., 2009). Or consider the negative correlation between relationship satisfaction and depression. As relationship satisfaction increases, feelings of depression decrease (Whitton & Whisman, 2010).

Correlational studies enable researchers to make predictions about behavior, but they do *not* allow us to draw cause-and-effect conclusions (● FIGURE 1.5). For example, there is a positive correlation between academic achievement and self-esteem. Students who have high academic achievement also tend to have high self-esteem. Similarly, students who have low academic achievement tend to have low self-esteem. High academic achievement may cause an increase in self-esteem. However, it is just as likely that having high self-esteem causes one to do better academically. There may be a third variable, such as the parents' educational level or genetics, which actually causes the relationship between academic achievement and self-esteem. A correlational study does not tell us which of these explanations is correct. The only research method that may permit us to draw cause-and-effect conclusions is the experiment.

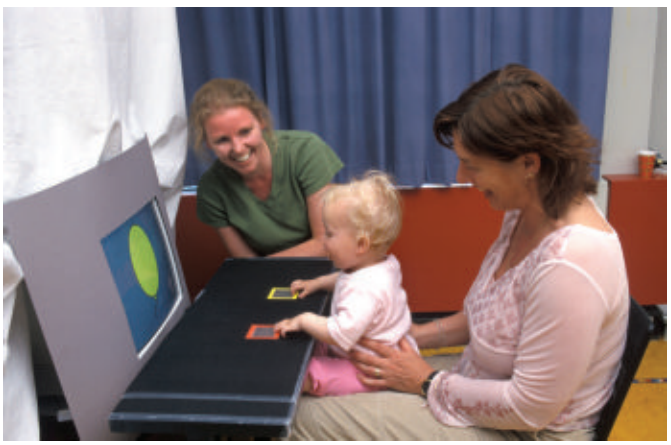
negative correlation a relationship in which increases in one variable correspond to decreases in the other variable

experiment a research method that is used to test causal hypotheses

independent variable the variable in an experiment that is manipulated

Experiments

Although several types of research methods are used to test predictive hypotheses, only one research method can test a causal hypothesis: the **experiment**. We will discuss several features of the experiment, including its advantages and disadvantages.



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▲ By studying behavior in a lab environment, researchers are better able to control the variables in an experiment.

Necessary Conditions for an Experiment Two main features characterize an experiment. First, the variables in the study are controlled or manipulated. Second, participants are randomly assigned to the conditions of the study. When these two conditions have been met, causal conclusions *may* be drawn. Let's first turn our attention to the issue of experimenter control.

The point of the experiment is to manipulate one variable and see what effect this manipulation has on another variable (● FIGURE 1.6). These variables are termed the *independent* and *dependent variables*, respectively. The **independent variable** is the variable that the experimenter manipulates; it is the *cause* in the experiment, what the researcher is testing.

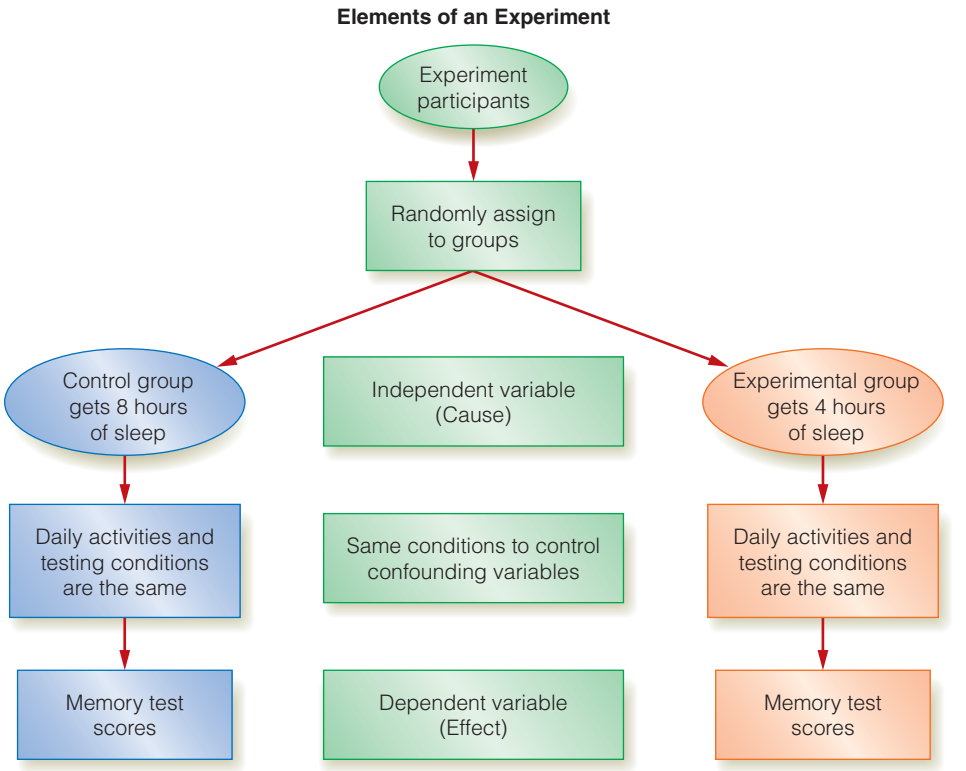


FIGURE 1.6

Elements of an Experiment

The two main ingredients of an experiment are (1) that the variables in the study are controlled or manipulated and (2) that participants are randomly assigned to the conditions of the study. When these two conditions have been met, causal conclusions *may* be drawn.

It is independent of or not being affected by the other variables in the study. The **dependent variable** measures any result of manipulating the independent variable; it is the *effect* in the experiment. It is dependent on or influenced by the other variables in the study.

The typical experiment divides participants into two types of groups: the *experimental group* and the *control group*. The **experimental group** includes those participants who receive the manipulation that is being tested. The **control group** includes those participants who do not receive the manipulation that is being tested; they serve as a baseline comparison for the experimental group. Both groups are then measured on the dependent variable to see whether there is a difference between the groups.

In some experiments, the control group receives a *placebo,* or inactive substance such as a sugar pill, rather than being given nothing. This procedure is to control for the *placebo effect*. The **placebo effect** occurs when participants show changes simply because they believe or expect a treatment to have certain effects. In **double-blind studies**, neither experimenters nor participants know who is receiving a placebo and who is receiving the actual treatment; they are *blind* to which group (experimental or control) a person has been assigned. In this way, neither the participant's nor the experimenter's expectations will bias the results.

Suppose, for example, that we want to study the effects of sleep deprivation. Specifically, we hypothesize that sleep deprivation causes deficits in memory. This is a causal hypothesis that can be tested with an experiment. We decide to

dependent variable the variable in an experiment that measures any effect of the manipulation

experimental group the group of participants who receive the manipulation that is being tested

control group the group of participants who do not receive the manipulation that is being tested

placebo effect a measurable change in participants' behavior due to the expectation or belief that a treatment will have certain effects

double-blind studies experiments in which neither the experimenters nor the participants know to which group (experimental or control) participants have been assigned

manipulate the amount of sleep participants receive to see whether it has any effect on memory. In this experiment, we are interested in one's amount of sleep. Other variables do not influence the amount of sleep because we are going to control the amount of sleep to see whether one's memory depends on how much sleep one receives. Therefore, memory is "dependent" and sleep is "independent" for the purposes of this experiment. Some participants (the control group) will be allowed to sleep 8 hours per night for the week of our study. Others (the experimental group) will be allowed to sleep only 4 hours each night. The experimenter has set, or controlled, the amount of sleep (the independent variable) at two levels: 8 hours and 4 hours. Each day of our study, we measure the participants' memory (the dependent variable) by having them complete several memory tasks. At the end of the study, we compare the memory scores of those participants who received 8 hours of sleep (the control group) with those who received only 4 hours of sleep (the experimental group).

confounding variables factors other than the independent variable that affect the dependent measure

random assignment a method of assigning participants in which they have an equal chance of being placed in any group or condition of the study

To be sure that it is the amount of sleep affecting memory and not something else, we need to be sure that we have controlled any variables (other than the independent variable) that may influence this relationship. These potentially problematic variables are called **confounding variables**. What confounding variables might we need to control? Maybe age influences one's memory or how one handles sleep deprivation. If either of these is true, we would want to control the age of our participants. We also would want to make sure that participants had not used any substances known to affect memory or the sleep cycle prior to their participation in the experiment. Consequently, we would control for this variable, too. Whereas independent variables are controlled by manipulating them to vary with at least two values, confounding variables are controlled by trying to hold them at a constant value so the outcomes of the study cannot be attributed to them.

Both groups must be treated the same except for the amount of sleep they receive, so the researcher sets the conditions of the experiment to be the same for both groups. For example, every participant should complete the memory tasks at the same time of day, and every participant should complete the same memory tasks. The criteria for scoring the memory tasks must be the same as well. The instructions for completing the tasks must be the same. The lighting, temperature, and other physical features of the room in which the participants sleep and complete the memory tasks should be the same for all participants. Our purpose is to design a study in which we manipulate the independent variable to see its effect on the dependent variable. If we control any potentially confounding variables that might influence this relationship and we find a difference between our groups on the dependent variable, that difference is most likely due to the independent variable, and we have established a cause-and-effect relationship.

If the experimenter does not control a confounding variable, we now have more than one variable that could be responsible for the change in the dependent variable: the independent variable and the confounding variable. When this occurs, the researcher is left with an alternative explanation for the results. The change in the dependent variable could have been caused by the independent variable, but it also could have been caused by the confounding variable. Consequently, causal conclusions are limited.

Let's not forget the second condition necessary for an experiment—how participants are assigned to the conditions of the independent variable. We must be sure that there are no differences in the composition of our groups of participants. Psychologists eliminate this problem through **random assignment** of participants to the conditions of the study. In our example on sleep and memory, assigning all

the males in the sample to the 4-hour sleep condition and all the females to the 8-hour sleep condition would create a confounding variable. Gender differences might have an effect on memory scores. It may be that gender (the confounding variable) rather than sleep deprivation (the independent variable) is the cause of a difference in memory. To eliminate the influence of such confounding variables, experimenters randomly assign participants to conditions. Each participant has an equal chance of being placed in either condition. Male participants are just as likely to be assigned to the 4-hour condition as they are to the 8-hour condition, and the same is true for female participants. In this way, any participant variable that has the potential to influence the research results is just as likely to affect one group as it is the other. Without random assignment, confounding variables could affect the dependent variable. This is typically what occurs in *quasi-experiments*.

A **quasi-experiment** is in some ways like an experiment. The researcher manipulates the independent variable and sets the other conditions to be the same for both groups. However, the second requirement for an experiment—randomly assigning participants to conditions—has not been met. Quasi-experiments use existing groups of people who differ on some variable. For example, suppose you want to see if vaping during pregnancy causes lower-birth-weight babies. For ethical reasons, you cannot assign some pregnant women to vape and prevent others from vaping. Instead, for your vaping condition, you must select pregnant women who already vape. These women may differ on other variables when compared to pregnant women who do not vape. For example, their eating habits may differ. As a result, a confounding variable (the diet of the mothers) rather than vaping could cause a difference in the dependent variable (the birth weight of the offspring). Because quasi-experiments do not meet the conditions necessary for a "true" experiment, causal conclusions based on these designs should be made cautiously (Shadish, Cook, & Campbell, 2002; West, 2009).

quasi-experiment a research study that is not a true experiment because participants are not randomly assigned to the different conditions

Advantages and Disadvantages of Using Experiments Experiments have several advantages. First, it is only through experimentation that we can approach two of the goals of psychology: explaining and changing behavior. An experiment is the only research method that enables us to determine cause-and-effect relationships. This advantage makes interpreting research results less ambiguous. In an experiment, we attempt to eliminate any confounding variables through experimenter control and random assignment of participants to groups. These techniques enable us to draw clearer conclusions from research results.

Experiments also have disadvantages. First, experiments do not address the first two goals of psychology: describing and predicting behavior. These are often the first steps in understanding behavior, and naturalistic observation, surveys, and correlational studies are quite useful for doing this. Second, in an attempt to control confounding variables, experiments conducted in laboratory settings may create an artificial atmosphere. It is then difficult to know whether the same result would occur in a more natural setting or whether the findings from a lab environment generalize to the real world. This may be another reason to conduct naturalistic observations or correlational studies. Third, sometimes employing the experimental method is simply not possible for ethical or practical reasons. As we mentioned in the case of quasi-experimental designs, we cannot force people to be randomly assigned to a condition that could harm them (such as vaping) or that does not pertain to them (such as having high blood pressure). Psychologists must follow certain ethical guidelines and practices when conducting research. We turn our attention to this topic next. You Review: Scientific Research Methods summarizes the strengths and weaknesses of the various research methods.

YOU REVIEW Scientific Research Methods

Method	Strengths	Weaknesses
Naturalistic Observation Observing behavior in the environment in which it typically occurs	Describes behavior as it typically occurs in the real world. May test predictive hypotheses.	Little control of variables. Reactivity can influence results. Cannot show cause and effect.
Case Study In-depth observation of one or a few participants or settings	Detailed information on one person or setting. May describe people or settings with special or rare abilities, qualities, or characteristics.	May not generalize to other people or settings. Cannot show cause and effect. Difficult to replicate.
Survey Asks a large group of people about their attitudes, beliefs, and/or behavior	Efficient collection of data with large samples. Can ask a lot of questions at once. Can test predictive hypotheses.	Participants may not answer truthfully. Question wording can bias results. Cannot show cause and effect.
Correlation Measures the relationship between two or more variables	Can measure the strength and direction of relationships between variables. Can test predictive hypotheses.	Does not randomly assign participants to conditions. Cannot show cause and effect.
Quasi-experiment Compare participants who are not randomly assigned on the manipulation of an independent variable	Allows comparisons of treatments. Can control some conditions of study. May test causal hypotheses.	Does not randomly assign participants to conditions. Causal conclusions are difficult to make.
Experiment Manipulate an independent variable to see changes in a dependent measure under controlled conditions	Allows random assignment of participants to conditions. May eliminate confounding variables. Can show cause and effect.	For ethical and practical reasons, may not be able to test some variables. Results may not apply to real-world settings.

1.2 Quiz Yourself

1. When we know that two events regularly occur together, which goal of psychology can be met?
   a. Predicting behavior
   b. Changing behavior
   c. Understanding behavior
   d. Explaining behavior

2. Dr. Hincapie wants to test the hypothesis that stress increases one's blood pressure. What type of hypothesis is Dr. Hincapie interested in testing?
   a. Predictive
   b. Causal
   c. Correlational
   d. Biological

3. In an experiment on attitudes, participants are given either positive or negative information about a speaker and then asked to evaluate the effectiveness of the speaker. In this experiment, which is the independent variable?
   a. The effectiveness of the speaker
   b. The type of information the participant is given
   c. Attitude change
   d. The speaker

4. The more hours that students work, the less successful they are academically. This is an example of what type of correlation?
   a. zero
   b. positive
   c. perfect
   d. negative

5. Dr. Duarte is studying bullying behavior in children. Every day, Dr. Duarte goes to the local playground at 3 p.m., sits on the sidelines, and records the number of times one child bullies another, the sex of the children involved in the bullying, and the duration of the bullying. Dr. Duarte is using which research method in this study?
   a. An experiment
   b. A case study
   c. A naturalistic observation
   d. A quasi-experiment

Answers 1. a; 2. b; 3. b; 4. d; 5. c

1.3 Ethical Principles of Psychological Research

Generally, psychologists associated with universities and colleges in the United States cannot conduct research unless their research proposal has passed review by an **Institutional Review Board (IRB)** (or human research ethics committees [HRECs] in other countries). The function of the IRB or HREC is to ensure that the research study being proposed conforms to a set of ethical standards or guidelines.

Institutional Review Board (IRB) a committee that reviews research proposals to ensure that ethical standards have been met

informed consent the ethical principle that research participants be told about various aspects of the study, including any risks, before agreeing to participate

confidentiality the ethical principle that researchers do not reveal which data were collected from which participant

1.3.1 Ethical Guidelines for Participants

The American Psychological Association (APA), one of the main professional organizations for psychologists, has taken the lead in establishing ethical guidelines, or professional behaviors that psychologists must follow. These guidelines, the "Ethical Principles of Psychologists and Code of Conduct" (APA, 2002), address a variety of issues, including general professional responsibility, clinical practice, psychological testing, and research. Here, we look at the guidelines psychologists must follow when conducting research with humans and animals. The ethical duties of psychologists who treat clients are discussed in Chapter 14.

One of the main concerns of the IRB is to ensure that the proposed research has met the ethical guideline of respect and concern for the dignity and welfare of the people who participate (APA, 2002). Researchers must protect participants from any potential harm, risk, or danger as a result of their participation in a psychological study. If such effects occur, the researcher has the responsibility to remove or correct these effects.

Another fundamental principle of ethical practice in research is **informed consent**. Researchers inform potential participants of any risks during the informed consent process, wherein the researcher establishes a clear and fair agreement with research participants prior to their participation in the research study (APA, 2002). This agreement clarifies the obligations and responsibilities of the participants and the researchers and includes the following information:

- The general purpose of the research study, including the experimental nature of any treatment
- Services that will or will not be available to the control group
- The method by which participants will be assigned to experimental and control groups
- Any aspect of the research that may influence a person's willingness to participate in the research
- Compensation for or monetary costs of participating
- Any risks or side effects that may be experienced as a result of participation in the study

Potential participants cannot be coerced or forced to take part in a study. Possible participants are also informed that they may withdraw from participation in the study at any time, and they are informed of any available treatment alternatives. In addition, the researcher agrees to maintain **confidentiality**. Personal information about participants obtained by the researcher during the course of the investigation cannot be shared with others unless explicitly agreed to in advance by the participant or as required by law or court order. It is also a good idea to obtain participants' consent for sharing data with other researchers, institutions, or other entities (Meyer, 2018).

Online research and data collection from mobile-sensing devices presents unique ethical challenges (Eynon, Schroeder, & Fry, 2009; Harari et al., 2016; Solberg, 2010). Psychologists have a duty to maintain the confidentiality and privacy of participants' data and personal information. When researchers collect information about users without their active participation (such as from social media profiles or smartphones),

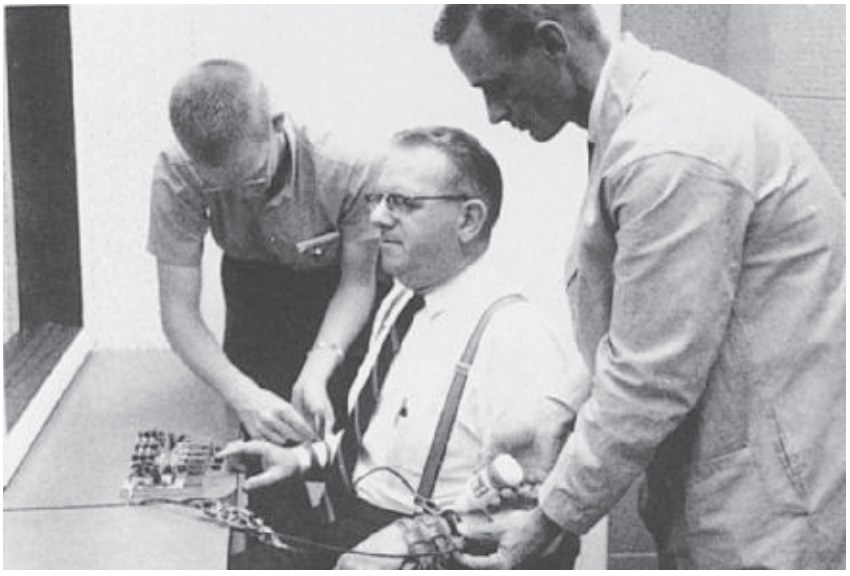
users must be adequately informed and give consent. Researchers may or may not consider security as part of their data collection plan or may not have the necessary training to implement electronic security. In such cases, researchers may need to consult technical experts to ensure the security of online information. Even with the best security, databases may still be compromised. Many universities and professional organizations have developed policies and procedures to address these issues.

It is not always possible to fully inform participants of the details of the research, as it may change their behavior. For this reason, psychologists sometimes use *deception* in their research. For example, suppose we wanted to research student cheating. If we tell participants we are studying cheating behavior, it will likely influence their behavior. If we tell participants we are investigating student-teacher behavior, we can measure student cheating more objectively. However, the use of deception must be justified by the potential value of the research results. Moreover, deception can be used only when alternative procedures that do not use deception are unavailable.

If participants have been deceived in any way during the course of a study, the researcher is obligated to *debrief* participants after the experiment ends. **Debriefing** consists of full disclosure by the researcher to inform participants of the true purpose of the research. Any misconceptions that the participant may hold about the nature of the research must be removed at this time.

debriefing the ethical principle that participants be fully informed of the nature of the study after participating in research involving deception

Consider the following classic research study. In the 1960s, Stanley Milgram (1963) set out to determine whether the average person could be induced to hurt others in response to orders from an authority figure. (You will read more about Milgram's research in Chapter 10.) Participants were deceived into believing that they were participating in a research study on learning rather than on obedience. Participants were told that they would be playing the role of a "teacher" in the experiment. Participants were introduced to a "learner" who was then led to a separate room. The teacher's job was to administer electric shocks to the learner every time the learner made a mistake in an effort to help the learner better retain a list of words. In reality, the participant was not actually shocking the learner. The learner's responses were prerecorded on a tape, but the participants did not know this and believed that they were, indeed, shocking the learner.



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▲ Although Stanley Milgram debriefed his participants, he still caused them psychological harm. Such a study would violate current ethical standards of psychological research.

Despite the fact that participants believed the learner to be ill or worse, most of them continued to follow the experimenter's orders. A full 65% of the participants shocked the learner all the way up to the highest shock level! During the procedure, Milgram's participants exhibited emotional distress. Although Milgram debriefed the participants after the study, he still violated the ethical principle of psychological harm. He was criticized for exposing participants to the trauma of the procedure itself and for not leaving the participants in at least as good a condition as they were prior to the experiment (Baumrind, 1964). Because of these ethical problems, a study such as this would not be approved today.

We should also note that for years the primary focus in research was on White males. Women and minorities were not only discouraged from becoming professionals in psychology but also were largely ignored or

neglected when studying psychological issues. Many minority and female, as well as male, psychologists have contributed to the field of psychology by addressing these shortcomings and designing research that looks specifically at the behaviors of minorities and women.

1.3.2 Ethical Guidelines for Nonhuman Research

Animal studies have advanced our understanding of many psychological issues, including the importance of prenatal nutrition, our treatment of brain injuries, and our understanding of mental health disorders (Domjan & Purdy, 1995). Psychologists must meet certain standards and follow ethical guidelines when conducting research with nonhuman subjects. Whereas IRBs evaluate the ethics of research using human participants, psychological research using nonhuman subjects must also be approved by a review board called an *Institutional Animal Care and Use Committee* (*IACUC*). Animals must be treated humanely and in accord with all federal, state, and local laws and regulations. Researchers are responsible for the daily comfort, housing, cleaning, feeding, and health of nonhuman subjects. Discomfort, illness, and pain must be kept at a minimum, and such procedures can only be used if alternative procedures are not available. Moreover, harmful or painful procedures used on animals must be justified in terms of the knowledge that is expected to be gained from the study. Researchers must also promote the psychological well-being of some animals that are used in research, most notably primates (APA, 2002).

1.3 Quiz Yourself

1. **What is the rule for deceiving participants in a psychological research study?**
   a. Deception is never allowed in psychological research. It is against the law in every state.
   b. Deception is allowed only when using nonhuman subjects.
   c. Deception is allowed when alternative procedures are unavailable and when participants are debriefed at the end of the study.
   d. Deception can be used under any circumstances.

2. **Dr. Kwan is performing case study research. Dr. Kwan should be most concerned with which of the following ethical principles?**
   a. Deception
   b. Physical harm
   c. Debriefing
   d. Confidentiality

3. **Which of the following is *not* an ethical guideline that psychologists must follow when conducting research?**
   a. Paying participants for their participation
   b. Informed consent
   c. Freedom from harm
   d. Confidentiality

Answers 1. c; 2. d; 3. a

1.4 Psychology in the Modern World: Foundations and Growth

Psychology has been described as having "a long past but only a short history" (Ebbinghaus, 1910, p. 9). Traditionally, psychology's birth is linked with the first psychology laboratory, which was established by Wilhelm Wundt (1832–1920) in 1879 at the University of Leipzig, in Germany. Wundt wanted to know what conscious thought processes enable us to experience the external world. In particular, Wundt attempted to detail the *structure* of our mental experiences. Wundt's view that mental experiences were created by different elements is referred to as **structuralism**, a term coined not by Wundt but by his student Edward Titchener (1867–1927).

structuralism an early psychological perspective concerned with identifying the basic elements of experience

History and Art Collection/Alamy Stock Photo

▲ The first woman to be awarded a doctorate in psychology was Margaret Washburn.

To identify the structure of thought, British psychologist Titchener used a process known as **introspection**, a self-observation technique. Trained observers were presented with an event and asked to describe their mental processes. The observations were repeated many times. From these introspections, Titchener identified three basic elements of all conscious experiences: sensations, images, and feelings.

Wundt's and Titchener's research went beyond introspection and structuralism to encompass a very broad view of psychology. They also conducted detailed studies on color vision, visual illusions, attention, and feelings, and influenced the field of psychology through their students, many of whom went on to establish psychology departments and laboratories in the United States. For example, Titchener's first graduate student, American Margaret Washburn (1871–1939), became the first woman to earn a doctorate in psychology. Washburn did not share Titchener's emphasis on structuralism, but she instead investigated the connection between motor movement and the mind and conducted extensive research on animal behavior.

1.4.1 Psychology's Roots and Modern Perspectives

introspection observing one's own thoughts, feelings, or sensations

biological perspective an approach that focuses on physical causes of behavior

neuroscience a field of science that investigates the relationships between the nervous system and behavior/mental processes

Like Washburn, other psychologists soon reacted against the limited view of the mind that structuralism presented. Such disagreement gave rise to other ways to explain behavior, which resulted in a very broad profession. Here we discuss seven perspectives or views on behavior and the historical figures that influenced their development (● FIGURE 1.7): *biological, evolutionary, psychodynamic, behavioral, sociocultural, humanistic,* and *cognitive*. We will also look at a combined perspective referred to as an *eclectic approach*.

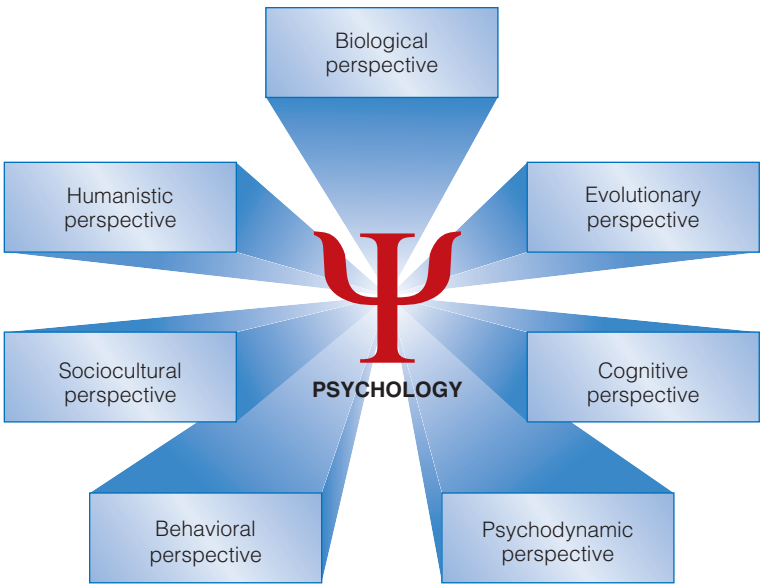

FIGURE 1.7

Psychological Perspectives

Just as a photograph or a piece of art can be examined from many different angles, so too, can mental processes and behavior. We call these angles *perspectives*. Each offers a somewhat different picture of why people behave as they do. Taken as a whole, these perspectives underscore the complex nature of behavior.

The Influence of Medicine

Because of the mind's association with the body, much of what we consider psychology today was at times part of the field of medicine. Hippocrates (460–377 BCE), the father of medicine, believed that personality was in part a reflection of the mix of chemicals in the body, and abnormal behavior was typically treated with medical procedures. The ancient Indian texts of knowledge, *The Vedas* (2000–600 BCE), describe *chakras* or energy processing centers within the body that govern physical, mental, emotional, and spiritual health.

Today, psychologists who adopt a **biological perspective** look for a physical cause for a particular behavior. Such psychologists examine genetic, biochemical, and nervous system (brain functioning) relationships to behavior and mental processes. The biological perspective is also a branch of science referred to as **neuroscience**. (We discuss the physical processes of the nervous system in Chapter 2.) For example, electroencephalographs (EEGs) and other brain imaging and computer technology have enabled neuroscientists to measure how a person's body movements cause nerve cells in the brain to fire. They can then use this information to design neuromotor prosthetic devices, such as robotic arms, that work in much the same way. These appliances can help replace or restore lost motor

functioning in people with spinal cord injuries, stroke, and other severe motor deficits (Athanasiou et al., 2017).

The Rehabilitation Institute of Chicago (RIC)

▲ By studying biological processes, neuroscientists can design neuromotor prosthetic devices such as robotic arms to help restore lost motor functioning.

From Functionalism to Evolution

American psychologist and philosopher William James (1842–1910) had visited Wundt's laboratory in Germany but did not share Wundt's focus on breaking down mental events into their smallest elements. Rather, James proposed a focus on the wholeness of an event and the impact of the environment on behavior. He emphasized *how* a mental process operates as opposed to the *structure* of a mental process. He came to believe that consciousness and thought evolved through the process of natural selection, to help the organism adapt to its environment (Nielsen & Day, 1999). *Evolution* and *natural selection* were ideas that were quite new at the time. Evolution refers to the development of a species—the process by which, through a series of changes over time, humans have acquired behaviors and characteristics that distinguish them from other species. Natural selection refers to how only the organisms best suited to their environment tend to survive and reproduce. James wanted to know how a particular behavior helps an organism adapt to its environment and thereby increases its chances of surviving and reproducing. James's perspective on psychology became known as **functionalism**. According to James, if human behavior is naturally selected, it is important for psychologists to understand the *function,* or survival value, of a behavior.

Today, psychologists may adopt an **evolutionary perspective**. The evolutionary perspective proposes that natural selection is the process that explains behaviors. Behaviors that increase your chances of surviving are favored or selected over behaviors that decrease your chances of surviving. Like James's functionalism, this approach analyzes whether a particular behavior increases a person's ability to adapt to the environment, thus increasing the chances of surviving, reproducing, and passing one's genes on to future generations (Buss, 2009).

Bettmann/Contributor/Getty Images

▲ William James is associated with functionalism.

An Emphasis on the Unconscious

Sigmund Freud (1856–1939) is probably the best-known historical figure in psychology, and his ideas can be found throughout Western culture in music, media, advertising, art, and humor—a testament to his influence and importance. Before creating theories of psychology, however, Freud studied medicine, focusing on neurology and disorders of the nervous system. He began studying people with all kinds of "nervous" disorders, such as an intense fear of horses or heights or the sudden paralysis of an arm. He began asking patients to express any and every thought that occurred to them, no matter how trivial or unpleasant. Freud theorized that encouraging patients to say whatever came to mind allowed them to recall forgotten memories that seemed to underlie their problems. This process, known today as *free association*, is one element of *psychoanalysis*, a therapy that Freud developed.

From these experiences, Freud came to believe that the *unconscious* plays a crucial role in human behavior. For Freud, the unconscious was that part of the mind that includes impulses, behaviors, and desires that we are unaware of but that influence our behavior. Until this time, much of psychology had focused on conscious mental processes. Freud's focus on the unconscious was unique and led to his formulation of **psychoanalytic theory**. According to this theory, humans are similar to animals in that they possess basic sexual and aggressive instincts that motivate behavior. However, unlike animals, humans can reason and think, especially as they mature. In childhood we learn to use these conscious reasoning abilities to deal with and to suppress our basic sexual and aggressive desires so

functionalism an early psychological perspective concerned with how behavior helps people adapt to their environment

evolutionary perspective an approach that focuses on how evolution and natural selection influence behavior

psychoanalytic theory Sigmund Freud's view that emphasizes the influence of unconscious desires and conflicts on behavior