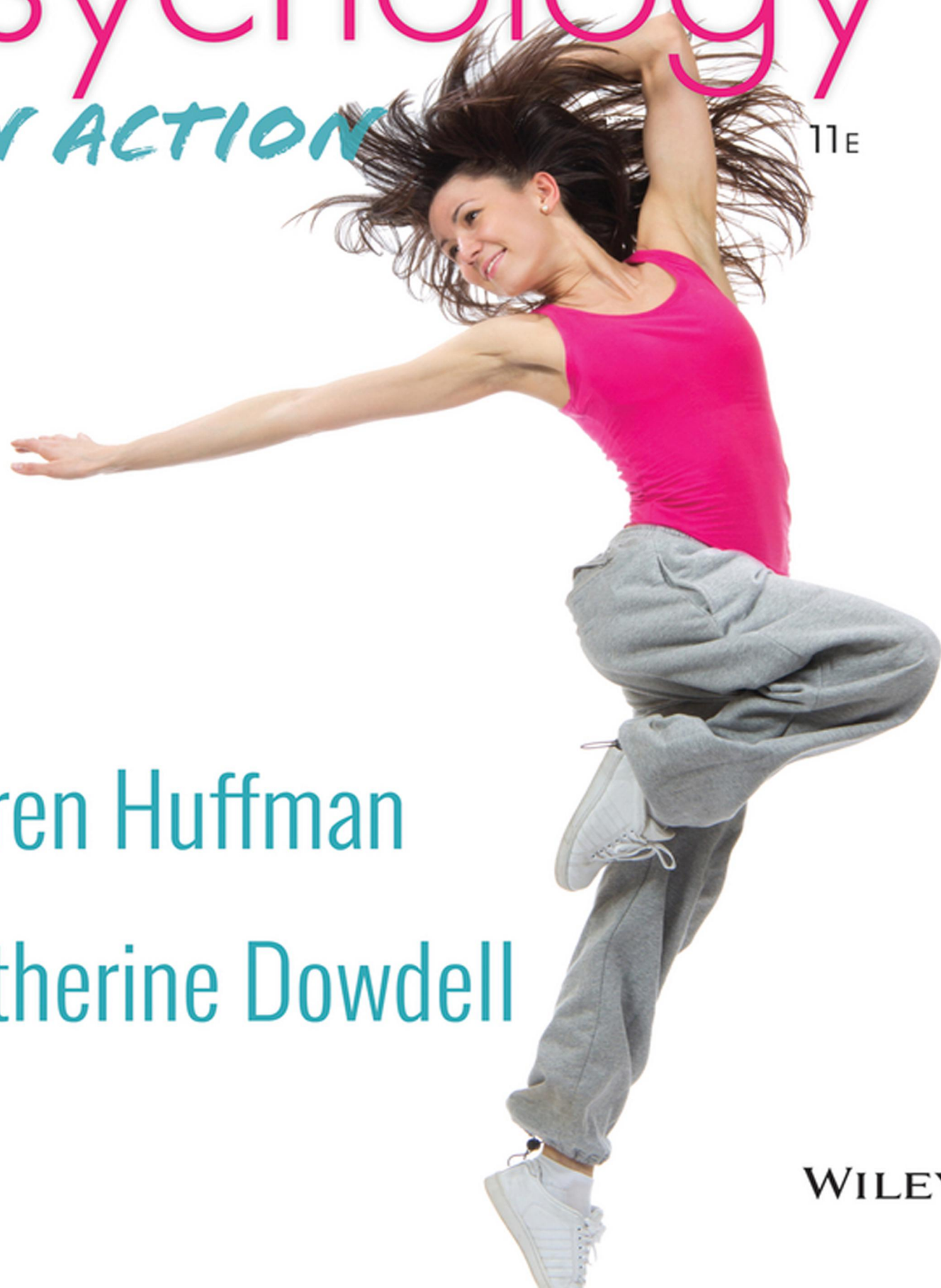# psychology

in action

11E

Karen Huffman

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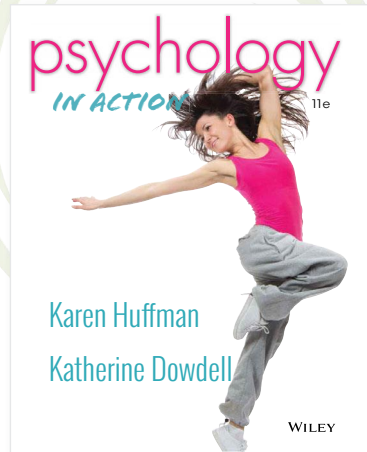Pre-loaded, ready-to-use assignments and presentations created by subject matter experts

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Psychology in Action, 11TH EDITION

MEET THE AUTHORS

KAREN HUFFMAN is an emeritus professor of psychology at Palomar College, San Marcos, California, where she taught full-time until 2010 and served as the psychology student advisor and co-coordinator for psychology faculty. Huffman has received the National Teaching Award for Excellence in Community/Junior College Teaching given by Division Two of the American Psychological Association (APA), and many other awards and accolades. Huffman is the author of several textbooks including Visualizing Psychology, and Real World Psychology.

AND NEW TO THE 11TH EDITION...

KATHERINE DOWDELL is a professor of psychology at Des Moines Area Community College in Iowa, where she teaches courses in introduction to psychology, abnormal psychology, lifespan development and social psychology. She also currently serves as District Chair for Social & Behavioral Sciences. Professor Dowdell received her BA in Psychology from the University of Pennsylvania, and her MS in Clinical Psychology from the University of Pittsburgh.

Professor Dowdell began working with Karen Huffman and the Wiley Psychology team as a Wiley Faculty Network mentor in 2007. She has taught and mentored faculty on best practices and the use of technology in teaching. She has conducted numerous online presentations and live workshops. As a decade-long user of WileyPLUS, Professor Dowdell has served as a development consultant on everything from WileyPLUS functionality, to video content, instructional design, user-experience and faculty training.

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Karen Huffman
Palomar College

Katherine Dowdell
Des Moines Area Community College

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Preface

"The journey is the treasure."

—Lloyd Alexander, The Golden Dream of Carlo Chuchio

We're thrilled that you have decided to join us on this journey through the fascinating field of psychology! We truly believe that psychology can enrich and improve virtually every aspect of our lives—work, play, home, college, national and international affairs, as well as our everyday interactions with others. But with such a large and complex field of study, this journey can be overwhelming. With a combined 50+ years of guiding students through introduction to psychology, we've discovered some of the very best 'travel tips' to ensure a successful, productive, and personalized journey that will engage and inspire you, the professor, and your students.

Our theme for this eleventh edition of *Psychology in Action*, "**A personal journey through psychology,**" continues our previous focus and strengths, active learning and student engagement, while emphasizing and incorporating all the elements of a well-planned journey.

- *A natural progression from point-to-point.* From the chapter overviews through the end-of-chapter enrichment activities, students are carefully guided through the course content.

- *Guideposts and signs leading the way.* Any traveler wants to be sure to hit the 'must see' destinations, but students often become confused about what's important to know. ***Psychology in Action*** includes streamlined, in-text features that reduce distractions, while focusing student attention on the most important concepts.

- *Room for exploration and self-discovery.* This edition of ***Psychology in Action*** builds on the already strong foundation of engaging students through opportunities to '*Try This Yourself*' — exercises designed to apply psychological principles to current events, media moments and personal experiences.

- *Something to take home or write home about.* By emphasizing active learning, inspiring engagement, and personalizing the journey through psychology, students will find

numerous "take home messages" to enrich their personal lives, as well as exciting topics that provide much to talk about with family and friends.

EXCITING, EVIDENCE-BASED, NEW FEATURES As in all previous editions, we've continued our well-known, evidence-based, self-testing features, such as *Test Yourself* review sections after each major head in the chapter, *Research Challenges*, and *Critical Thinking* exercises throughout each chapter. However, in this latest, eleventh edition, we've also included three NEW features in the end-of-chapter *Psychology Enrichment Activities* sections. These new features offer students additional guidance and feedback throughout their journey in psychology:

1. Each chapter ends with a NEW *Media Challenge* focused on popular Internet blogs, social media, and/or media reports, which helps students interpret their validity and reliability and to recognize how these reports have been filtered through a media lens.

2. Because the book is organized into chapters to match the subfields of psychology, it can be difficult for students to see how the material in one chapter is related to content throughout the text. Therefore, each chapter now includes a NEW feature, *Looking Back/Looking Ahead*, to help students see connections from concepts already covered to those yet to come.

3. In addition, feedback from instructors around the country shows that most students turn first to the end of the chapter to check out what they need to study. Therefore, we replaced the traditional end of chapter narrative summaries, which may mislead students into thinking they know more than they actually do, with a NEW feature—15 application quiz questions. These questions not only provide a general chapter summary, they also raise student awareness of all the material they need to study in order to perform well on chapter exams.

Furthermore, recent research shows that practice testing is one of the most effective study techniques (e.g., Dunlosky et al., 2013).

We hope you enjoy sharing this journey through psychology with us! We'd love to hear about your thoughts and experiences with *Psychology in Action, 11e*. Please contact us: Karen Huffman (khuffman@palomar.edu) and Katherine Dowdell (kdowdell@dmacc.edu).

Teaching and Learning Program

Psychology in Action, 11e is accompanied by a full menu of materials designed to facilitate the mastery of psychology.

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Instructors can:

- assign activities and add their own materials;

- guide students through what's important in the e-textbook by easily assigning specific content;

- set up and monitor collaborative learning groups;

- assess student engagement; and

- benefit from a sophisticated set of reporting and diagnostic tools that give greater insight into class activity.

WileyPLUS Learning Space is equipped with an interactive learning module called ORION. Based on the latest findings in cognitive science, ORION provides students with a personal, *adaptive* practice experience, which adapts the educational material according to their specific learning needs. With this individualized, immediate feedback, students can build on their strengths, overcome their weaknesses, and maximize their study time.

ORION is great as:

- an adaptive **pre-lecture tool** that assesses your students' conceptual knowledge so they to come to class better prepared;

- a **personalized study guide** that helps students understand their strengths, as well as areas where they need to invest more time, especially in preparation for quizzes and exams.

Unique to ORION, students begin their study of each chapter with a quick diagnostic test. This test provides invaluable feedback to each student regarding his or her current level of mastery for the chapter's key terms and contents. It also identifies specific areas where students need additional study.

Learn more at www.wileypluslearningspace.com. If you have questions, please contact your Wiley representative.

Additional Instructor Resources Available with WileyPLUS Learning Space

WileyPLUS Learning Space provides reliable, customizable resources that reinforce course goals inside and outside of the classroom. It also allows students instant, 24/7 adaptive learning and feedback on their individual progress, while allowing instructors to quickly analyze both individual and overall class results.

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- **NEW The Authors Speak: Chapter Preview Videos**, featuring authors Karen Huffman and Katherine Dowdell, provide students with a brief preview of each chapter's 'coming attractions,' as well as personal examples and anecdotes to inspire, engage, and motivate students.

- **More than 30 Tutorial Videos,** featuring authors Karen Huffman and Katherine Dowdell, provide students with explanations and examples of some of the most challenging concepts in psychology. These 3- to 5-minute videos reflect the richness and diversity of psychology, from the steps of the experimental method to the interaction of genes and our environment, to the sources of stress.

- **20 Virtual Field Trips** allow students to view psychological concepts in the real world—as they've never seen them before. These 5- to 10-minute virtual field trips include visits to places such as a neuroimaging center, a film studio where 3-D movies are created, and a sleep laboratory, to name only a few.

- **More than 50 Wiley Psychology Videos** are available, which connect key psychology concepts and themes to current issues in the news.

- **15 Wiley Psychology Animations** have been developed around key concepts and themes in psychology. The animations go beyond what is presented in the book, providing additional visual examples and descriptive narration.

- **More than 20 visual drag-and-drop exercises** allow students a different, and more interactive, way to visualize and label key structures and important concepts.

   Ready-to-go teaching materials and assessments help instructors optimize their time:

- NEW VISUAL Instructor's Guide to Classroom Demonstrations Videos, prepared by Melissa Patton, Eastern Florida State College, provides instructors with a visual, step-by-step guide illustrating how to incorporate engaging and relevant classroom demonstrations for each chapter.

- The **Instructor's Manual,** prepared by Ronn Newby of Des Moines Area Community College, is carefully crafted to help instructors maximize student learning. It provides teaching suggestions for each chapter of the text, including lecture starters, lecture extensions, classroom discussions and activities, out of the classroom assignments, Internet and print resources, and more!

- **Lecture PowerPoint™ Presentations,** prepared by Nicholas Greco of Columbia College of Missouri, Lake County Campus, and Katie Townsend-Merino of Palomar College, provide a combination of key concepts, figures and tables, and examples from each chapter of the textbook.

- **Media Enriched PowerPoint™ Presentations,** also prepared by Nicholas Greco and Katie Townsend-Merino, are only available in *WileyPLUS.* They contain up-to-date, exciting embedded links to multimedia sources, both video and animation, and can be easily modified according to your needs.

- **Instructor's Test Bank,** prepared by Stuart Silverberg of Westermoreland County Community College, is available in Word document format, or in a very simple, but effective, computerized format, called *Respondus.* Instructors can easily alter existing questions and answer options, or add new ones. They also can create multiple versions of the same test by quickly scrambling the order of all questions found in the Word version of the test bank. The test bank has over 2000 multiple choice questions, including approximately 10 essay questions for each chapter (with suggested answers). Each multiple-choice question has been linked to a specific, student learning outcome, coded as "Factual" or "Applied," and the correct answer is provided with section references to its source in the text.

- **Gradebook:** *WileyPLUS* provides instant access to the latest reports on trends in class performance, student use of course materials, and progress toward learning objectives, helping inform decisions and drive classroom discussions.

   For more information on what WileyPLUS Learning Space can do to help your students reach their potential, please visit **www.wileyplus.com**

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- **Chapter exams,** prepared by Kate Halverson of Des Moines Area Community College, give students a way to easily test themselves on course material before exams. Each chapter exam contains page referenced, fill-in-the-blank, application, and multiple-choice questions. The correct answer for each question is provided, which allows immediate feedback and increased understanding. All questions and answers are linked to a specific learning objective within the book to further aid a student's concept mastery.

- **Interactive flashcards** allow students to easily test their knowledge of key vocabulary terms.

- **Handbook for non-native speakers** clarifies idioms, special phrases, and difficult vocabulary, which has a documented history of significantly improving student performance—particularly for those who do not use English as their first language.

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   Psychology in Action, 11e is ready for immediate customization with two supplementary chapters not part of the standard text: Chapter 17: *Industrial/Organizational Psychology*, and Chapter 18: *Psychology at Work in the Global Economy*. Visit wiley.com/college/custom to review these chapters today.

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Acknowledgments

Reviewers: To the professors who reviewed material and who gave their time and constructive criticism, we offer our sincere appreciation. This text is much stronger, clearer, and tighter thanks to their efforts. We are deeply indebted to the following individuals, and trust that they will recognize their contributions throughout the text.

Mary Beth Ahlum, *Nebraska Wesleyan University*; Roxanna Anderson, *Palm Beach State College*; Susan Antaramian, *Christopher Newport University*; Darin Baskin, *Lone Star College*; Matthew Bell, *Santa Clara University*; Barbara Boccaccio, *Tunxis Community College*; Amy Bradshaw Hoppock, *Embry-Riddle Aeronautical University*; Courtney Brewer, *Suffolk County Community College*; Melissa Brown, *State University of New York, College at Brockport*; Michael Cassens, *Irvine Valley College*; Wanda Clark, *South Plains College*; Herb Coleman, *Austin Community College*; Lorry Cology, *Owens Community College*; Rosalyn Davis, *Indiana University, Kokomo*; Ben Denkinger, *Augsburg College*; Michael Dudley, *Southern Illinois University, Edwardsville*; Sylvia Edwards-Borens, *Texas State Technical College, Waco*; Daniella Errett, *Pennsylvania Highlands Community College*; Rebecca Ewing, *Central Georgia Technical College*; Linda Fayard, *Mississippi Gulf Coast Community College*; Johnathan Forbey, *Ball State University*; Jamie Franco-Zamudio, *Spring Hill College*; William Fry, *Youngstown State University*; Janet Gebelt, *Westfield State University*; William Goggin, *University of Southern Mississippi*; Jill Haasch, *Elizabeth City State University*; Kate Halverson, *Des Moines Area Community College*; Becky Howell, *Forsyth Technical Community College*; Vivian Hsu, *Rutgers, The State University of New Jersey*; Dominique Hubbard, *Northern Virginia Community College, Alexandria*; Sierra Iwanicki, *Eastern Michigan University*; Alisha Janowsky, *University of Central Florida*; Joan Jensen, *Central Piedmont Community College*; Robert Rex Johnson, *Delaware County Community College*; Karen Jolley, *Central Georgia Technical College*; Deana Julka, *University of Portland*; Kristina Klassen, *North Idaho College*; Julie Learn, *Indiana University of Pennsylvania*; James Leone, *Bridgewater State University*; Bernard Levin, *Blue Ridge Community College*; Carolyn Lorente, *Northern Virginia Community College*; Alex Marvin, *Seminole State College of Florida*; Daniel McConnell, *University of Central Florida*; Mark McKellop, *Juniata College*; Ticily Medley, *Tarrant County Community College, South Campus*; Amy Meeks, *Texas State University*; Elisabeth Morray, *Boston College*; Gabe Mydland, *Dakota State University*; Ronn Newby, *Des Moines Area Community College*; Mason Niblack, *Salish-Kootenai College*; Caroline Olko, *Nassau Community College*; Mary-Ellen O'Sullivan-Vollemans, *Housatonic Community College*

and *Southern Connecticut University*; Alison Pepper, *University of Montana, Missoula College*; Doug Peterson, *University of South Dakota*; Susan Poulin, *Central Main Medical Center College of Nursing and Health Professions*; Chris K. Randall, *Kennesaw State University*; Matthew Rhoads, *Arkansas State University*; Nicole Rodiles, *Imperial Valley College*; Theresa Rufrano-Ruffner, *Indiana University of Pennsylvania*; Sharon Sanders, *University of Cincinnati, Clermont College*; Hildur Schilling, *Fitchburg State University*; Sharon Sexton, *Texas States Technical College*; David Shepard, *South Texas College*; Jessica Siegel, *University of the South*; Stuart Silverberg, *Westmoreland County Community College*; Amy Skinner, *Central Alabama Community College*; Nelly Sta Maria, *Suffolk County Community College*; Cari Stevenson, *Kankakee Community College*; John Story, *Bluegrass Community and Technical College*; Eva Szeli, *Arizona State University*; Rachelle Tannenbaum, *Anne Arundel Community College*; Kim Taylor, *Spokane Falls Community College*; Jane Theriault, *University of Massachusetts, Lowell*; Sherri Toman, *United Tribes Technical College*; Katie Townsend-Merino, *Palomar College*; Victoria Van Wie, *Lone Star College, CyFair*; Catherine Wehlburg, *Texas Christian University*; John Wright, *Washington State University*; Jason Young, *Hunter College*.

Special Thanks

- We'd like to offer our very special thank you to the superb editorial and production teams at John Wiley & Sons. Like any cooperative effort, writing a book requires an immense support team, and we are deeply grateful to this remarkable group of people: Mary Ann Price, Senior Photo Editor; Maureen Eide, Senior Designer; Beth Tripmacher, Product Designer; Kristen Mucci, Editorial Assistant; and a host of others. Each of these individuals helped enormously in the production of this text. Without them, this book and its wide assortment of ancillaries would not have been possible.

- Our deepest gratitude also goes out to Chris Johnson, Executive Editor. We're continually impressed by, and eternally grateful for, his invaluable feedback, suggestions, and thoughtful guidance from beginning to end. His enthusiasm and steadfast support also kept our spirits up when time was short and demands were high. Best of all, he's a fun guy and delightful work partner!

- We're deeply indebted to Margaret Barrett, Senior Marketing Manager, who handles all the ins and outs of marketing. Her creativity, insights, and unflagging energy are an inspiration to all who know her.

- *Psychology in Action* also could not exist without a great ancillary author team. We gratefully acknowledge

the expertise and immense talents of our Instructor Demonstration Videos director, Melissa Patton of Eastern Florida State College; Test Bank author, Stuart Silverberg of Westmoreland County Community College; Instructor's Resource Guide author, Ronn Newby of Des Moines Area Community College; PowerPoint authors, Nicholas Greco of Columbia College of Missouri, Lake County Campus, and Katie Townsend-Merino of Palomar College; and Practice Test author, Kate Halverson of Des Moines Area Community College.

- The staff at Furino Production deserves a special note of thanks – especially, Jeanine Furino. Their careful and professional approach was critical to the successful production of this book. Jeanine supervised this book from manuscript through bound book, with great patience and incredible grace.

- We'd also like to express our heartfelt appreciation to the hundreds of faculty across the country who contributed their constructive ideas to *Psychology in Action, 11e,* and to our many students over all the years. They've taught us what students want to know, and inspired us to write this book.

- Finally, all the hard work of the entire staff, and months of writing, producing, and marketing of this book, would be wasted without an energetic and dedicated sales staff. We wish to sincerely thank all the publishing representatives for their tireless efforts and good humor. It's a true pleasure to work with such a remarkable group of people.

Personal Acknowledgments

_____.

- From Katherine Dowdell: Many thanks to my friend, mentor, and co-author, Karen Huffman, for being my personal guide on this incredible journey. I'd also like to express my deep appreciation to my children, Jane and Vaughn Hommerding, for sharing their unique perspectives and feedback on the manuscript, and to my friends and colleagues, for their input, insight, and advice. And finally, my love and gratitude to my husband, Mark Hommerding, for his unfailing support, love, and encouragement – not to mention the late night runs to the copy center!

- From Karen Huffman: I welcome Katherine Dowdell to the shared authorship of the eleventh edition, and sincerely thank her for her companionship and invaluable contributions. It's been a great and interesting journey!

In truth, the writing of this (and all editions of Psychology in Action) has been a group effort involving the input and support of my wonderful friends, family, and valued colleagues. To each person, I offer my most sincere thanks: Amy Beeman, Joline Bourdages, Sky Chafin, Haydn Davis, Mike Garza, Teresa Jacob, Jim Matiya, Lou Milstein, Kandis Mutter, Tyler Mutter, Roger Morrissette, Katie Townsend-Merino, Maria Pok, Fred Rose, Jamie West, Kathy Young. They provided personal friendship, feedback, careful editing, library research, and a unique sense of what should and should not go into an introduction to psychology text.

A special note of appreciation goes to my dear friend and colleague, Tom Frangicetto at Northampton Community College. His co-authoring of the critical thinking Prologue, and full authorship of most of the critical thinking exercises for each chapter, provided invaluable, "hands on" opportunities for our students to practice and develop their critical thinking skills.

Finally, I send a big hug and continuing appreciation to Richard Hosey and Rita Jeffries. Their careful editing, constructive feedback, professional research skills, and shared authorship were essential to this revision. Last, and definitely not least, I thank my beloved husband, Bill Barnard. My professional life and personal happiness are in your hands.

Prologue

Successful Living Through Critical Thinking

Co-authored with Thomas Frangicetto (and generous contributions from his students at Northampton Community College, Bethlehem, PA)

"Sherlock Holmes is not a cold, calculating, self-gratifying machine. He cares for Watson...and for Mrs. Hudson. He has a conscience... In other words, Holmes has emotions-and attachments-like the rest of us. What he's better at is controlling them and only letting them show under very specific circumstances."

MARIA KONNIKOVA (2012), "STOP CALLING SHERLOCK HOLMES A SOCIOPATH!"

Benedict Cumberbatch as Sherlock

Psychologist Maria Konnikova also could have said that Sherlock Holmes – the famous fictional detective created by Sir Arthur Conan Doyle and popularized in numerous movies, books, and TV shows – is an excellent *critical thinker*. In applying fundamental, psychological principles of deduction, perception, skepticism, and logic, Holmes realized that emotions could be the enemy of sound reasoning (Kellogg, 1986). Even the most sublime emotion of all, *love*, is not to be trusted. In one story, Holmes says to his best friend and crime-solving companion, Dr. John Watson, "Love is an emotional thing, and whatever is emotional is opposed to that cold reason which I place above all things."

Why are we opening this Prologue on Critical Thinking with a discussion of emotions? We believe, as Sherlock Holmes did, that our capacity for objective reason is compromised when we are highly emotional (Halpern, 2014; Paul & Elder, 2002). What about Sherlock Holmes' love life? Although he "cared deeply" about special people in his life, he apparently never experienced *romantic love*. Had Holmes been a real person working with Dr. John Gottman (a preeminent authority on love and romantic relationships—see Chapter 16), and had he applied his critical thinking skills to his love life, he may have been more successful. Effective critical thinking is the best route to finding lasting love, as well as the best antidote to self-defeating, repetitive thoughts, feelings and actions. Unlike the common use of "critical" as a negative type of criticism and fault finding, critical thinking is a positive, life-enhancing process and key to success in all parts of our lives.

What exactly is critical thinking? We define it as: *Thinking about our feelings, actions, and thoughts so we can clarify and improve them* (adapted from Chaffee, 1988, p. 29). As you can see in **Figure 1**, there are 3 main categories of critical thinking, with at least 15 overlapping **critical thinking components (CTCs):** Affective (feelings/emotions), Behavioral (actions), and Cognitive (thoughts).
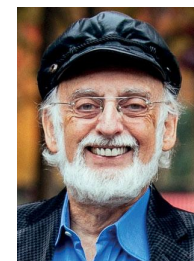
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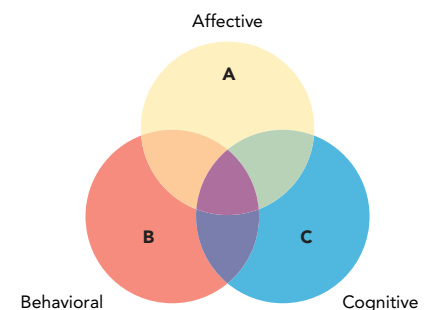
Figure 1 **ABCs of Critical Thinking**

15 Critical Thinking Components (CTCs)

(Note: Most CTCs include personal examples generously provided by students at Northampton Community College.)

Affective Components (Emotional foundation for critical thinking)

1. **Empathize and Demonstrate Altruism:** Critical thinkers are empathic. They try to understand others' feelings, thoughts, and behaviors. Noncritical thinkers view everything in relation to themselves, which is known as "egocentrism" (Chapter 13). The ability to consider the perspective of another person is the most effective antidote to egocentric thinking. *There are children who lag behind in language development. It's best to* empathize. *When I am a teacher, there are going to be many times where I need to know that differences are "okay."*

    KAYLA ANN FELTEN

    Can you see how empathy would naturally lead to altruism—*actions designed to help others with no obvious benefit to the helper* (Chapter 16)? Once we stand in another's shoes and mirror their emotions, we naturally want to help them.

2. **Welcome Divergent Views and Critical Dialogue:** Critical thinkers examine issues from every angle, especially opposing viewpoints. This quality is especially valuable in decision-making and avoiding groupthink (Chapter 16). *Most Americans don't try to understand the sociocultural influences of suicide bombers. They believe that martyrs are crazy, while Palestinians believe that martyrdom is to be idolized. My decision to believe that martyrdom is a form of self-expression may clash with the views of many, but as an American, I have the right to believe what I want.*

    SOPHIA BLANCHET

    Critical thinkers also actively question others, challenge opinions, and welcome questions and challenges in return. Socratic questioning is an important type of critical dialogue, which deeply probes the meaning, justification, or logical strength of an argument (Elder & Paul, 2007). It is easy to avoid such time-consuming dialogues, but they are a vital part of intellectually healthy relationships. *My mother has been calling me for the last year because she is dying. It has taken a long time to warm up to her because of the past. After many years, we are finally expressing our feelings with each other. This has been gratifying because we have become friends. My hope is that when the end comes, we will know that, despite our faults, we really loved each other.*

    TIM WALKER

3. **Tolerate Ambiguity, but not Magical Thinking:** Formal education often trains us to look for a single "right" answer (aka *convergent thinking*—Chapter 8). But critical thinkers know that many issues are too complex to have one right answer. They value qualifiers such as "probably" and "not very likely." *A big difference between high school and college level thinking is* tolerating ambiguity. *In high school, we were often taught there was one right answer. In college, we learn that things are more complex. We also learn that some questions do not even have an "answer" or may have multiple answers.*

    CHEREEN NAWROCKI

    Tolerating ambiguity does not mean that all beliefs and opinions are equally valid. Despite scientific consensus on many issues, noncritical thinkers often resort to *magical thinking*, which makes unwarranted links between one event—some action we've taken—and some unconnected result (Riggio, 2014). Consider superstitious behaviors, the belief in supernatural forces—such as ghosts, alien abductions, possession by spiritual entities—or even winning big one time at gambling and expecting to win repeatedly (Sagan, 1996; Shermer & Gould, 2007). *The problem with* magical thinking *is that we can believe that our actions are caused by the magical force instead of being due to us or the social environment. Reliance on magical thinking to explain things leads to self-deception and a lack of insight.*

    RONALD RIGGIO

4. **Appreciate Eclecticism and Synthesize:** Critical thinkers are not bound to one way of thinking. They appreciate and select what appears to be the best or most useful option when faced with competing ideas and approaches. For example, a psychotherapist might have training in one theoretical perspective, but also use techniques from other perspectives when more appropriate for the problems presented. This CTC goes beyond *welcoming divergent views*; it also involves analyzing all potential sources for value and content.

    Critical thinkers are also able to combine or "synthesize" various elements into a useful composite. *Understanding a suicidal person is the key to saving them. Critical thinkers "recognize that comprehension comes from combining various elements into a useful composite." By seeing patterns or "warning signs"—such as different symptoms of depression and changes in behavior—you can recognize suicidal thinking.*

    MICELLE PASCOE

5. **Value Emotional Intelligence (EI):** Defined as "the ability to know and manage one's emotions, empathize with others, and maintain satisfying relationships," emotional intelligence (Chapter 12) can serve as the bridge between our intelligence and emotional reactions. *I think increasing children's* emotional intelligence *is a superb idea—especially a focus on managing aggressive impulses. The ability to manage aggressiveness means you are well on your way toward learning to control your feelings and recognizing the feelings of others too.*

    AMY HARDING

Behavioral Components (Actions necessary for critical thinking)

6. **Listen Actively and Cultivate Trust:** Critical thinkers fully engage their thoughts, feelings, and actions when listening to another person. They ask questions, nonverbally affirm what they hear, and request clarification. *My brother was diagnosed with a rare kidney disease, and I tried my hardest to communicate with him and appreciate his thoughts and feelings. When he would try to talk about his feelings, I would often interrupt or tell him what he should think or feel. I was trying to focus on my need to control my own feelings when I should have been doing what he needed the most from me:* active listening.

    TONI SNEAD

In addition to active listening, being both trusting and trustworthy are essential qualities to bring to all meaningful relationships. One caution: Not everyone is worthy of your total trust. It is a privilege that must be earned over time and trial. For Gottman, trust is not something that just "grows" between people; rather, it is the "specific state that exists when you are both willing to change your own behavior to benefit your partner"—in other words, "you have each other's back" (Gottman, 2012).

7. **Employ Precise Terms and Define Problems Accurately:** Precise terms help critical thinkers identify issues clearly so they can be objectively defined and empirically tested. When two people argue about an issue, they are often defining it differently without even knowing it. *I have had a Japanese girlfriend for the last year and a half. Our cultures are very different and at times we do not understand each other. But, if we remain open and help each other appreciate what words like "love" and "commitment" mean to us, we can learn how to understand each other better.*

<div align="right">ANAR AKHUNDOV</div>

A critical thinker also tries to frame the issues as accurately as possible to prevent confusion and to lay the foundation for gathering relevant information (see CTC #8). This CTC appears to contradict *tolerating ambiguity* (see CTC #3), but critical thinkers are able to tolerate ambiguity until it is possible to *define problems accurately*.

8. **Gather Information and Delay Judgment until Adequate Data are Available**: Impulsivity is a major obstacle to good critical thinking. Rash judgments about others, impulse purchases of a new car or home, uninformed choices for political candidates, or "falling in love at first sight" can all be costly mistakes that we may regret for many years. A critical thinker does not make snap judgments. Instead, he or she collects up-to-date, relevant information on all sides of an issue and delays decisions or judgment until adequate information is available. *I am a white male. I have met African Americans I don't like, I have met Asians I don't like, I have met Hispanics I don't like, and yes, I have met whites I don't like. So if I don't like an entire race of people because I don't like certain people of that race, then I shouldn't like my own race either, because there are people of my race I don't like. You cannot judge a race by its worst representatives. I know I would not want my whole race judged by "White Power," KKK members. Maybe someday we will just have one race—the human race.*

<div align="right">RYAN UMHOLTZ</div>

9. **Cultivate Open-Mindedness and Modify Judgments in Light of New Information:** Critical thinkers are willing to examine their own thinking and abandon or *modify their judgments* if compelling evidence contradicts them. Noncritical thinkers stubbornly stick to their beliefs and often *value self-interest above the truth*. The ability to say, "I'm rethinking my opinion," reflects the open-minded flexibility of a good critical thinker. *For much of high school, I procrastinated. However, I procrastinate less now that I am in college. I know now that these assignments are for my benefit and that a certain level of self-motivation is required*

in order to succeed in life. I am paying for my education, so I may as well get as much out of it as I can.

<div align="right">TOM SHIMER</div>

10. **Accept Change:** Critical thinkers remain open to the need for adjustment throughout our life cycle. Because critical thinkers fully trust the processes of reasoned inquiry, they are willing to use these skills to examine even their most deeply held beliefs, and to modify these beliefs when evidence and experience contradict them. *It's easy to tell a woman to get out of a bad relationship because she doesn't deserve to be abused. It's much harder when you're the one in the relationship. It's important for the abused woman to stop trying to "change" the man, thinking the situation will get better. It's vital not to be stuck in a toxic situation and accepting change is the first step.*

<div align="right">KATRINA KELLY</div>

Cognitive Components (Thought processes required for critical thinking)

11. **Recognize Personal Biases and Value Truth above Self-Interest:** Being an effective critical thinker does not mean the absence of bias, but rather the willingness to recognize and correct it. *We may think we are hitting the benchmarks on social issues when we drop a "bill or two in the bucket" and consider our job done. Some of us view the suffering of others as the result of their own actions. Over-generalizing that all "purple people" are lazy and all "orange people" are uncivilized reflects bias... [where] there is no room for empathy or simple kindness. Unless we recognize our personal biases, instead of hiding behind them as a cover for a lack of humanness, we will never witness another's oppression and "feel their pain."*

<div align="right">MARY ELLEN ALLEN</div>

Critical thinkers also avoid the tendency to cater to our self-interests, while ignoring conflicting information. We must recognize that, even when it appears otherwise, the "truth" is always in our self-interest. *No matter what my interest was in watching my friends do drugs, I valued the truth against their reasons for why I should begin to smoke with them. Anytime I felt tempted, I valued what my mother told me. The truth was in front of my eyes. Family members that were homeless, indulging in illegal drugs, were the truth for me. I valued my life more than I wanted to fit in.*

<div align="right">NICOLE BOUVET</div>

12. **Recognize Fact versus Opinion and Resist Over-generalization:** *Facts* are statements that are supported by objective evidence. *Opinions* are statements that express how a person feels about an issue or what someone *believes* to be true. It is easy to have an uninformed opinion about any subject, but critical thinkers seek out and evaluate facts before forming their opinions.

Overgeneralization is applying an experience to other situations that are only superficially similar. It's also a form of "tunnel vision"—failing to see the bigger picture because you see just a small sample of the whole. *While watching a rerun of*

"Jersey Shore," I made an over-generalization about "Jersey guys"! The show convinced me that every Jersey boy in his twenties was a meathead without moral values and who only cared about his looks. I met a Jersey boy and automatically thought he was like one of the guys from the show. Turns out he was an educated man who happened to come from New Jersey.

CAITIE STONEBACK

13. **Analyze Data for Value and Content and Apply Knowledge to New Situations:** By evaluating the nature of evidence and the credibility of sources, critical thinkers recognize blatant appeals to emotion, unsupported claims, and faulty logic. They also can spot sources that contradict themselves, or have a vested interest in selling a product, idea, or viewpoint that is only partially accurate (a "half-truth"). *This is an important CTC when it comes to choosing a religion because it takes a full analysis of a religious system in order to make the right choice. If I break down all of a religion's content for its inherent value, I will be making a well-informed decision.*

ALI NABAVIAN

Noncritical thinkers can often provide correct answers, repeat definitions, and carry out calculations, yet they are unable to transfer their knowledge to new situations because of an inability to "synthesize" seemingly unrelated content (see #4). *History teaches that war rarely puts an end to a conflict. America's experience in Iraq argues that military action against Iran means inviting more trouble. Iran would retaliate, inviting a tit-for-tat escalation, putting American interests in great danger. Polls tell us most Americans prefer diplomatic options.*

NIVEDITA "MINU" MAHATO

14. **Independent Thinking:** Rather than passively accepting the beliefs of others or being easily manipulated, critical thinkers are independent. They hold firm to their own values, while recognizing the difference between being independent and just being stubborn (Sagan, 1996; Shermer & Gould, 2007). *All my life, I was a follower. I did what everyone else did—the designer clothes, the make up, the highlights, etc. Instead of thinking independently, I went with the crowd. And that was one of my greatest downfalls.*

COURTNEY FISHER

15. **Metacognition** (aka *reflective thinking)* involves analyzing your mental processes—*thinking about your own thinking*. Critical thinkers who are motivated to examine and trace the origin of their beliefs can often be heard saying things like: "What was I thinking?" or "I don't know why I believe that, I'll have to think about it." *My dad and I had a torn relationship following my parents' divorce. I couldn't live with my mother anymore, so I thought about living with my dad. I began employing meta-cognition. I wanted to understand my anger toward him. I realized when we fought, it was just frustration. I decided to move in with my dad, and I'm happy to say our relationship has changed dramatically for the better. Using critical thinking made a huge difference.*

LAURA MARKLEY

NEW and CONTINUING Special Features, PSYCHOLOGY IN ACTION, 11e

Chapter Title	Research Challenge	Media Challenge
1. Introduction and Research Methods	Politics and Dating Relationships (p. 31)	Is College Worth It? (pp. 39–40)
2. Neuroscience and Biological Foundations	Phineas Gage—Myths Versus Facts (p. 72)	The (Invisible) Plague of Concussion (pp. 78–79)
3. Stress and Health Psychology	Stressing About Stress? (p. 99)	Are We Denying the Dangers of Stress? (pp. 110–111)
4. Sensation and Perception	Hope for Alzheimer's Disease? (p. 126)	Astrology and Crime (p. 144)
5. States of Consciousness	Why Driving and Cell Phone Use Just Don't Mix (152)	Teen Night Owls (pp. 176–177)
6. Learning	Cognitive-Social Learning and Human Sexuality (p. 207)	The Return of the Working Class Hero (pp. 211–212)
7. Memory	Do We "Remember" What We Want to Remember? (p. 238)	How Memorists Mold the Truth (pp. 243–244)
8. Thinking, Language, and Intelligence	IQ Versus Lifetime Success (p. 273)	How Social Media is Ruining Our Minds (pp. 275–276)
9. Life Span Development I	Attachment, Deprivation, and Development (p. 305)	Older and Slower? (pp. 310–311)
10. Life Span Development II	Embodied Morality: Clean Hands, Pure Heart (p. 319)	Millennials: Not the Marrying Kind? (pp. 338–339)
11. Gender and Human Sexuality	First Sexual Experiences (p. 354)	Scarcity of Women in Science? (p. 374)
12. Motivation and Emotion	Eating Problems and Early Learning (p. 391)	Mirror, Mirror on the Wall? (p. 404)
13. Personality	Do Animals Have Unique Personalities? (p. 420)	Can Personality Predict Health? (p. 436)
14. Psychological Disorders	Creativity and Mental Disorders (p. 448)	Lefties and Psychotic Disorders (pp. 469–470)
15. Therapy	Can Writing Save Your Marriage? (p. 494)	Finding Treatment Grows Harder (p. 500)
16. Social Psychology	Love and the Internet (p. 532)	When Science Becomes News (pp. 534–535)

1

Introduction and Research Methods

Welcome to the exciting world of *Psychology in Action*. As the cover of this text and its name imply, psychology is a *living*, dynamic field that affects every part of our lives—our relationships at home, college, and work, as well as politics, television, movies, newspapers, radio, and the Internet.

When we took our first general psychology courses, we didn't realize or fully appreciate its invaluable personal applications and incredible range of topics. Like you, perhaps, we assumed all psychologists were therapists and were expecting to study mostly abnormal behavior.

Today, as two college psychology professors, we find that most of our students share many of these same expectations—and misconceptions. Psychologists certainly do study and treat abnormal behavior. But we also study sleep, dreaming, stress, health, drugs, personality, sexuality, motivation, emotion, learning, memory, childhood, aging, death, love, conformity, intelligence, creativity, and so much more.

Our goal as your textbook authors is to serve as your personal "tour guides" to all these fascinating topics. We will guide you on a fast-paced journey through all the major fields of psychology, along with exciting forays into little-known or previously uncharted territories filled with intriguing insights into yourself and the world around you. Be sure to pack your bags with an ample supply of curiosity, enthusiasm, and an open-minded spirit of adventure. That's all the supplies you'll need for what promises to be the most exciting and unforgettable trip of your academic lifetime!

As you're reading through this text and participating in this psychological journey, we invite you to let us know how your study of psychology (and this text) affects you and your life. You can reach us at khuffman@palomar.edu and kdowdell@dmacc.edu. We look forward to hearing from you. Warmest regards,

Courtesy of Karen Huffman

Courtesy of Katherine Dowdell

Karen R. Huffman

Katherine Dowdell

CHAPTER OUTLINE

LEARNING OBJECTIVES

Introducing Psychology

Psychology—Past and Present

Careers in Psychology

SUMMARIZE psychology, its past and present, and its current career options.

- **DEFINE** psychology, critical thinking, and pseudopsychologies.
- **REVIEW** structuralism, functionalism, and modern psychology's seven major perspectives.
- **DISCUSS** the contributions of women and minorities to psychology.
- **DESCRIBE** the biopsychosocial model, along with individualistic and collectivistic cultures.
- **SUMMARIZE** psychology's major career options.

The Science of Psychology

The Scientific Method

Psychology's Four Main Goals

DISCUSS the key principles underlying the science of psychology.

- **COMPARE** the fundamental goals of basic and applied research.
- **DESCRIBE** the scientific method, its key terms, and its six steps.
- **REVIEW** psychology's four main goals.

Research Methods

Descriptive Research

Correlational Research

Experimental Research

Research Challenge: Politics and Dating Relationships

Ethical Guidelines

SUMMARIZE psychology's three major research methods.

- **REVIEW** descriptive research and its four key methods.
- **DISCUSS** correlational research and the correlation coefficient.
- **IDENTIFY** the key terms and components of experimental research.
- **DESCRIBE** the ethical concerns and guidelines for psychological research.

Tools for Student Success

Study Habits

Time Management

Grade Improvement

Attitude Adjustment

REVIEW the key strategies for student success.

- **DESCRIBE** the steps you can take to improve your study habits.
- **DISCUSS** ways to improve your time management.
- **DISCUSS** the key factors in grade improvement.
- **EXPLAIN** why attitude adjustment is important to student success.

Psychology Enrichment Activities

Media Challenge: Is College Worth It?

Critical Thinking Exercise

Looking Back/Looking Ahead

Chapter Review:
    Application Quiz

Key Terms

CHAPTER OVERVIEW

What do you think about psychology? What are you hoping to learn in this course and text? One of the many things we enjoy about teaching general psychology, AND writing this text, is helping students overcome their initial misconceptions about our field. We also love sharing all the invaluable insights and discoveries of psychological science, which have the power to literally change your life!

Given that this first chapter is an overview of the entire field of psychology and this text, we must begin with a formal definition of psychology, followed by a brief history of the beginnings of psychology as a scientific discipline. Next, we'll see how modern psychology has developed into seven major perspectives, as well as many different specialties and careers. Then we explore the scientific method and how psychologists apply this method when conducting research. We close with a brief overview of the top "Tools for Student Success." These techniques will help you master the material in this (and all) textbooks, and will increase your performance on exams in this (and all) classes. Be sure to carefully study this section. We care about you and want you to succeed!

WHY STUDY PSYCHOLOGY

The study of psychology will:

- **Increase your understanding of yourself and others.** The Greek philosopher Socrates admonished long ago, "Know thyself." Studying psychology will greatly contribute to your understanding (and appreciation) of yourself and others.

- **Better your social relations and enhance your career.** Thanks to years of scientific research and application, psychology has developed numerous guidelines and techniques that will improve your relationships with friends, family, and coworkers, while also improving your professional life.

- **Broaden your general education.** Psychology is an integral part of today's political, social, and economic world. Understanding its principles and concepts is essential to becoming an educated, well-informed person.

- **Improve your critical thinking.** Would you like to become a more independent thinker, a better decision maker, and a more effective problem solver? These are only a few of the many critical thinking skills that are enhanced through a study of psychology.

Paul Bradbury/OJO Images/Getty Images

STUDY TIP

Learning Objectives

Each section of every chapter contains learning objectives, which you should attempt to answer in your own words as you read that section. Summarizing your answers to these objectives will keep you focused, and greatly improve your mastery of the material.

Psychology The scientific study of behavior and mental processes.

Introducing Psychology

LEARNING OBJECTIVES While reading the upcoming sections, respond to each Learning Objective in your own words. Then compare your responses to those found at www.wiley.com/college/huffman.

SUMMARIZE psychology, its past and present, and its current career options.
- **DEFINE** psychology, critical thinking, and pseudopsychologies.
- **REVIEW** structuralism, functionalism, and modern psychology's seven major perspectives.
- **DISCUSS** the contributions of women and minorities to psychology.
- **DESCRIBE** the biopsychosocial model, along with individualistic and collectivistic cultures.
- **SUMMARIZE** psychology's major career options.

The term **psychology** derives from the roots *psyche*, meaning "mind," and *logos*, meaning "word." Modern psychology is most commonly defined as the *scientific study of behavior and mental processes. Scientific* is a key feature of the definition because psychologists

follow strict scientific procedures to collect and analyze their data. *Behavior* (such as crying, hitting, and sleeping) can be directly observed. *Mental processes* are private, internal experiences that cannot be directly observed (like feelings, thoughts, and memories).

For many psychologists, the most important part of the definition of psychology is the word *scientific*. Psychology places high value on *empirical evidence* that can be objectively tested and evaluated. Psychologists also emphasize **critical thinking**, *the process of objectively evaluating, comparing, analyzing, and synthesizing information* (Halpern, 2014; Schick & Vaughn, 2014).

Be careful not to confuse psychology with *pseudopsychologies*, which are based on common beliefs, folk wisdom, or superstitions. (*Pseudo* means "false.") These sometimes give the appearance of science, but they do not follow the basics of the scientific method. Examples include purported psychic powers, horoscopes, mediums, and self-help and "pop psych" statements such as "I'm mostly right-brained" or "We use only 10% of our brain." Given the popularity of these misleading beliefs, be sure to test your own possible misperceptions in the following "Myth Busters" section. We offer these unique opportunities throughout this text. Be sure to test yourself each time they appear. Doing so will increase your overall understanding of psychology and also improve your critical thinking skills by helping you sort the scientific facts from the many myths and pseudopsychologies.

How did you do on the Myth Busters quiz? Our students often miss several questions because they rely on common sense, personal experience, or media reports of "pop psychology." Mistakes also are made when they confuse scientific psychology with *pseudopsychologies*, which include:

- *Psychics* supposedly sensitive to supernatural forces. *Mediums* claiming to be channels of communication between the earthly and spiritual worlds.

Critical Thinking The process of objectively evaluating, comparing, analyzing, and synthesizing information.

(c) Christine Glade/iStockphoto

Test Your Critical Thinking

1. Have you heard that dog owners are healthier and happier than non-dog owners? Can you think of an alternative explanation, other than their pets, for why dog owners might be healthier?

2. People often confuse critical thinking with simply being critical and argumentative. How would you explain the true meaning and value of critical thinking?

MYTH BUSTERS

Test Yourself

True or False?

_____ 1. Your first hunch on a multiple-choice test is your best guess (Chapter 1).

_____ 2. Most of us use only 10% of our brains (Chapter 2).

_____ 3. Advertisers and politicians often use subliminal persuasion to influence our behavior (Chapter 4).

_____ 4. Most brain activity stops during sleep (Chapter 5).

_____ 5. Eye witness testimony is highly reliable (Chapter 7).

_____ 6. Most middle-aged people experience a midlife crisis (Chapter 10).

_____ 7. Polygraph ("lie detector") tests can accurately and reliably reveal whether or not a person is lying (Chapter 12).

_____ 8. People who threaten suicide seldom follow through with it (Chapter 14).

_____ 9. People with schizophrenia have multiple personalities (Chapter 14).

_____ 10. Modern electroconvulsive ("shock") therapy is a physically dangerous and ineffective therapy (Chapter 15).

_____ 11. Similarity is one of the best predictors of satisfaction in long-term relationships (Chapter 16).

_____ 12. In an emergency, as the number of bystanders increases, your chance of getting help decreases (Chapter 16).

Answers: 1–10 are false, 11 and 12 are true. (Details provided in designated chapters.)
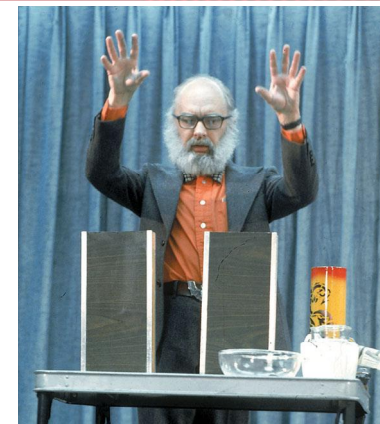
Henry Groskinsky/Time Life Pictures/Getty Images

The magician James Randi has dedicated his life to educating the public about fraudulent pseudopsychologists. Along with the prestigious MacArthur Foundation, Randi has offered $1 million to "anyone who proves a genuine psychic power under proper observing conditions" (Randi, 2014; The Amazing Meeting, 2011). Even after many years, the money has never been collected.

- *Palmists* reportedly able to predict a person's future or character from the lines on the palms.

- *Astrologers* claiming the positions of the stars and planets influence our personalities and future events.

For some, horoscopes or palmists are simple entertainment. Unfortunately, some true believers seek guidance and waste large sums of money on charlatans purporting to know the future. Broken-hearted families also have lost valuable time and emotional energy on psychics claiming they could locate their missing children. As you can see, distinguishing scientific psychology from pseudopsychology is vitally important (Lilienfeld et al., 2010; Loftus, 2010; Smith, 2010).

Psychology—Past and Present

Humans have always been interested in human nature. Most of the great historical scholars, from Socrates and Aristotle to Bacon and Descartes, asked questions that we would today call psychological. What motivates people? How do we think and problem solve? Where do our emotions and reason reside? Do our emotions control us, or are they something we can control? Interest in such topics remained largely among philosophers, theologians, and writers for several thousand years. However, in the late nineteenth century, psychology began to emerge as a separate scientific discipline.

Throughout its short history, psychologists have adopted several perspectives on the "appropriate" topics for psychological research and the "proper" research methods. As a student, you may find these multiple (and sometimes contradictory) approaches frustrating and confusing. However, diversity and debate have always been the life blood of science and scientific progress.

Psychology's Past

In this very brief overview of the history of psychology, we'll begin in 1879, which is generally considered to be when the science of psychology was born (Benjamin, 2014). Why is this date so important? During this year, Wilhelm Wundt (1832–1920), a German philosopher-physician, conducted the first experiments and measurements of the workings of the human brain. These experiments led to the academic discipline of psychology, and the birth of psychological science.

During these experiments, Wundt and his colleagues focused on how we form sensations, images, and feelings using a method called *introspection*, which means "looking inward." If you had been one of Wundt's laboratory participants trained in introspection, you might have been presented with the sound of a clicking metronome and told to focus solely on the clicks. Then, while listening to the clicks, you would have been asked to think about and report all your conscious thoughts, sensations, and feelings.

TRY THIS YOURSELF

Why Do We Need Multiple and Competing Perspectives?

What do you see in the drawing to the right? Do you see two profiles facing each other or a white vase? Your ability to see both figures is similar to a psychologist's ability to study behavior and mental processes from a number of different perspectives.

Courtesy Kasier Porcelain, Ltd

How is this type of introspection scientific? The experiments were conducted in a laboratory setting using many of the standardized controls we'll describe later on in this chapter.

A student of Wundt's, Edward Titchener, brought his ideas to the United States. Titchener's approach, now known as *structuralism*, sought to identify the basic building blocks, or "structures," of mental life through introspection and then to determine how these elements combine to form the whole of experience. Because introspection could not be used to study animals, children, or more complex mental disorders, however, structuralism failed as a working psychological approach. Although short-lived, it did establish a model for studying mental processes scientifically.

Structuralism's intellectual successor, *functionalism*, studied the way the mind functions to enable humans and other animals to adapt to their environment. William James was the leading force in the functionalist school (**Figure 1.1**). Although functionalism also eventually declined, it expanded the scope of psychology to include research on emotions and observable behaviors, initiated the psychological testing movement, and influenced modern education and industry.

During the late 1800s and early 1900s, while functionalism was prominent in the United States, the **psychoanalytic perspective** was forming in Europe. Its founder, Austrian physician Sigmund Freud, believed that a part of the human mind, the unconscious, contains thoughts, memories, and desires that lie outside personal awareness, yet still exert great influence. For example, according to Freud, a man who is cheating on his wife might slip up and say, "I wish you were her," when he consciously planned to say, "I wish you were here." Such seemingly meaningless, so-called "Freudian slips" supposedly reveal a person's true unconscious desires and motives.

Freud also believed many psychological problems are caused by unconscious sexual or aggressive motives and conflicts between "acceptable" and "unacceptable" behaviors (Chapter 13). His theory led to a system of therapy known as *psychoanalysis* (Chapter 15).

Modern Psychology

As summarized in **Table 1.1**, contemporary psychology reflects seven major perspectives: *psychodynamic*, *behavioral*, *humanistic*, *cognitive*, *biological*, *evolutionary*, and *sociocultural*. Although there are numerous differences among these seven perspectives, most psychologists recognize the value of each orientation and agree that no one view has all the answers.

Freud's nonscientific approach and emphasis on sexual and aggressive impulses have long been controversial, and today there are few strictly Freudian psychoanalysts left. However, the broad features of his theory remain in the modern **psychodynamic perspective**. The general goal of psychodynamic psychologists is to explore unconscious *dynamics*—internal motives, conflicts, and past experiences.

In the early 1900s, another major perspective appeared that dramatically shaped the course of modern psychology. Unlike earlier approaches, the **behavioral perspective** emphasizes objective, observable environmental influences on overt behavior. Behaviorism's founder, John B. Watson (1913), rejected the practice of introspection

Figure 1.1 **William James (1842–1910)** William James broadened psychology to include animal behavior and biological processes. In the late 1870s, James established the first psychology laboratory in the United States, at Harvard University.

Bettmann/Corbis Images
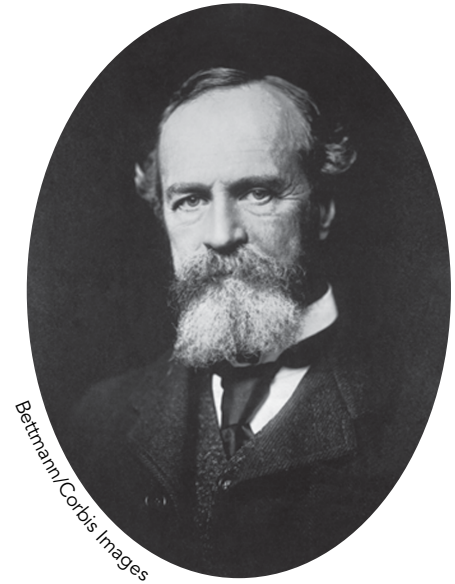
Psychoanalytic Perspective An approach to understanding behavior and mental processes developed by Freud, which focuses on unconscious processes and unresolved conflicts.

Psychodynamic Perspective An approach to understanding behavior and mental processes that emphasizes unconscious dynamics, internal motives, conflicts, and past experiences; actions are viewed as stemming from inherited instincts, biological drives, and attempts to resolve conflicts between personal needs and social requirements.

Behavioral Perspective An approach to understanding behavior and mental processes that emphasizes objective, observable environmental influences on overt behavior.

STUDY TIP

Key Terms and Running Glossary

Pay close attention to all key terms and concepts, which are boldfaced in the text, and then defined again in the margin. Key terms from all chapters also appear in a cumulative glossary at the end of this text.

TABLE 1.1 MODERN PSYCHOLOGY'S SEVEN MAJOR PERSPECTIVES

Perspectives	Major Emphases	Sample Research Questions	
Psychodynamic	Unconscious dynamics, motives, conflicts, and past experiences	How do adult personality traits or psychological problems reflect unconscious processes and early childhood experiences?	
Behavioral	Objective, observable, environmental influences on overt behavior; stimulus-response relationships and consequences for behavior	How do we learn both our good and bad habits? How can we increase desirable behaviors and decrease undesirable ones?	
Humanistic	Free will, self-actualization, and human nature as naturally positive and growth seeking	How can we promote a client's capacity for self-actualization and understanding of his or her own development? How can we promote international peace and reduce violence?	
Cognitive	Thinking, perceiving, problem solving, memory, language, and information processing	How do our thoughts and interpretations affect how we respond in certain situations? How can we improve how we process, store, and retrieve information?	
Biological	Genetic and biological processes in the brain and other parts of the nervous system	How might changes in neurotransmitters or damage to parts of the brain lead to psychological problems and changes in behavior and mental processes?	
Evolutionary	Natural selection, adaptation, and evolution of behavior and mental processes	How does natural selection help explain why we love and help certain people, but hurt others? Do we have specific genes for aggression and altruism?	
Sociocultural	Social interaction and the cultural determinants of behavior and mental processes	How do the values and beliefs transmitted from our social and cultural environments affect our everyday psychological processes?	

and the influence of unconscious forces. Instead, Watson adopted Russian physiologist Ivan Pavlov's concept of *conditioning* (Chapter 6) to explain behavior as a result of observable stimuli (in the environment) and observable responses (behavioral actions).

Most early behaviorist research was focused on learning; nonhuman animals were ideal subjects for this research. One of the best-known behaviorists, B. F. Skinner, was convinced that behaviorist approaches could be used to "shape" human behavior (**Figure 1.2**).

As you'll discover in Chapters 6 and 15, therapeutic techniques rooted in the behavioristic perspective have been most successful in treating observable behavioral problems, such as those related to phobias and alcoholism (Kiefer & Dinter, 2013; May et al., 2013; Sarafino, 2012).

Although the psychoanalytic and behavioral perspectives dominated U.S. psychology for some time, in the 1950s a new approach emerged—the **humanistic perspective**, which stresses *free will* (voluntarily chosen behavior) and *self-actualization* (an inborn drive to develop all one's talents and capabilities). According to Carl Rogers and Abraham Maslow, two key figures with this perspective, all individuals naturally strive to develop and move toward self-actualization. Like psychoanalysis, humanistic psychology developed an influential theory of personality, and its own form of psychotherapy (Chapters 13 and 15). The humanistic approach also led the way to a contemporary research specialty known as **positive psychology**—the study of optimal human functioning (**Figure 1.3**) (Cummins, 2013; Diener, 2008; Downey & Chang, 2014; Seligman, 2003, 2011; Taylor & Sherman, 2008).

One of the most influential modern approaches, the **cognitive perspective**, recalls psychology's earliest days in that it emphasizes thoughts, perception, and information processing (Galotti, 2014; Sternberg, 2012). Modern cognitive psychologists study the ways we gather, encode, and store information using a vast array of mental processes. These include perception, memory, imagery, concept formation, problem solving, reasoning, decision making, and language. Many cognitive psychologists also use an *information-processing approach*. They compare the mind to a computer that sequentially takes in information, processes it, and then produces a response.

During the past few decades, scientists have explored the role of biological factors in almost every area of psychology. Using sophisticated tools and technologies, scientists who adopt this **biological perspective** examine behavior through the lens of genetics and biological processes in the brain and other parts of the nervous system.

Figure 1.3 What makes us happy? Research in positive psychology finds that our happiness increases when we give to others. When adults are given money and told to spend it on others, they experience higher levels of happiness than do those who are told to spend it on themselves (Dunn et al., 2008). Amazingly enough, even children as young as 2 years of age are happier when they give treats such as Goldfish crackers to other children than when they keep the treats for themselves (Aknin et al., 2012). Other research finds that those who experience more positive emotions also live longer than those with more negative emotions (Diener & Chan, 2011).

Figure 1.2 B. F. Skinner (1904–1990) B. F. Skinner was one of the most influential psychologists of the twentieth century. Here he uses the so-called "Skinner box" to train a rat to press a lever for a reward.

Nina Leen/Time Life Pictures/Getty Images

Humanistic Perspective An approach to understanding behavior and mental processes that perceives human nature as naturally positive and growth seeking; it emphasizes free will and self-actualization.

Positive Psychology The study of optimal human functioning; it emphasizes positive emotions, traits, and institutions.

Cognitive Perspective An approach to understanding behavior and mental processes that focuses on thinking, perceiving, and information processing.

Biological Perspective An approach to understanding behavior and mental processes that focuses on genetics and biological processes in the brain and other parts of the nervous system.

veronicagomezpola/Shutterstock

Evolutionary Perspective An approach to understanding behavior and mental processes that stresses natural selection, adaptation, and evolution; it assumes that mental capabilities evolved over millions of years to serve particular adaptive purposes.

Sociocultural Perspective An approach to understanding behavior and mental processes that emphasizes the social interaction and cultural determinants of behavior and mental processes.

Biopsychosocial Model An integrative, unifying theme of modern psychology that sees biological, psychological, and social processes as interacting influences.

Figure 1.4 Kenneth Clark (1914–2005) and Mamie Phipps Clark (1917–1985) Kenneth Clark and his wife, Mamie Phipps Clark, conducted experiments with black and white dolls to study children's attitudes about race. This research and their expert testimony contributed to the U.S. Supreme Court's ruling that racial segregation in public schools was unconstitutional.

Library of Congress Prints and Photographs Division

For example, research shows that genes influence many aspects of our behavior, including whether we finish high school and college, how kind we are to other people, and even whom we vote for in elections (Beaver et al., 2011; Chang et al., 2014; Hatemi & McDermott, 2012; Poulin et al., 2012).

The **evolutionary perspective** stresses natural selection, adaptation, and evolution of behavior and mental processes (Buss, 2011; Durrant & Ellis, 2013; Workman & Reader, 2014). Its proponents argue that natural selection favors behaviors that enhance an organism's reproductive success. According to the evolutionary perspective, there's even an evolutionary explanation for the longevity of humans over other primates—it's grandmothers! Without them, a mother who has a two-year-old and then gives birth would have to devote her time and resources to the newborn at the expense of the older child. Grandmothers act as supplementary caregivers.

Finally, the **sociocultural perspective** emphasizes social interactions and cultural determinants of behavior and mental processes. Although we are often unaware of their influence, factors such as ethnicity, religion, occupation, and socioeconomic class, all have an enormous psychological impact on our mental processes and behavior (Berry et al., 2011; Cohen, 2014; Leong et al., 2014). For example, in countries with low levels of gender equality, women are more likely to be attracted by their partner's resources and men by physical attractiveness (Zentner & Mitura, 2012).

Gender and minority influences One of the first women to be recognized in the field of psychology was Mary Calkins. Her achievements are particularly noteworthy, considering the significant discrimination that she overcame. During the late 1800s and early 1900s, most colleges and universities provided little opportunity for women and ethnic minorities, either as students or as faculty members. In Mary Calkins' case, even after she completed all the requirements for a Ph.D. at Harvard University in 1895, and was described by William James as his brightest student, the university refused to grant the degree to a woman. Nevertheless, Calkins went on to perform valuable research on memory, and in 1905 served as the first female president of the American Psychological Association (APA). The first woman to receive her Ph.D. in psychology was Margaret Floy Washburn (Cornell, 1894), who wrote several influential books and served as the second female president of the APA.

Francis Cecil Sumner became the first African American to earn a Ph.D. in psychology (Clark University, 1920). Dr. Sumner later chaired one of the country's leading psychology departments, at Howard University. In 1971, one of Sumner's students, Kenneth B. Clark, became the first African American to be elected APA president. Clark's research with his wife, Mamie Clark, documented the harmful effects of prejudice and directly influenced the Supreme Court's landmark 1954 ruling against racial segregation in schools, Brown v. Board of Education (**Figure 1.4**).

Sumner, Clark, Calkins, and Washburn, along with other important minorities and women, made significant and lasting contributions to psychology's development. In recent times, people of color and women have been actively encouraged to pursue graduate degrees in psychology. Today, women earning doctoral degrees in psychology greatly outnumber men, but minorities are still underrepresented (American Psychological Association, 2014; Willyard, 2011).

Biopsychosocial model The seven major perspectives, as well as gender and minority influences, each make different contributions to modern psychology. This is why most contemporary psychologists do not adhere to one single intellectual perspective. Instead, a more integrative, unifying theme—the **biopsychosocial model**—has gained wide acceptance. This model views biological processes (genetics, neurotransmitters, evolution), psychological factors (learning, personality,

Figure 1.5 The biopsychosocial model When we consider people as individuals (**Figure a**), we don't always get a complete picture of their emotions and motivations. Stepping back to see the same individuals in a broader context (**Figure b**) can provide new insights. With this "bigger picture" (the child's immediate surroundings and his or her group's behavior) in mind, can you better understand why each child might be feeling and acting as he or she is? The biopsychosocial model recognizes that there is usually no single cause for our behavior or our mental states (**Figure c**). For example, our moods and feelings are often influenced by genetics and neurotransmitters (biological), our learned responses and patterns of thinking (psychological), and our socioeconomic status and cultural views of emotion (sociocultural).

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motivation), and social forces (family, culture, gender, and ethnicity) as interrelated. It also sees all three factors as influences inseparable from the seven major perspectives (**Figure 1.5**).

Why is the biopsychosocial model so important? As the old saying goes, "A fish doesn't know it's in water." Similarly, as individuals living alone inside our own heads, we're often unaware of the numerous, interacting factors that affect us—particularly cultural forces. For example, most North Americans and Western Europeans are raised to be very individualistic and are surprised to learn that over 70% of the world's population lives in collectivistic cultures. As you can see in **Table 1.2**, in *individualistic cultures*, the needs and goals of the individual are emphasized over the needs and goals of the group. When asked to complete the statement "I am . . .," people from individualistic cultures tend to respond with personality traits ("I am shy"; "I am outgoing") or their occupation ("I am a teacher"; "I am a student").

In *collectivistic cultures*, however, the person is defined and understood primarily by looking at his or her place in the social unit (Conway et al., 2014; Greenfield & Quiroz, 2013; McCrae, 2004, 2011). Relatedness, connectedness, and interdependence are valued, as opposed to separateness, independence, and individualism. When asked to complete the statement "I am . . .," people from collectivistic cultures tend to mention their families or nationality ("I am a daughter"; "I am Chinese"). Keep in mind, however, that these sample countries and their sample values exist

STUDY TIP

Throughout this text, you will see citations (authors' names and publication dates) at the end of many sentences, such as (Goodwin, 2012). Most instructors rarely expect you to memorize the names and dates in parentheses. They are provided as a starting point for research projects, for additional information on a topic of interest, and to double-check the research sources. Complete publication information (title of article or chapter, author, journal name or book title, date, and page numbers) is provided in the References section at the back of this book.

TABLE 1.2 A COMPARISON BETWEEN INDIVIDUALISTIC AND COLLECTIVISTIC CULTURES

Sample Individualistic Countries	Sample Collectivistic Cultures
United States	Hong Kong
Australia	China
Great Britain	India
Canada	Japan
The Netherlands	West Africa region
Germany	Thailand
New Zealand	Taiwan
Sample Individualistic Values	**Sample Collectivistic Values**
Independence	Interdependence
Individual rights	Obligations to others
Self-sufficiency	Reliance on group
Individual achievement	Group achievement
Independent living	Living with kin
Personal failure leads to shame and guilt	Failing the group leads to shame and guilt

on a continuum, and that within each country there is a wide range of individual differences.

Looking back at the photos from the two cultures in **Figure 1.5**, can you see how learning more about the biopsychosocial model offers increased understanding of ourselves, our friends, and our families, and how it may improve our understanding and sensitivity to other cultures? For example, North Americans generally define *sincerity* as behaving in accordance with our inner feelings, whereas people from collectivist cultures tend to see their equivalent word for sincerity as behavior that conforms to a person's role expectations and duties. (Yamada, 1997). This explains why collectivistic behaviors might appear insincere to a North American.

Careers in Psychology

Many people think of psychologists only as therapists, and it's true that the fields of clinical and counseling psychology do make up the largest specialty areas. However, many psychologists have no connection with therapy. Instead, we work as researchers, teachers, or consultants in academic, business, industry, and government settings, or in a combination of settings. As you can see in **Table 1.3**, there are several career paths and valuable life skills associated with a bachelor's degree in psychology. Of course, your options are even greater if you go beyond the bachelor's degree and earn your master's degree, Ph.D., or Psy.D.—see **Table 1.4**. For more information about what psychologists do—and how to pursue a career in psychology—check out the websites of the American Psychological Association (APA) and the Association for Psychological Science (APS).

TABLE 1.3   WHAT CAN I DO WITH A BACHELOR'S DEGREE IN PSYCHOLOGY?

Top Careers with a Bachelor's Degree in Psychology

Management and administration

Sales

Social work

Labor-relations, personnel and training

Real estate, business services, insurance

Sample Skills Gained from a Psychology Major

Improved ability to predict and understand behavior

Better understanding of how to use and interpret data

Increased communication and interpersonal skills

Increased ability to manage difficult situations and high-stress environments

Enhanced insight into problem behavior

Note that the U.S. Department of Labor predicts only an average rate of growth for psychologists in the next decade. However, the good news is that a degree in our field, and this course in general psychology, will provide you with invaluable lifetime skills.

TABLE 1.4   SAMPLE CAREERS AND SPECIALTIES IN PSYCHOLOGY

Career/Specialty	Description
Biopsychologist/ neuroscientist	Investigates the relationship between biology, behavior, and mental processes, including how physical and chemical processes affect the structure and function of the brain and nervous system
Clinical psychologist	Specializes in the evaluation, diagnosis, and treatment of psychological disorders
Cognitive psychologist	Examines "higher" mental processes, including thought, memory, intelligence, creativity, and language
Comparative psychologist	Studies the behavior and mental processes of nonhuman animals; emphasizes evolution and cross-species comparisons
Counseling psychologist	Overlaps with clinical psychology, but generally works with less seriously disordered individuals and focuses more on social, educational, and career adjustment
Cross-cultural psychologist/ psychological anthropologist	Studies similarities and differences in and across various cultures and ethnic groups
Developmental psychologist	Studies the course of human growth and development from conception to death
Educational psychologist	Studies the processes of education and works to promote the academic, intellectual, social, and emotional development of children in the school environment
Environmental psychologist	Investigates how people affect and are affected by the physical environment
Experimental psychologist	Examines processes such as learning, conditioning, motivation, emotion, sensation, and perception in humans and other animals (Note that psychologists working in almost all other areas of specialization also conduct research)
Forensic psychologist	Applies principles of psychology to the legal system, including jury selection, psychological profiling, assessment, and treatment of offenders

TABLE 1.4 *(Continued)*

Career/Specialty	Description
Gender and/or cultural psychologist	Investigates how men and women and different cultures vary from one another and how they are similar
Health psychologist	Studies how biological, psychological, and social factors affect health and illness
Industrial/organizational psychologist	Applies principles of psychology to the workplace, including personnel selection and evaluation, leadership, job satisfaction, employee motivation, and group processes within the organization
Personality psychologist	Studies the unique and relatively stable patterns in a person's thoughts, feelings, and actions
Positive psychologist	Examines factors related to optimal human functioning
School psychologist	Collaborates with teachers, parents, and students within the educational system to help children with needs related to a disability and/or their academic and social progress; also provides evaluation and assessment of a student's functioning and eligibility for special services
Social psychologist	Investigates the role of social forces in interpersonal behavior, including aggression, prejudice, love, helping, conformity, and attitudes
Sports psychologist	Applies principles of psychology to enhance physical performance

TEST YOURSELF

Introducing Psychology

Completing this self-test and comparing your answers with those in Appendix B provides immediate feedback and helpful practice for exams. Additional interactive self-tests are available at www.wiley.com/college/huffman.

1. Psychology is defined as the _____.
   a. science of conscious and unconscious forces
   b. empirical study of the mind and behavior
   c. scientific study of the mind
   d. scientific study of behavior and mental processes

2. _____ rely on common beliefs, folk wisdom, or even superstitions and do not follow the basics of the scientific method.
   a. Pseudopsychologies
   b. Sociologists
   c. Astronomers
   d. Counselors

3. _____ is generally acknowledged to be the father of psychology.
   a. Sigmund Freud
   b. B. F. Skinner
   c. Wilhelm Wundt
   d. William James

4. Which of the following terms do not belong together?
   a. structuralism, unconscious behavior
   b. behaviorism, observable behavior
   c. psychoanalytic, unconscious conflict
   d. humanism, free will

Test Your Critical Thinking

1. How does psychology's emphasis on science contribute to critical thinking?

2. Psychologists are among the least likely to believe in psychics, palmistry, astrology, and other paranormal phenomena. Why might that be?

3. Which of the seven modern perspectives of psychology do you most agree with? Why?

STUDY TIP

Check & Review

Each major topic concludes with self-test questions that allow you to stop and check your understanding of the important concepts just discussed. Answers appear in Appendix B at the back of the text.

The Science of Psychology

LEARNING OBJECTIVES While reading the upcoming sections, respond to each Learning Objective in your own words. Then compare your responses with those found at www.wiley.com/college/huffman.

DISCUSS the key principles underlying the science of psychology.
- **COMPARE** the fundamental goals of basic and applied research.
- **DESCRIBE** the scientific method, its key terms, and its six steps.
- **REVIEW** psychology's four main goals.

Figure 1.6 **Applied research in psychology** Note how psychological research has helped design safe and more reliable appliances, machinery, and instrument controls (*Psychology Matters*, 2006).

Poorly designed   Well designed

Ⓐ **Spatial correspondence** Controls for stovetops should be arranged in a pattern that corresponds to the placement of the burners.

Ⓑ **Visibility** Automobile gauges for fuel, temperature, and speed should be easily visible to the driver.

Ⓒ **Arrangement of numbers** A top-down arrangement of numbers on a cell phone is more efficient than the bottom-up arrangement on a computer's key board.

Poorly designed   Well designed

Poorly designed   Well designed

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© pictafolio/iStockphoto

In science, research strategies are generally categorized as either *basic* or *applied*. **Basic research** is most often conducted to advance core scientific knowledge, whereas **applied research** is generally designed to solve practical ("real world") problems (**Figure 1.6**). As you'll see in Chapter 6, classical and operant conditioning principles evolved from numerous *basic research* studies designed to advance the general understanding of how human and nonhuman animals learn. In Chapters 14 and 15, you'll also discover how *applied research* based on these principles has been used to successfully treat psychological disorders, such as phobias. Similarly, in Chapter 7, you'll see how basic research on how we create, store, and retrieve our memories has led to practical applications in the legal field, such as a greater appreciation for the fallibility of eyewitness testimony.

Keep in mind that basic and applied research approaches are not polar opposites. Instead, they frequently share similar goals, and their outcomes interact, with one building on the other.

The Scientific Method

Like scientists in any other field, psychologists follow strict, standardized procedures so that others can understand, interpret, and repeat or test their findings. Most scientific investigations consist of six basic steps, collectively based on the **scientific method** (**Step-by-Step Diagram 1.1**).

Have you wondered whether completing the practice testing exercises that follow the Learning Objectives, Test Yourself, and Key Terms in each chapter of this text is worth your time? Have you thought, "Will I get a better grade on my exams if I do these exercises?" How would you use the scientific method to answer these general questions? Starting with Step 1, *Question and Literature Review*, you could go

Basic Research Research that typically focuses on fundamental principles and theories; most often conducted in universities and research laboratories.

Applied Research Research that is generally conducted outside the laboratory; its data are typically used for real world application.

Scientific Method The cyclical and cumulative research process used for gathering and interpreting objective information in a way that minimizes error and yields dependable results.

Step-by-Step Diagram 1.1

The Scientific Method

Scientific knowledge is constantly evolving and self-correcting through application of the scientific method. As soon as one research study is published, the cycle almost always begins again.

Cycle continues — Cycle begins

Step 1
Question and literature review
After identifying a question of interest, the psychological scientist conducts a *literature review*, reading what has been previously published in major professional, scientific journals.

Step 2
Testable hypothesis
The scientist develops a *testable hypothesis*, or a specific prediction about how one factor, or *variable*, is related to another. To be scientifically testable, the variables must be *operationally defined*—that is, stated precisely and in *measurable* terms.

Step 3
Research design
To test the hypothesis, the scientist then chooses the best research design (e.g., experimental, descriptive, or correlational).

Step 4
Data collection and analysis
The data are collected and *statistical analyses* are performed to determine whether or not the findings are *statistically significant*, and if the original hypothesis should be supported or rejected.

Step 5
Publication
The scientist writes up the study and its results and submits it to a *peer-reviewed scientific journal*, which asks other scientists to critically evaluate the research. On the basis of these peer reviews, the study may then be accepted for publication.

Step 6
Theory development
After publication of one or more studies on a topic, researchers may propose a new *theory* or a revision of an existing *theory* to explain the results. This information then leads to new (possibly different) hypotheses and additional methods of inquiry.

Authors — Year study published — Title of study

Cehajic, S., Brown, R., & Castano, E. **(2008).** Forgive and forget? Antecedents and consequences of intergroup forgiveness in Bosnia and Herzegovina. *Political Psychology, 29*, 351–367.

Title of journal — Volume number — Page numbers

Checking references As a critical thinker, do you wonder where psychologists and other scientists publish their findings? Do you question the information found in this and your other college texts? If so, go to the References section at the back of this book and you'll find specific, detailed accounting for each citation throughout this text.

STUDY TIP

The ongoing, circular nature of theory building often frustrates students. In most chapters, you will encounter numerous and sometimes conflicting scientific theories, and you'll be tempted to ask.: Which theory is right?" But, like most aspects of behavior, the "correct" answer is usually an interaction. In most cases, multiple theories contribute to the full understanding of complex concepts.

STUDY TIP

Statistics play a vital role in the scientific method. (see Appendix A at the back of this book).

Hypothesis A tentative and testable explanation (or "educated guess") about the relationship between two or more variables; a testable prediction or question.

Operational Definition A precise description of how the variables in a study will be observed, manipulated, and measured.

to professional journals and read up on the research about practice testing that already exists. To complete Step 2, *Testable Hypothesis*, you would first form an educated guess based on your literature review in Step 1. You would then turn this guess into a statement, called a **hypothesis**, which provides predictions that can be tested in some way. You would also need to explicitly state how each of the variables in your hypothesis will be **operationally defined** (observed, manipulated, and measured). For example, a better grade on my exams might be operationally defined as earning one letter grade higher than the letter grade on my previous exam.

Using your initial question about the value of the practice testing exercises, your hypothesis and operational definitions might be: "Students who spend two hours studying Chapter 1 in this text and one hour completing all the practice testing options will earn higher scores on a standard academic exam than students who spend

three hours using free-choice study techniques without completing the practice testing options."

For Step 3, *Research Design*, you would then most likely choose an experimental research design and solicit 100 volunteers from various classes. Fifty of these volunteers should be randomly assigned to Group 1 (practice testing), and the other 50 to Group 2 (no practice testing). After both groups study for three hours, you would present and score a 20-point quiz, followed by a statistical analysis (Step 4—*Data Collection and Analysis*) to determine whether the difference in test scores between the two groups is **statistically significant**. To be statistically significant, the difference between the groups must be large enough that the result is probably not due to chance. In Step 5, *Publication*, you could publish your research, and then you go on to further investigate additional study techniques that might contribute to theory development on the most effective study methods, Step 6—*Theory Development*. [You'll be interested to know that research does exist on the superiority of practice testing (Test Yourself) on retention of material and improved exam scores (Bourne & Healy, 2014; Dunlosky et al., 2013; Karpicke & Smith, 2012), which is why we've emphasized it in this text.]

Note also in the Step-by-Step Diagram 1.1 that the scientific method is cyclical and cumulative. Scientific progress comes from repeatedly challenging and revising existing theories, and building new ones. If numerous scientists, using different procedures or participants in varied settings, can repeat, or *replicate*, a study's findings, there is increased scientific confidence in the findings. If the findings cannot be replicated, researchers look for other explanations and conduct further studies. When different studies report contradictory findings, researchers may average or combine the results of all such studies, and reach conclusions about the overall weight of the evidence, a popular statistical technique called **meta-analysis**. For example, one recent meta-analysis found that a healthy diet, high-quality preschool, and interactive reading with parents can all lead to increases in children's intelligence (Protzko et al., 2013).

After many related findings have been collected and confirmed, scientists may generate a **theory** to explain the data through a systematic, interrelated set of concepts. In common usage, the term *theory* is often assumed to mean something is only a hunch or someone's personal opinion. In reality, scientific theories are evidence based, rigorously tested, and self-correcting (**Figure 1.7**).

Psychology's Four Main Goals

In contrast to *pseudopsychologies*, which we discussed earlier and which rely on unsubstantiated beliefs and opinions, psychology is based on rigorous scientific methods. When conducting their research, psychologists have four major goals—to *describe*, *explain*, *predict*, and *change* behavior and mental processes:

1. **Description** Description tells what occurred. In some studies, psychologists attempt to *describe*, or name and classify, particular behaviors by making careful scientific observations. Description is usually the first step in understanding behavior. For example, if someone says, "Boys are more aggressive than girls," what does that mean? The speaker's definition of aggression may differ from yours. Science requires specificity.

2. **Explanation** An explanation tells why a behavior or mental process occurred. *Explaining* a behavior or mental process requires us to discover and understand its causes. One of the most enduring debates in science is the **nature–nurture controversy** (Chang & Ota Wang, 2014; Gruber, 2013). Are we controlled by biological and genetic factors (the nature side) or by the environment and learning

Statistical Significance A statistical statement of how likely it is that a study's result occurred merely by chance.

Meta-Analysis A statistical technique for combining and analyzing data from many studies in order to determine overall trends.

Theory An organized, interrelated set of concepts that explain a phenomenon or body of data.

Nature–Nurture Controversy An ongoing dispute about the relative contributions of nature (heredity) and nurture (environment) in determining the development of behavior and mental processes.

Theories gone wild! In the 1800s, many believed in *phrenology*, a theory that personality could be "read" from bumps on the skull. Thanks to the self-correcting nature of scientific research, this theory was later discredited.

Bettmann/Corbis Images
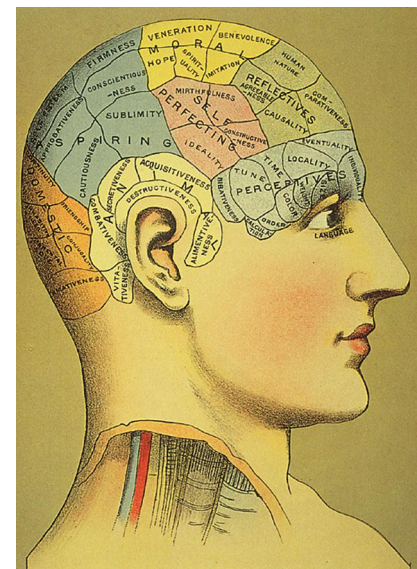
Figure 1.7 Opinions versus facts—science to the rescue! Early experiments, conducted primarily by *Nicolaus Copernicus* (1473–1543), led to a collection of facts and the ultimate theory that the Earth was not the center of the universe (as generally assumed at time). Instead, the Earth and all other planets rotate around the sun in concentric circles **(Figure a)**. Later scientists (astronomers Johannes Kepler and Tycho Brahe) built on this Copernican (heliocentric) theory. And their research and calculations revealed that the Copernican orbits were not circular, but rather elliptical **(Figure b)**. Today, researchers have expanded the theory even further by demonstrating that our sun is not the center of the universe, but only a part of a galaxy that in turn is only one of many billions. Can you see how these incremental changes illustrate the value of scientific theories and their ever changing, self-correcting nature?

a.

b.
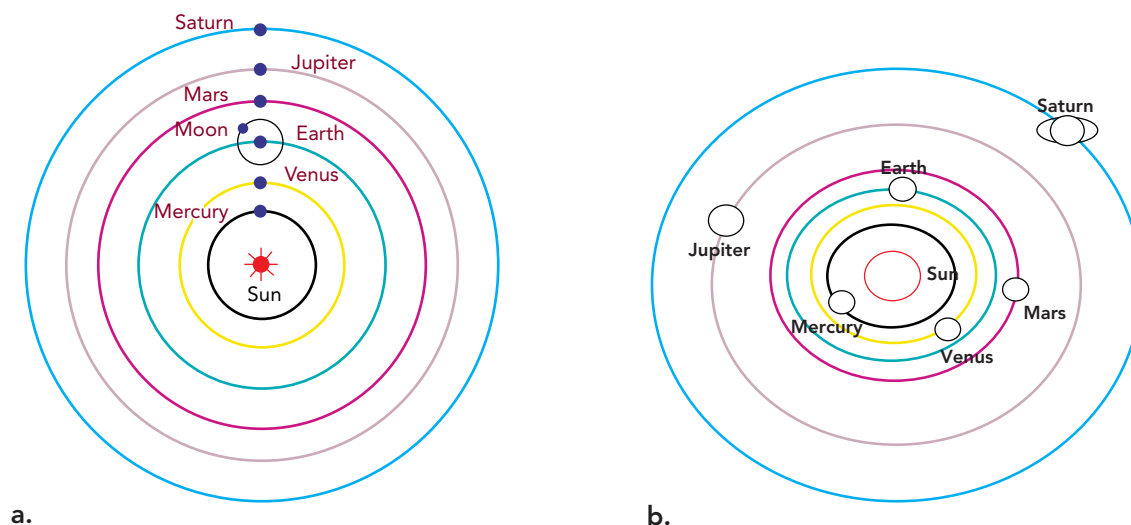
(the nurture side)? As you will see throughout the text, psychology (like all other sciences) generally avoids "either or" positions and focuses instead on *interactions*. Today, almost all scientists agree that most psychological, and even physical, traits reflect an interaction between nature and nurture. For example, research suggests numerous interacting causes or explanations for aggression, including culture, learning, genes, brain damage, and testosterone (Caprara et al., 2014; Longino, 2013; Pournaghash-Tehrani, 2011).

3. **Prediction** Psychologists generally begin with description and explanation (answering the "whats" and "whys"). Then they move on to the higher-level goal of *prediction*, identifying "when" and under what conditions a future behavior or mental process is likely to occur. For instance, knowing that alcohol leads to increased aggression (Parker & McCaffree, 2013; Shorey et al., 2014; Testa & Derrick, 2013), we can predict that more fights will erupt in places where alcohol is consumed than in places where it isn't.

4. **Change** For some people, change as a goal of psychology brings to mind evil politicians or cult leaders brainwashing unknowing victims. However, to psychologists, *change* means applying psychological knowledge to prevent unwanted outcomes or bring about desired goals. In almost all cases, change as a goal of psychology is positive. Psychologists help people improve their work environment, stop addictive behaviors, become less depressed, improve their family relationships, and so on. Furthermore, as you may know from personal experience, it is very difficult (if not impossible) to change someone's attitude or behavior against her or his will. (*Here is an old joke*: Do you know how many psychologists it takes to change a light bulb? *Answer*: None. The light bulb has to want to change.)

In sum, the goal of psychology is to answer four basic questions about behavior and mental processes:

1. *What* is their nature? (**Description**)
2. *Why* do they occur? (**Explanation**)
3. *When* will they occur? (**Prediction**)
4. How can we *change* them? (**Change**)

TEST YOURSELF

The Science of Psychology

Completing this self-test and comparing your answers with those in Appendix B provides immediate feedback and helpful practice for exams. Additional interactive self-tests are available at www.wiley.com/college/huffman.

1. If you conducted a study on areas of the brain most affected by drinking alcohol, it would be _____ research.

    a. unethical
    b. basic
    c. pseudopsychology
    d. applied

2. A(n) _____ provides a precise definition of how the variables in a study will be observed and measured.

    a. meta-analysis
    b. theory
    c. independent observation
    d. operational definition

3. The goal of _____ is to tell what occurred, whereas the goal of _____ is to tell when.

    a. health psychologists; biological psychologists
    b. description; prediction
    c. psychologists; psychiatrists
    d. pseudopsychologists; clinical psychologists

4. Label the six steps in the scientific method.
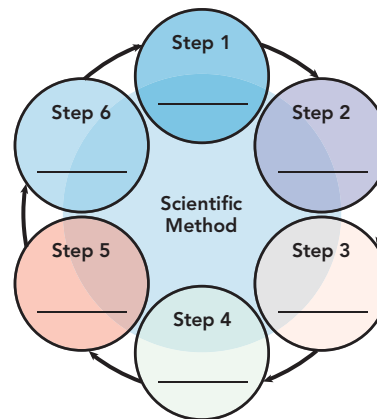
Test Your Critical Thinking

1. How does psychology's emphasis on the scientific method compare and contrast with your current or previous science courses?

2. What is the difference between a scientific theory, an opinion, and a hunch?

3. Nonhuman animals are sometimes used in psychological research when it would be impractical or unethical to use human participants. What research questions might require the use of nonhuman animals?

Research Methods
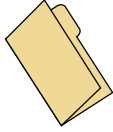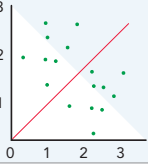
LEARNING OBJECTIVES While reading the upcoming sections, respond to each Learning Objective in your own words. Then compare your responses to those found at www.wiley.com/college/huffman.

SUMMARIZE psychology's three major research methods.
- **REVIEW** descriptive research and its four key methods.
- **DISCUSS** correlational research and the correlation coefficient.
- **IDENTIFY** the key terms and components of experimental research.
- **DESCRIBE** the ethical concerns and guidelines for psychological research.

Having studied the scientific method and psychology's four main goals, we can now examine how psychologists conduct their research. Psychologists generally draw on three major research methods—*descriptive*, *correlational*, and *experimental* (**Table 1.5**).

TABLE 1.5 PSYCHOLOGY'S THREE MAJOR RESEARCH METHODS

Method	Purpose	Advantages	Disadvantages	
Descriptive (naturalistic observation, survey, case study, archival research)	Observe, collect, and record data (meets psychology's goal of *description*)	Minimizes artificiality, makes data collection easier, allows description of behavior and mental processes as they occur	Less control over variables, cannot identify cause and effect, potential biases (Figure 1.13)	
Correlational (statistical analyses of relationships between variables)	Identify strength and direction of relationships, and assess how well one variable predicts another (meets psychology's goal of *prediction*)	Helps clarify relationships between variables that cannot be examined by other methods and allows prediction	Less control over variables, cannot identify cause and effect, possible illusory correlation, potential biases (Figure 1.13)	
Experimental (manipulation and control of variables)	Identify cause and effect (meets psychology's goal of *explanation*)	Allows researchers to have precise control over variables, and provides explanation of the causes of behavior and mental processes	Ethical concerns, practical limitations, artificiality of lab conditions, uncontrolled variables may confound results, and potential biases (Figure 1.13)	

Note that the three methods are not mutually exclusive. Researchers may use one, two, or all three methods to explore the same topic.

Each of these approaches has advantages and disadvantages, and psychologists often use variations of all three methods to study a single problem. In fact, when multiple approaches lead to similar conclusions, scientists have an especially strong foundation for concluding that one variable does affect another in a particular way (Cohen, 2014).

Descriptive Research

Almost everyone observes and describes others in an attempt to understand them, but in conducting **descriptive research**, psychologists do so systematically and scientifically. The key types of descriptive research are *naturalistic observation*, *survey*, *case study*, and *archival research*.

Naturalistic Observation

When conducting **naturalistic observation**, researchers systematically observe and record participants' behavior in their natural setting, without interfering. Many settings lend themselves to naturalistic observation, from supermarkets to airports to outdoor settings. For example, Jane Goodall's classic naturalistic observations of wild chimpanzees provided invaluable insights into their everyday lives, such as their use of tools, acts of aggression, demonstrations of affection, and, sadly, even the killing of other chimps' babies (infantacide). In Chapter 5, you'll read about a study in which researchers used naturalistic observation to examine whether drivers talking on a cell phone were less likely to come to a complete stop at a stop sign (Strayer et al., 2011). Can you guess what they found?

The chief advantage of naturalistic observation is that researchers can obtain data about natural behavior rather than about behavior that is a reaction to an artificial experimental situation. But naturalistic observation can be difficult and time-consuming, and the lack of control by the researcher makes it difficult to conduct observations for behavior that occurs infrequently.

For a researcher who wants to observe behavior in a more controlled setting, *laboratory observation* has many of the advantages of naturalistic observation, but with greater control over the variables (**Figure 1.8**).

Descriptive Research A research method in which the researcher observes and records behavior and mental processes without manipulating variables.

Naturalistic Observation The process of observing and recording a research participant's behavior and mental processes in his or her natural setting, without interfering.

Survey

Psychologists use **surveys** to ask people to report their behaviors, opinions, and attitudes (Cohen, 2014; Evans & Rooney, 2014). In Chapter 12 you'll read about a study in which researchers interviewed 3- to 6-year-old girls about their preference for using game pieces depicting thinner or heavier women when playing Candy Land to measure preference for the thin ideal (Harriger et al., 2010). In Chapter 11, you'll read about the use of survey research to study how a person's first sexual experience may impact subsequent sexual relationships (Smith & Shaffer, 2013).

Keep in mind that the survey method also includes in-depth *interviews*, such as Kinsey's research interview of over 18,000 participants asking detailed questions about their sexual activities and preferences (Chapter 11). In addition, *psychological testing* is often considered another form of the survey method. The SAT or ACT tests you took in high school, and the intelligence and personality tests described in Chapters 8 and 13, are all psychological tests designed to measure your specific behaviors or individual characteristics.

A key advantage of the general survey method is that researchers can gather a large amount of data from many more people than is generally possible with other research designs. Unfortunately, most surveys rely on self-reported data, and not all participants are honest. As you might imagine, people are especially motivated to give less-than-truthful answers when asked about highly sensitive topics, such as infidelity, drug use, and pornography.

Case Study

What if a researcher wants to investigate photophobia (fear of light)? In such a case, it would be difficult to find enough participants to conduct an experiment or to use surveys or naturalistic observation. For rare disorders or phenomena, researchers try to find someone who has the problem and study him or her intensively. This type of in-depth study of a single research participant, or a small group of individuals, is called a **case study** (Yin, 2014). In Chapter 9, we'll share a fascinating case study that examined the impact of severe neglect during childhood on language acquisition. This study obviously could not be conducted using another method, for ethical reasons, and because of the rarity of such severe deprivation.

Archival Research

The fourth type of descriptive research is **archival research**, in which researchers study previously recorded data. For example, using preexisting data from more than 50 years of Major League Baseball games, researchers revealed that more batters are deliberately hit by pitchers on hot days than on cooler days (Larrick et al., 2011). Interestingly, the new "digital democracy," based on spontaneous comments on Twitter or Facebook, may turn out to be an even better method of research than the traditional random sampling of adults.

Figure 1.8 Laboratory observation In this type of observation, the researcher brings participants into a specially prepared room in the laboratory, with one-way mirrors, or inconspicuous, hidden cameras, and microphones. Using such methods, the researcher can observe school children at work, families interacting, or the like.

Jeffrey Greenberg/Photo Researchers

Survey A research technique that questions a large sample of people to assess their behaviors and mental processes.

Case Study An in-depth study of a single research participant or a small group of individuals.

Archival Research A descriptive research approach that studies existing data to find answers to research questions.

"What I drink and what I tell the pollsters I drink are two different things."

Leo Cullum/cartoonbank.com. All Rights Reserved

Researchers who used a massive archive of billions of stored data from Twitter found "tweet share" predicted the winner in 404 out of 435 competitive races in the U.S. House elections in 2010 (DiGrazia et al., 2013). Apparently, just the total amount of discussion—good or bad—is a very good predictor of votes.

Correlational Research

Data collected from descriptive research provides invaluable information on behavior and mental processes because they describe, or demonstrate, that a relationship exists between the variables of interest. However, descriptive data cannot tell us the *direction* or *strength* of that relationship. For this we need **correlational research**. As the name implies, when any two variables are co-related, a change in one is accompanied by a change in the other. For example, researchers in one study examined the link between happiness and age in a sample of more than 5,000 people across the United States (Sutin et al., 2013). This study revealed that, contrary to common stereotypes, happiness actually increases with age!

Another important advantage of correlational research is that it allows us to make predictions about one variable based on knowledge of another. For instance, suppose scientists used naturalistic observation and noted a relationship between the use of cell phones and the number of traffic accidents, or between the hours of television viewing and performance on exams. The researchers then might use the correlational research method to carefully examine the direction and strength of the relationship using a statistical formula that gives a **correlation coefficient** (**Concept Organizer 1.1**).

Looking closely at the right-hand side of the chart in Concept Organizer 1.1, you'll note that while the numbers in the first column (+1.00 to −1.00) describe the *strength* of the relationship between two variables, what's often overlooked is the second column, which shows the actual percentage of *variance* (or how widely individuals in a group vary). We calculate this variance by multiplying the correlation number by itself (in this example .5 × .5 = 25%). It's important to understand this because people often over-interpret popular examples such as the .5 correlation between IQ (intelligence quotient) and GPA (grade point average) or the .4 correlation between IQ and income. Now that you understand more about correlations, you can see that your GPA has only a moderate relationship with your IQ, which only accounts for 25% of the variance. Also note that there is an even smaller relationship between your overall income and your IQ, which accounts for only 16% of the variance. The good news is that many factors other than IQ explain both GPA and income—mainly hard work, motivation, and perseverance.

Problems with Correlations

As you've just seen with the examples of correlations between IQ and GPA, or IQ and income, correlations are sometimes weak and not very useful. In addition, sometimes a mathematical correlation can be found between two events or variables that have no direct connection—yet people may wrongly infer that they do. Therefore, it's very important to note two major cautions concerning correlations.

1. **Correlation does NOT prove causation!** Cities with a greater number of churches have a higher crime rate. Does this mean that an increase in churches leads to more crime? Of course not! Instead, a *third variable* (increased population) leads to both more churches and more crime. Similarly, sales of ice cream are highest when the rate of drownings in city swimming pools is highest. Once again, a third variable (hot weather) leads to more ice cream sales and to more drownings. This mistake of confusing correlation with causation is often referred to as the **third-variable problem**, which refers to the fact that, in any observed relationship, there's always a possibility that a known or unknown third variable (also known as

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Correlational Research Research that measures the *direction* and *strength* of a relationship (if any) between two or more variables in order to determine how well one variable predicts another.

Correlation Coefficient A number from −1.00 to +1.00 that indicates the direction and strength of the relationship between two variables.

Third-Variable Problem A form of confounding in which a third factor leads to a mistaken perception of a causal relationship between two other variables.

STUDY TIP

If you're confused about these two problems with correlations, note that with the *third-variable problem*, an actual correlation does exist between two variables, but a third factor might be responsible for their connection. In contrast, with an *illusory correlation* there is NO factual connection between two variables—the illusory connection is totally FALSE.

Concept Organizer 1.1
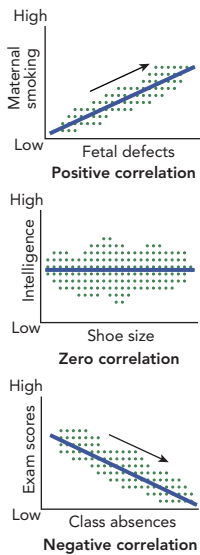
Interpreting a Correlation Coefficient

A correlation coefficient is a number from −1.00 to +1.00 that represents the direction and strength of a relationship between two variables. Understanding this is crucial to becoming an educated consumer of research.

- **Direction of the correlation** (left-hand column) The + or − sign in the correlation co-efficient indicates the *direction* of the correlation, either positive or negative, which is often depicted in graphs called *scatterplots* (shown in the left column of the table below). Each dot on these graphs represents one participant's score on both variables.

- **Strength of the correlation** (right-hand column) A correlation of +1.00 and a −1.00 mag-nitude both indicate the strongest possible relationship. As the number decreases and gets closer to 0.00, the relationship weakens. We interpret correlations close to zero as representing no relationship between the variables—like the "relationship" between bro-ken mirrors and supposed years of bad luck.

Direction of the correlation	Strength of the Correlation	
High Maternal smoking Low — Fetal defects **Positive correlation**	+1.00	Perfect positive relationship (100% of the variance)
	+.80 to +.99	Very strong positive relationship (64–98% of the variance)
	+.60 to +.79	Strong positive relationship (36–62% of the variance)
	+.40 to +.59	Moderate positive relationship (16–35% of the variance)
High Intelligence Low — Shoe size **Zero correlation**	+.20 to +.39	Weak positive relationship (4–15% of the variance)
	0.00	No relationship (0% of the variance)
	−.20 to −.39	Weak negative relationship (4–15% of the variance)
	−.40 to −.59	Moderate negative relationship (16–35% of the variance)
High Exam scores Low — Class absences **Negative correlation**	−.60 to −.79	Strong negative relationship (36–62% of the variance)
	−.80 to −.99	Very strong negative relationship (64–98% of the variance)
	−1.00	Perfect negative relationship (100% of the variance)

TEST YOUR CRITICAL THINKING

Can you identify whether each of the following pairs most likely has a posi-tive, negative, or zero correlation?

1. Health and exercise
2. Hours of TV viewing and student grades
3. Happiness and helpfulness
4. Hours of sleep and number of friends
5. Extraversion and loneliness

Answers: 1. positive, 2. negative, 3. positive, 4. zero, 5. negative

Illusory Correlation The tendency to mistakenly see two statistically unrelated events as being correlated, when in reality no such association exists.

Figure 1.9 Correlation versus causation—The third variable problem Research has found a strong correlation between stress and cancer (Chapter 3). However, this correlation does not tell us whether stress causes cancer, whether cancer causes stress, or whether other known and unknown factors, such as smoking, drinking, or pesticides, could contribute to both stress and cancer. Can you think of a way to study the effects of stress on cancer that is not correlational and still ethical?
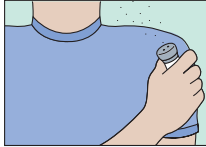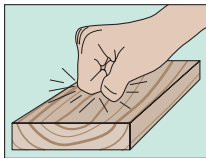
a *confounding variable*) may be responsible for (*confounding*) the relationship. Would you like a less obvious and more commonly confused example? See **Figure 1.9**.

2. **Correlations are sometimes illusory—meaning they don't exist!** In the previous *third-variable problem*, a correlation does exist between two variables, but a third factor may be responsible for their apparent connection. In this second 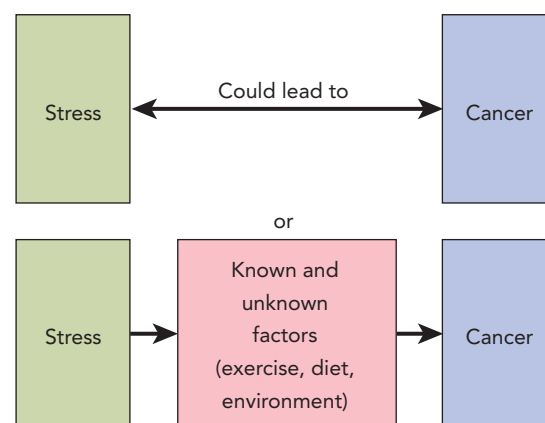problem, there is NO factual connection between two variables—the relationship is the result of random coincidence and/or misperception. Popular beliefs, such as infertile couples often conceiving after an adoption, or that certain slot machines are more likely to pay off than others, are called **illusory** (false) **correlations**. Interestingly, superstitions, such as breaking a mirror supposedly leading to 7 years of bad luck, or a sports fan who always wears his lucky team sports jacket because he believes it will bring the team good luck, are additional examples of illusory correlations. We mistakenly perceive an association that factually does not exist. Unfortunately, these and other well-known superstitions (**Table 1.6**) persist because there is no logical way to empirically demonstrate their falsity.

    Why are beliefs in illusory correlations so common? As you'll discover in upcoming chapters, we tend to focus on the most noticeable (salient) factors when explaining the

TABLE 1.6 SUPERSTIONS AS ILLUSORY CORRELATIONS

	Behavior	Superstition
	Wedding plans: *Why do brides wear something old and something borrowed?*	The something old is usually clothing that belongs to an older woman who is happily married. Thus, the bride will supposedly transfer that good fortune to herself. Something borrowed is often a relative's jewelry. This item should be golden, because gold represents the sun, which was once thought to be the source of life.
	Spilling salt: *Why do some people throw a pinch of salt over their left shoulder?*	Years ago, people believed good spirits lived on the right side of the body and bad spirits on the left. When a man spilled salt, he believed his guardian spirit had caused the accident to warn him of evil nearby. At the time, salt was scarce and precious. Therefore, to bribe the spirits who were planning to harm him, he would quickly throw a pinch of salt over his left shoulder.
	Knocking on wood: *Why do some people knock on wood when they're speaking of good fortune or making predictions?*	Down through the ages, people have believed that trees were homes of gods, who were kind and generous if approached in the right way. A person who wanted to ask a favor of the tree god would touch the bark. After the favor was granted, the person would return to knock on the tree as a sign of thanks.

causes of behavior. Paying undue attention to the dramatic (but very rare) instances when infertile couples conceive after adoption, or when a gambler wins a large payout on one specific slot machine, are both examples of the *saliency bias* (see Chapter 16). In addition to this saliency bias, we also more often note and remember events that confirm our expectations and ignore the "misses." This is known as the *confirmation bias* (see the Critical Thinking Exercise at the end of this chapter and in Chapters 6 and 8).

Finally, keep in mind that some misperceptions can be both a third-variable problem AND an illusory correlation. For example, many people believe that crime increases during a full moon. Although there are a few studies that show some correlation, the vast majority of scientific studies find it is illusory—there is NO actual correlation (Aamodt, 2008; Biermann et al., 2009; Rotton & Kelly, 1985; Schafer et al., 2010). This full moon example also illustrates the confirmation bias because we tend to note the times when crimes are committed during a full moon, and ignore similar crimes committed at other times.

The important thing to remember while reading research reports in this or any textbook, or reports in the popular media, is that observed correlations may be illusory and that correlational research can NEVER provide a clear cause and effect relationship between variables. Always consider that a third factor might be a better explanation for a perceived correlation. To find causation, we need the experimental method.

The Value of Correlations

After discussing the problems and limits of correlational research, it's important to point out that it's still an incredibly valuable research method. In addition to providing more accurate predictions, correlational studies often point to *possible* causation, which is followed up with later experiments. For example, smoking cigarettes and drinking alcohol while pregnant are highly correlated with birth defects (Agopian et al., 2012; Källén, 2014; Pruett et al., 2013). This strong correlation has led to additional research and supporting evidence, which has helped convince women to avoid these drugs while pregnant—thus preventing many birth defects.

Experimental Research

As you've just seen, correlational studies are important because they reveal *associations* between variables. However, to determine *causation* (what causes what), we need **experimental research**. For example, in Chapter 15, you'll learn how experiments can help test the effectiveness of a particular psychotherapy approach at helping a spider-phobic person become comfortable enough to touch a tarantula (Hauner et al., 2012).

Experiments are considered the "gold standard" for scientific research because only through an experiment can researchers isolate and then examine a single factor's effect on a particular behavior (Cohen, 2014; Goodwin & Goodwin, 2013). To understand all the important key terms and the general set up for an experiment, it helps to imagine yourself as a psychologist interested in determining how texting while driving an automobile might affect the number of traffic accidents. You begin by reviewing the Step-by-Step Diagram 1.1 for the scientific method, which we discussed earlier in this chapter. After *reviewing the literature* and developing your *testable hypothesis* (Steps 1 and 2 of the scientific method), you then decide to use an experiment for your *research design* (Step 3 of the scientific method).

Now carefully study the very simple experimental set up in the **Step-by-Step Diagram 1.2**. You start by developing your *hypothesis*, which we defined earlier as a tentative and testable explanation (or "educated guess") about the relationship between two or more variables. Next, you will assign your research participants to either the **experimental group** or the **control group**. Note that having at least two groups allows the performance of one group to be compared with that of another.

Experimental Research A carefully controlled scientific procedure that involves the manipulation of variables to determine cause and effect.

Experimental Group The group that is manipulated (i.e., receives treatment) in an experiment.

Control Group The group that is not manipulated (i.e., receives no treatment) during an experiment.

Independent Variable (IV) The variable that is manipulated to determine its causal effect on the dependent variable; also called the treatment variable.

Dependent Variable (DV) The variable that is observed and measured for change; the factor that is affected by (or dependent on) the independent variable.

Sample Bias A bias that may occur when research participants are unrepresentative of the larger population.

Random Assignment A research technique that involves using chance to assign participants to experimental or control conditions, thus minimizing the possibility of biases or preexisting differences in the group.

Confounding Variable An extraneous factor or variable that, if not controlled, could contaminate the results of an experiment.

Next, you arrange the factors, or *variables*, you will control and manipulate, which are called **independent variables (IV)**, as well as the variables you plan to measure and examine for possible change, known as **dependent variables (DV)**. Those who are assigned to the *experimental group* receive the IV, which is the treatment under study and the variable being manipulated by you—the experimenter. (In this example, the IV would be texting while driving in the driving simulator.) Those assigned to the *control group* will be treated in every way just like the experimental group. The only difference is that they would NOT text while driving. You, the experimenter, would then ask all participants to drive for a given amount of time (e.g., 30 minutes in the driving simulator). While they're driving, you would record the number of simulated traffic accidents (the DV). [Note: The goal of any experiment is to learn how the dependent variable is *affected by* (depends on) the independent variable.]

As a final step, you'll compare the results from both groups and report your findings to a peer-reviewed scientific journal like the ones found in the reference list at the end of this book. Keep in mind that because the control group was treated exactly like the experimental group, any significant difference in the number of traffic accidents (the DV) between the two groups would be the result of the IV. In contrast, if you found little or no difference between the groups, you would conclude that texting does not affect traffic accidents.

Before going on, it's important to note that actual research does find that cell phone use, particularly texting, while driving definitely leads to increased accidents with serious or fatal consequences (e.g., Cohen & Zhu, 2013; Marino, 2012). Unfortunately, many drivers don't realize that texting involves a minimum of 5 seconds, which means that if you're driving at 55 mph, you'll travel the length of a football field without looking at the road! Did you also know that text messaging makes a crash up to 23 times more likely to happen, compared to talking or listening on a cell phone which increases your risk by 1.3 times (Marino, 2012)? Hopefully, these statistics will remind all of us that texting, while driving, is simply not worth it. In other words: "Let's put down the phone and drive."

Experimental Safeguards

As you've just seen, every experiment is designed to answer essentially the same question: Does the independent variable (IV) *cause* the predicted change in the dependent variable (DV)? To answer this question, the experimenter must establish several safeguards. In addition to the previously mentioned controls within the experiment itself, a good scientific experiment also protects against potential sources of error from both the researcher and the participant.

How can we prevent bias and errors? Let's start with **sample bias**, which occurs when a particular group of participants does not accurately reflect the composition of the larger population from which they are drawn. For example, some critics suggest that psychological literature is biased because it too often uses college students as participants. We counteract this potential bias with *representative sampling*, which involves selecting participants who constitute a representative sample of the entire population of interest.

Even if we avoid sample bias with *representative sampling*, we can still introduce bias when assigning participants to either the experimental or the control group. As you can see in Step 2 of Step-by-Step Diagram 1.2, using a chance or random system, such as a coin toss, further avoids bias because each participant is equally likely to be assigned to any particular group, a technique called **random assignment**.

It's also critical to control for extraneous, **confounding variables** (such as time of day, lighting conditions, and room temperature). These variables must be held

Step-by-Step Diagram 1.2

Experimental Research Design

When designing an experiment, researchers must follow certain steps to ensure that their results are scientifically meaningful. In this example, researchers want to test whether texting on a cell phone while driving causes more traffic accidents.

1 The experimenter begins by identifying the hypothesis.

2 In order to avoid sample bias, the experimenter first selects research participants who constitute a representative sample of the entire population of interest. Next, the experimenter randomly assigns these participants to two different groups.

3 Having an experimental group that receives the treatment, and a control group that does not receive the treatment, allows a baseline comparison of responses between the two groups.

4 Both the experimental and control groups are assigned to a driving simulator. The experimental group texts while driving, whereas the control group does not text. Texting or not texting is the independent variable (IV).

5 The experimenter then counts the number of simulated traffic accidents for each group, which is the dependent variable (DV).

6 The experimenter relates differences in texting while driving or not texting (IV) to the number of traffic accidents (DV).
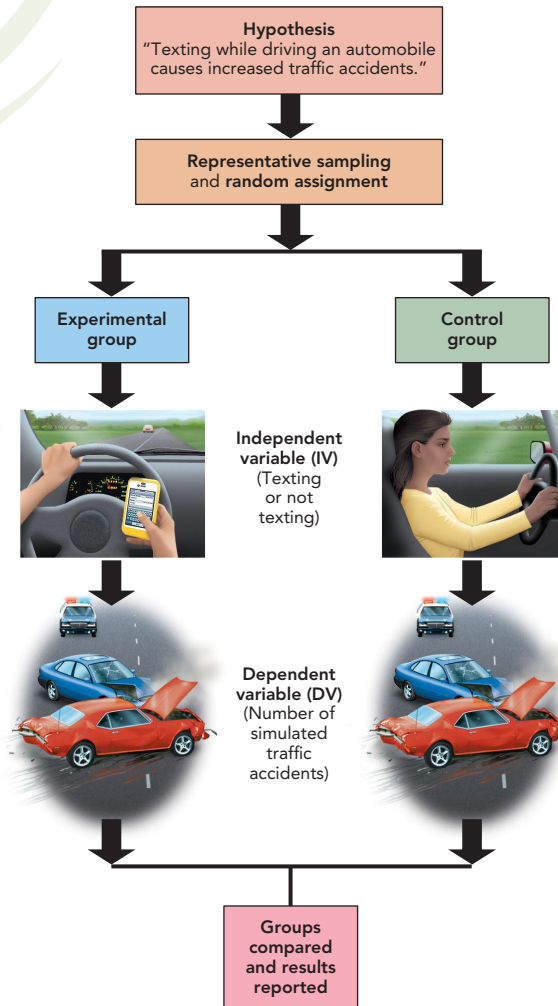
Hypothesis
"Texting while driving an automobile causes increased traffic accidents."

Representative sampling and random assignment

Experimental group

Control group

Independent variable (IV) (Texting or not texting)

Dependent variable (DV) (Number of simulated traffic accidents)

Groups compared and results reported

STUDY TIP

Because the IV is independent and varied by the experimenter, it is called independent. The DV is called dependent because the behavior (or outcome) exhibited by the participants is assumed to depend on manipulations of the IV.

STUDY TIP

To help you remember the independent and dependent variables (IV and DV), carefully study these drawings and create a visual picture in your own mind of how:

The experimenter "manipulates" the IV to determine its causal effect on the DV.

The experimenter "measures" the DV, which "depends" on the IV.

TRY THIS YOURSELF

Understanding Random Assignment and Confounding Variables

Have you wondered if the decorations and overall ambiance of a restaurant could affect your eating behavior? To answer this question, a group of researchers modified the environment in one section of a fast food restaurant by dimming the lights and adding relaxing music, plants, candles, and tablecloths. They then randomly assigned customers to sit in either the original section of the restaurant or this new section (Wansink & Van Ittersum, 2012). All participants freely ordered whatever food they preferred, but those in the more relaxing part of the restaurant took longer to eat their meal and ate 18% fewer calories.

Can you see how the *random assignment* of the customers controlled for any potential *confounding variables*? All participants freely entered the same restaurant, and each individual was equally likely to be assigned to either section in the restaurant. Thanks to these controls, the researchers can legitimately conclude that the *independent variable* (IV) (relaxing versus standard restaurant condition) caused the change in the *dependent variables* (DVs) (time spent eating and number of calories consumed).

As a critical thinker, do you recognize how confounding variables in an experiment are essentially the same as the third variable problem associated with correlational research? Whenever we observe a relationship between variables, we need to recognize the possibility that an unwanted, third variable might have unintentionally affected (confounded) the results.
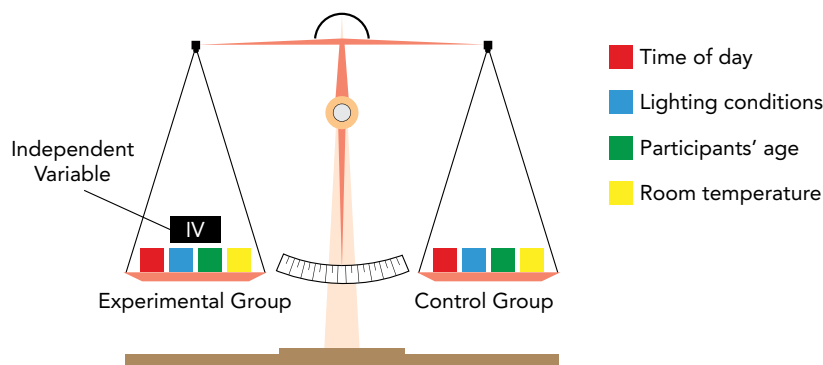
Experimenter Bias Bias that occurs when a researcher influences research results in the expected direction.

constant across both the experimental and control groups, so that they do not affect the different groups' results (**Figure 1.10**).

In addition to the controls mentioned above, a good scientific experiment has other invaluable techniques for protecting against potential sources of error from both the researcher and the participants. For example, if experimenters' beliefs and expectations are not controlled for, they can affect participants' responses, producing flawed results. Imagine what might happen if an experimenter breathed a sigh of relief when a participant gave a response that supported the researcher's hypothesis. One way to prevent such **experimenter bias** from destroying the validity of participants' responses is to establish objective methods for collecting and recording data, such as using computers to present stimuli and record responses.

Consider the case of *Clever Hans*, the famous mathematical "wonder horse" (Rosenthal, 1965) (**Figure 1.11**). When asked to multiply 6 times 8, minus 42, Hans

Figure 1.10 Controlling for confounding variables Recognizing that certain outside variables may affect their experiment, researchers strive for balance between the experimental and control groups, making sure the variables are the same for both. Once balance is achieved, and the independent variable (IV) is added to the experimental group, the experimenters check to see if the scale's balance is significantly disrupted. If so, they can then say that the IV *caused* the change. However, if the IV is not "heavy" enough to make a significant difference, then the experiment "failed," and experimenters go back to further refine their approach—or start over.

Independent Variable

IV

Experimental Group   Control Group

🟥 Time of day
🟦 Lighting conditions
🟩 Participants' age
🟨 Room temperature

Figure 1.11 Can a horse add, multiply, and divide? Clever Hans and his owner, Mr. Von Osten, convinced many people that this was indeed the case. Can you see how this provided an early example of experimenter bias? See the text for an explanation.

Martha Lazar/The Image Bank/Getty Images

would tap his hoof 6 times. Or if asked to divide 48 by 12, add 6, and take away 6, he would tap 4 times. Even when Hans's owner was out of the room and others asked the question, he was still able to answer correctly. How did he do it? Researchers eventually discovered that all questioners naturally lowered their heads to look at Hans's hoof at the end of their question. And Hans had learned that this was a signal to start tapping. When the correct answer was approaching, the questioners also naturally looked up, which signaled Hans to stop.

Experimenters also can skew their results if they assume that behaviors typical in their own culture are typical in all cultures—a bias known as **ethnocentrism**. One way to avoid this problem is to have researchers from two cultures each conduct the same study twice, once with their own culture and once with at least one other culture. This kind of *cross-cultural sampling* isolates group differences in behavior that stem from researchers' ethnocentrism.

We've seen that researchers can inadvertently introduce error (the experimenter bias). Unfortunately, participants also can produce a similar error, called **participant bias**. For example, research measuring accuracy of reports of alcohol consumption demonstrates that heavy drinkers tend to under-report how much alcohol they are consuming (Northcote & Livingston, 2011; Wetterling et al., 2014). In this case, participants obviously tried to present themselves in a good light—called the *social desirability response*. As you'll discover in the next section on ethical guidelines, one of the most effective (and controversial) ways of preventing this type of participant bias is to temporarily deceive participants about the true nature of the research project. For example, in studies examining when and how people help others, participants may not be told the true goal of the study because they might try to present themselves as more helpful than they actually would be in real life. Researchers also attempt to control for both *experimenter* and *participant bias* by offering anonymous participation, along with guarantees of privacy and confidentiality.

Perhaps the most common technique to minimize bias is known as **single-blind** and **double-blind studies**. As you can see in **Figure 1.12**, this approach requires experimenters to keep participants and/or experimenters blind (unaware) of the treatment or condition to which the participants have been assigned.

Imagine yourself in an experiment and being told that the pill you're taking for 8 weeks will stop your headaches. Can you see how it's critical that you, as a participant, and possibly the experimenter who collects your data, should be blind as to whether you are in the control or experimental group? In this example, that means if you were a participant you wouldn't know if you are being given the actual, experimental drug or a harmless, **placebo** pill that has no physiological effect. Researchers do this because your expectations or beliefs, rather than the experimental treatment, can produce a particular outcome, called a **placebo effect**. Giving members of the control group a placebo, while giving the experimental group a pill with the active ingredients, allows researchers to determine whether changes are due to the pill that's being tested, or simply to the participants' expectations.

Research Methods—Final Take Home Message

Recognizing that we've offered a large number of research problems and safeguards associated with the various research methods (descriptive,

Ethnocentrism   The belief that one's culture is typical of all cultures; also, viewing one's own ethnic group (or culture) as central and "correct" and judging others according to this standard.

Participant Bias   Bias that can occur when experimental conditions influence the participant's behavior or mental processes.

Single-Blind Study   An experiment where only the researcher, and not the participants, knows who is in either the experimental or control group.

Double-Blind Study   An experimental technique in which both the researcher and the participants are unaware of (blind to) who is in the experimental or control groups.

Placebo   An inactive substance or fake treatment used as a control technique, usually in drug research, or given by a medical practitioner to a patient.

Placebo Effect   A change that occurs when participant's expectations or beliefs, rather than the actual drug or treatment, cause a particular experimental outcome.

Figure 1.12 A single- or double-blind experimental design   To test a new drug, researchers administering the experimental drug and/or the participants taking the drug must be unaware of (or "blind" to) who is receiving a *placebo* (a fake pill) and who is receiving the drug itself. Placebos are necessary because researchers know that a participant's beliefs and expectations can change their responses and the experimental outcome, the so-called "placebo effect" (Brown, 2013; Draganich & Erdal, 2014).

Participant   **Experimenter**

Single-blind procedure
Only the experimenter knows who is in the experimental group versus the control group.

Double-blind procedure
Neither the experimenter nor the participants know who is in which group.
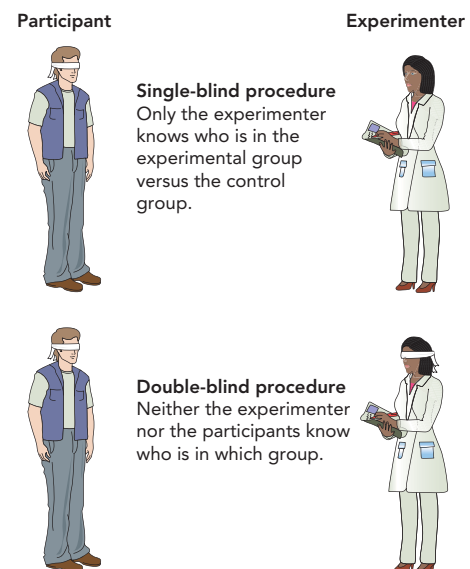
Figure 1.13 Potential research problems and solutions

Researcher		Participants	
Potential problem	**Potential problem**	**Potential problem**	**Potential problem**
Experimenter bias	Ethnocentrism	Sample bias and confounding variables	Participant bias
Solution	**Solution**	**Solution**	**Solution**
Blind observers, single- and double-blind studies, placebos	Cross-cultural sampling	Representative sampling, random assignment, rigorous experimental controls	Anonymity, confidentiality, placebos, single- and double-blind studies, deception

correlational, and experimental), we've gathered them all into **Figure 1.13**. Be sure to study it carefully. In addition, note that the problems and safeguards connected with descriptive and correlational research described earlier also apply to experimental research.

Before closing this section on research methods, we want to clarify that although experiments are considered the "gold standard" in research, descriptive and correlational methods also offer unique information that can help us live safer and more productive lives. For example, psychologists have repeatedly found high correlations between stress and disease (Chapter 3) and between cocaine use and heart attacks (Chapter 5). Can you see how we could never logistically or morally create controlled experiments, using human participants, that would prove true cause and effect in these situations? Instead, we often have to rely on the accumulating weight of the evidence from nonexperimental studies. It's also important to note that many researchers combine experiments with descriptive and/or correlational research.

If you'd like additional information about research methods and statistical analyses, see Appendix A at the back of this text. Note also that each chapter of this text offers an in-depth analysis of a hot topic in research (*Research Challenge*), along with it's own, built-in, self-grading quiz (*Test Yourself*). Check out the first example on the next page.

Ethical Guidelines

So far, we've discussed how psychologists conduct research and analyze their data. Now we need to examine the general ethics that guide their research. The two largest professional organizations of psychologists, the American Psychological Association (APA) and the Association for Psychological Science (APS), both recognize the importance of maintaining high ethical standards in research, therapy, and all other areas of professional psychology. The preamble to the APA's publication *Ethical Principles of Psychologists and Code of Conduct* (2002, 2010) requires psychologists to maintain their competence, to retain objectivity in applying their skills, and to preserve the dignity and best interests of their clients, colleagues, students, research participants, and society.

Respecting the Rights of Human Participants

The APA and APS have developed rigorous guidelines regulating research with human participants, including:

Informed Consent A participant's agreement to take part in a study after being told what to expect.

• **Informed consent** Researchers must obtain an **informed consent** agreement from all participants *before* initiating an experiment. Participants are made aware of the nature of the study, what to expect, and significant factors that might influence

RESEARCH CHALLENGE

Politics and Dating Relationships

Are you more likely to date a person if his or her political preference (conservative, moderate, liberal, or none) matches your own? To scientifically test this question, participants were brought into a research lab and shown profiles of fictional people, adjusted to look like those on popular online dating websites. However, these profiles were manipulated in several areas, including religion, education, and political preference (Huber & Malhotra, 2012).

The researchers were somewhat surprised that compatibility in political views significantly affected how much participants stated they would like to date someone. But they were even more surprised to find that participants also rated the fictional person as more physically attractive when they believed they shared similar political beliefs!

To see whether this artificial laboratory study would accurately predict behavior in a real-life situation, the researchers then conducted a second study, using data from an existing dating website called *OkCupid*. Given that online messages sent from one person and replied to by another generally indicate a shared interest in dating, the researchers reported that shared political views increased interest by 9.5%.

Why is this research important? *Similarity* is one of the best predictors of satisfaction in long-term relationships (Chapter 16). But what happens if we restrict our dating (and friendship) partners to those we already agree with? Aren't we more likely to fall victim to *groupthink* (Chapter 16) and *confirmation bias* (Chapter 8)?

Test Yourself

1. Based on the information provided, did these two studies (Huber & Malhotra, 2012) use descriptive, correlational, and/or experimental research? (Tip: Be sure to look for two separate answers for the two different studies.)

2. If you chose:

   • descriptive research, is this a naturalistic observation, survey, case study, or archival research?

   • correlational research, is this a positive, negative, or zero correlation?

   • experimental research, label the IV, DV, experimental group(s), and control group.

Check Your Answers in Appendix B.

Note: The information provided in this study is admittedly limited, but the level of detail is similar to what is presented in most textbooks and public reports of research findings. Answering these questions, and then comparing your answers to those in the Appendix, will help you become a better critical thinker and consumer of scientific research.

TEST YOURSELF

Becoming a Better Consumer of Scientific Research

The news media, advertisers, politicians, teachers, close friends, and other individuals frequently use research findings in their attempts to change your attitudes and behavior. How can you tell whether their information is accurate and worthwhile? The previous discussion of psychological research methods will help you identify the primary problem with each of the following sample research reports:

• CC = Report is misleading because correlation data are used to suggest causation.

• CG = Report is inconclusive because there was no control group.

• EB = Results of the research were unfairly influenced by experimenter bias.

• SB = Results of the research are questionable because of sample bias.

_____ 1. A clinical psychologist strongly believes that touching is an important adjunct to successful therapy. For two months, he touches half his patients (group A) and refrains from touching the other half (group B). He then reports a noticeable improvement in group A.

_____ 2. A newspaper reports that violent crime corresponds to phases of the moon. The reporter concludes that the gravitational pull of the moon controls human behavior.

_____ 3. A researcher interested in women's attitudes toward premarital sex sends out a lengthy survey to subscribers of *Vogue* and *Cosmopolitan* magazines.

_____ 4. An experimenter is interested in studying the effects of alcohol on driving ability. Before being tested on an experimental driving course, group A consumes 2 ounces of alcohol, group B consumes 4 ounces of alcohol, and group C consumes 6 ounces of alcohol. After the test drive, the researcher reports that alcohol consumption adversely affects driving ability.

_____ 5. After reading a scientific journal that reports higher divorce rates among couples living together before marriage, a college student decides to move out of the apartment she shares with her boyfriend.

_____ 6. A theater owner reports increased beverage sales following the brief flashing of a subliminal message to "Drink Coca-Cola" during the film showing.

Answers: 1. EB; 2. CC; 3. SB; 4. CG; 5. CC; 6. CG