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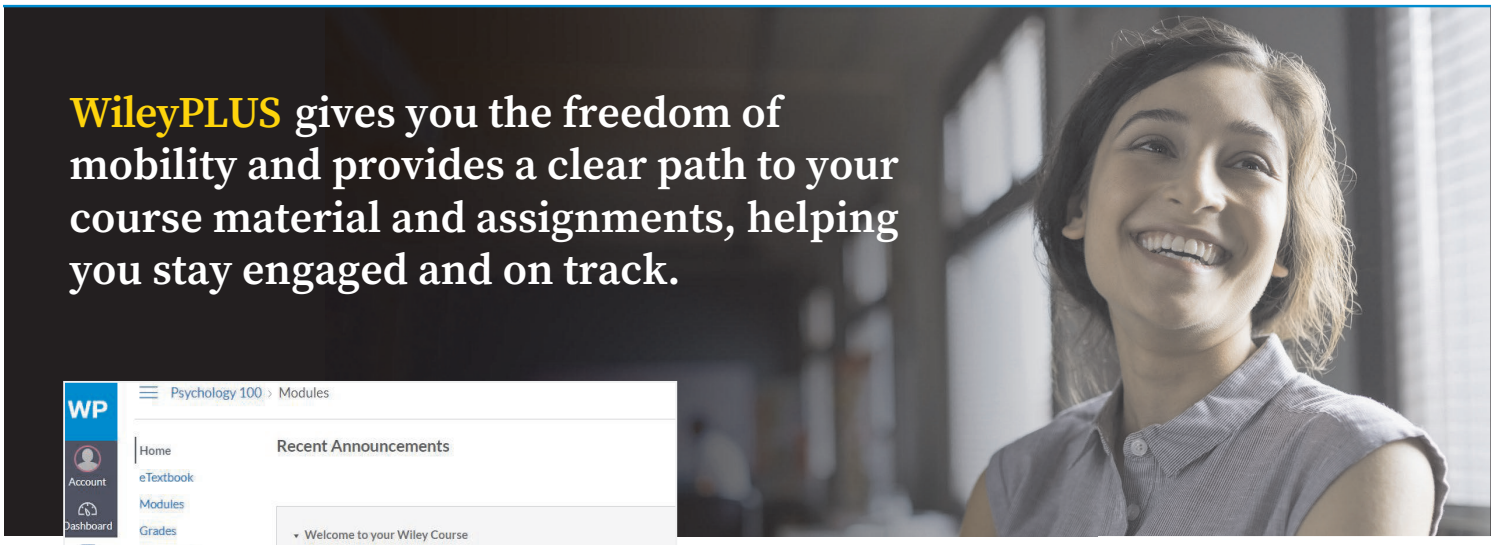

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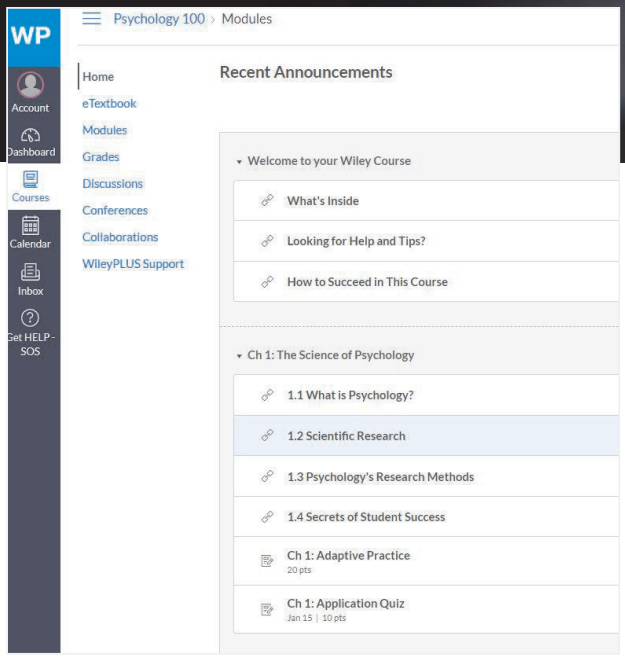

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Real World Psychology

Third Edition

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Amherst College

KAREN HUFFMAN
Palomar College

WILEY

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What's New in *Real World Psychology*, Third Edition?

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Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world. —Louis Pasteur

NEW THEME: *Scientific Thinking and Practical Applications*

Why did we choose this particular theme for our third edition? Introductory psychology is a fascinating and popular college class, but most students taking this course will not go on to be psychology majors. However, what they learn in the course, combined with our emphasis on scientific thinking and practical applications, will have an impact in other ways. As you can see in the photo above and the quote by Pasteur, we believe that our current global climate crisis is the single most important issue of our time—there simply is "No Planet B!" However, there are still some who believe "climate change is not real or is a hoax," "the science around climate change is not settled," or "humans are not the main contributors to climate change." They maintain these beliefs despite overwhelming evidence to the contrary. For example, multiple studies published in peer-reviewed scientific journals clearly show that 97 percent or more of actively publishing climate scientists agree that humans are the dominant cause of today's climate change.

Given the urgent need for consensus and action on the climate crisis, increasing global political divisions and racial tensions, poverty, income inequality, and other pressing problems, we thought we might help students to influence positive change by emphasizing the importance of scientific thinking and practical applications throughout this edition. We also believe that scientific thinking, combined with the ability to apply psychological science principles to our everyday life, are key to student understanding and personal success—not only in this introductory psychology course, but also in simply getting along well in life.

General Changes

The changes in this edition center around aligning our features to our new theme, as well as our ongoing desire to maintain currency and refine our content. The following outlines these general changes.

NEW and Revised Core Features

To reflect our theme, **Scientific Thinking** and **Practical Applications**, along with our increased focus on **APA Goals** for the undergraduate psychology major (which was discussed earlier in this preface), we added three NEW features to each chapter and revised two other continuing features. All of these features are highlighted in the outline at the beginning of each chapter. They are:

- NEW STH **Scientific Thinking Highlight** (APA GOAL 2.1)
- NEW PAH **Practical Application Highlight** (APA GOAL 1.3)
- NEW GCD **Gender** and **Cultural Diversity** (APA GOAL 2.5)
- REVISED and updated previous PsychScience feature, which is now RC **Scientific Thinking/Research Challenge** (APA GOAL 2.4)
- REVISED and updated previous PositivePsych feature, which is now PP **Practical Application/PositivePsych** (APA GOAL 1.3)

Other Changes

The most *significant general changes* that we incorporated throughout this edition include:

- Each chapter contains one or more NEW sections, called PAN **Practical Applications of Neuroscience**, which focus on high interest topics in neuroscience and their real world applications.
- Over **1,200 new research citations**; a fresh design and layout; and numerous new photos, figures, and tables.
- Several chapter reorganizations have been made, the most important of which is the inclusion of the updated chapter on gender and human sexuality in the main text (Chapter 10).
- Many new **Real World Application Questions [AQ1–AQ6]** have been added to the chapter opener and to each section's Learning Objectives. The answers to these questions are then embedded within the chapter content and identified by special icons **[AQ1-AQ6]**.
- Learning objectives for each chapter have been updated and expanded.
- Each chapter has one or more unique study tips, identified with this icon TIP, which clarify difficult or particularly confusing terms and concepts.
- To enhance readability and highlight our new theme, we updated and revised the previous *Psychology and You* and *Real World Psychology* boxes, and embedded them within the text with these two titles: S&P **Scientific Thinking/Practical Application** and PA **Practical Application/Test Yourself**.
- We added several NEW key terms and updated or fine-tuned several previous definitions.
- We expanded details within each of the end-of-chapter narrative summaries.

Specific Changes

Following, you will find a listing of the specific content changes for each chapter of *Real World Psychology*, Third Edition.

Chapter	New Research	New and Revised Features	Other Updates
Chapter 1 The Science of Psychology (new title)	• scientific thinking, ethnicity and job interviews, strength training and depression, co-sleeping with pets, psychology's replication crisis, quasi-experimental design, strategies for student success	• PP What Makes Us Happy? • GCD Biopsychosocial Forces and Acculturative Stress • STH Psychology and the Replication Crisis • RC Is Happiness Defined by Your Social Class? • PAH Tips for Grade Improvement • PAN Why Are Genes Important to Psychologists?	• 9 new key terms: confounding variable, demand characteristic, functionalism, random sample, replicate, scientific attitude, scientific thinking, structuralism, variable • new or revised: 8 figures, 3 photos, 2 process diagrams, 1 table
Chapter 2 Neuroscience and Biological Foundations	• effect of exercise on memory, oxytocin, dMRI new brain imaging, executive functions, athletes and traumatic brain injuries, dangers of high-fat foods	• PP How Does Positivity Affect Your Brain? • STH Can Neuroscience Help Kids (and Adults) Make Better Choices? • RC Phineas Gage—Myths versus Facts • PAH Can You Use Your Frontal Lobes to Train Your Brain? • PAN Stem Cell Transplants and Spinal Cord Injuries	• 1 new key term: executive functions (EFs) • new or revised: 4 figures, 2 process diagrams, 1 table
Chapter 3 Stress and Health Psychology	• social media and stress, chronic pain, social integration, placebos and personality differences, mindfulness-meditation, job stressors and acute/chronic stress	• PP Mindfulness and Your GPA • PAH Helping Someone with PTSD • RC Exercise, Mental Health, and Team Sports • GCD Can Job Stress be Fatal? • PAN Stress and Cortisol Effects on Memory	• 1 new key term: chronic pain • new or revised: 2 figures, 1 Test Yourself
Chapter 4 Sensation and Perception	• global increase in myopia, kangaroo care, priming and its effects on trust, depth perception taste preferences for cannabis users, how helmets increase risky behaviors	• PP Can Bouncing a Baby Increase Helping Behaviors? • PAH Why Do So Many People Believe in ESP? • RC Perceptual Set, Patients' Race, and Quality of Medical Care • GCD Are the Gestalt Laws Universally True? • STH Can Your Astrological Sign Predict Crime? • PAN Practical Importance of Rods and Cones Sensitivity • PAN Why Taste and Smell Receptors are Continually Replaced	• new or revised: 4 figures and 1 table
Chapter 5 States of Consciousness	• inattentional blindness, "catching up" on sleep, benefits of caffeine, repair and restoration theory of sleep, Facebook's efforts to increase addiction, sexsomnia (sleep sex), meditation and pain relief, marijuana's effects on cognitive functions	• GCD Dream Similarities and Variations • STH The Dangers of Distraction • PP Can Meditation Increase Helping Behaviors? • PAH Hidden Costs of Addiction • RC Can Alcohol Improve Your Foreign Language Skills? • PAN Why Teens Need More Sleep	• new or revised: 3 figures, 1 table, 1 Test Yourself

Chapter	New Research	New and Revised Features	Other Updates
Chapter 6 Learning	• positive images and relationship satisfaction, emotional eating, taxes on soda consumption, mirror neurons, taste aversion, enriched environments and older adults, generalization and relationship satisfaction, human cognitive maps	• GCD Learning, Scaffolding, and Culture • STH Wealth, Affirmative Action, and College Admission • PP The Impressive Powers of Prosocial Media • PAH Using Reinforcement and Punishment Effectively • RC Should You Use Food or Praise to Train Your Dog? • PAN Mirror Neurons and Learning	• new or revised: 5 figures, 2 cartoons, 1 table, 1 Test Yourself, 1 process diagram
Chapter 7 Memory	• how phones affect memory, physical fitness and dementia, parallel distributed processing (PDP), difference between Alzheimer disease (AD) and dementia, eyewitness testimony and police lineups, negative effects of smartphones, false memories	• STH Why False versus Repressed Memories Matter • GCD Can Culture Affect Our Memories? • PP Memory and Age-Related Happiness • PAH Tips for Memory Improvement • RC Can Taking Photos Impair Our Memories? • PAN Diagnosing and Preventing Alzheimer's Disease (AD)	• 2 new key terms: parallel-distributing processing (PDP) model, repression • new or revised: 7 figures, cartoons, 1 process diagram
Chapter 8 Thinking, Language, and Intelligence	• phone effects on problem solving, sexual attractiveness and creativity, identifying fake news, effects of brain size, artificial intelligence, genetic effects on educational attainment, cognitive offloading, divergent and convergent thinking, mind-wandering and creativity, extremes in intelligence	• PAH Tips for Improved Problem Solving • STH Should We Teach EI in Schools? • GCD Can Your Nonverbal Language Reveal Your Roots? • PP Why Talk or Read to Babies? • RC Is Creativity Linked with Psychological Disorders? • PAN Why Can't We Ignore a Crying Baby?	• 3 new key terms: artificial intelligence (AI), cognitive offloading • new or revised: 5 figures, 2 photos, 1 process diagram
Chapter 9 Development	• transmission of parents' early emotional trauma to unborn child, differences in teen brain, foreign travel effects on morality, "good touch" versus "bad touch," theory of mind (ToM)	• STH Vaccination and Herd Immunity • GCD Should Diversity Affect Research? • PAH Aging—It's Mostly Good News • PP Adults Need Hugs Too • RC Deprivation and Development • GCD Can Diversity Affect Moral Development? • PAN Puberty's Effects on Teen Sleep Pattern	• deleted section on sex and gender influences (moved to the NEW Chapter 10) • 5 new key terms: age-related positivity effect, autism spectrum disorder (ASD), herd immunity, morality, theory of mind (ToM) • new: 4 figures, 1 cartoon

Chapter	New Research	New and Revised Features	Other Updates
Chapter 10 Sex, Gender, and Sexuality (formerly an optional chapter, now part of the core content)	• AI voice assistants and gender-role stereotypes, myths of "stranger danger," normal variations in biological sex and gender, gender roles and sexual problems, assertiveness, sexual assault and harassment, rape myths	• PAH Preventing Sexual Violence • STH Can Political Affiliation Predict Sexual Behavior? • GCD Sexuality Across Cultures • PP Can Good Moods Lead to Safer Sex? • RC Why Do Men and Women Lie About Sex? • PAN Biology and Sexual Orientation	• 13 new key terms: double standard, excitement phase, gender expression, intersex, orgasm phase, pair bonding, plateau phase, resolution phase, sexual assault, sexual harassment, sexual response cycle, sexuality, sexually transmitted infections (STIs) • new or revised: 3 figures, 1 table
Chapter 11 Motivation and Emotion	• arousal effects on performance, social media and eating disorders, brain imaging and emotions, cognitive expectancies and alcohol consumption, rankings of America's happiness	• STH Do Losers Sometimes Actually Win? • GCD Does Your Smile Tell Others Where You're From? • PAH Five Tips for Increased Happiness • PP Can Long-Distance Relationships Survive? • RC Can Fake Smiling Lead to Heavy Drinking? • PAN How Can Some People Eat All They Want and Not Gain Weight?	• deleted the discussion of Sex and Motivation (moved to the NEW Chapter 10) • 1 new key term: display rules • new or revised: 3 figures, 2 tables, 2 Test Yourselves
Chapter 12 Personality	• cooperation and eating from a shared plate, using social media to measure personality, the FFM, vocational versus academic interests and the five-factor model (FFM), agreeableness and neuroticism and the FFM, myths of introversion and extraversion, parenting skills and marital satisfaction, travel effects on personality	• GCD Can Culture Affect Your Personality? • STH Could You Pass the Stanford Marshmallow Test? • PAH Can (and Should) We Improve Our Personality Traits? • PP Self-Efficacy in Daily Life • RC Do Non-Human Animals Have Unique Personalities? • PAN Neurochemistry Effects on Personality	• 4 new key terms: character, interactionism, situationism, temperament • new: 2 figures, 1 Test Yourself
Chapter 13 Psychological Disorders	• insanity defense in criminal trials, variations in psychological disorders around the world, myths, stigma, and mental illness, "trigger warnings" and anxiety disorders, mental health and electronic devices, biological factors and bipolar disorder, neurodevelopmental disorders, worldwide prevalence of schizophrenia, suicide, adverse childhood experiences (ACEs)	• GCD Avoiding Ethnocentrism? • STH Do We All Have ADHD? • PAH Myths, Stigma, and Discrimination in Mental Illness • PP Promoting Resilience in Children and Adults • RC Head Injuries and Depression • PAN Why has the usage of ADHD medication dramatically increased?	• 10 new key terms: adverse childhood experiences (ACEs), attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), avoidance learning, major depressive disorder (MDD), mania, neurodevelopmental disorder, nonsuicidal self-injury (NSSI), psychological disorder, psychology student syndrome (PSSS) • new: 8 figures, 4 tables
Chapter 14 Therapy	• accepting versus eliminating fears and PTSD, using modeling and imitation for phobias, dangers of media and itportrayals of suicide, ketamine as a treatment for depression, effectiveness of teletherapy, power of self-compassion	• GCD How Do Culture and Gender Affect Psychotherapy? • STH Do Psychedelic Drugs Lead to Psychosis? • PAH Tips for Finding a Therapist • PP Using Psychology to Promote Mental Health • RC Can Simple Self-Compassion Improve Your Mental and Physical Health? • PAN Why Lobotomies Gained Such a Bad Reputation	• 5 new key terms: evidence-based practice in psychology (EBPP), mindfulness-based cognitive therapy (MBCT), therapeutic alliance, token economy, transcranial direct current stimulation (tDCS) • new: 8 figures, 2 tables, 2 cartoons

Chapter	New Research	New and Revised Features	Other Updates
Chapter 15 Social Psychology	• Harry Potter and prejudice reduction, tips for great job interview, conformity and neighbor's conservation efforts, problems with Zimbardo's prison study, affirmative action, explicit and implicit attitudes and racism, conformity and who defied the majority in Asch's study, deindividuation, social facilitation, social loafing, how engaging in the arts increases cooperation and prosocial behavior	• STH Have Women Really "Come a Long Way, Baby"? • PAH What Are the Secrets to Enduring Love? • GCD How Does Culture Affect Our Personal Space? • PP Would You Donate a Kidney to a Stranger? • RC Can a 10-Minute Conversation Reduce Prejudice? • PAN Can Genetics Affect Our Political Attitudes?	• briefly explained the deletion of Zimbardo's prison study • 7 new key terms: assertiveness, compliance, dehumanization, person perception, self-fulfilling prophecy, social facilitation, social loafing • new: 8 figures, 5 photos, 1 cartoon, 1 table

Preface

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Have you ever wondered why certain images (like this chameleon) are chosen for the cover of a book? Given that many students come to their first psychology class with far too many misconceptions and limited notions about psychology, themselves, and human nature in general, our core mission is to demonstrate how psychological science can expand and change their minds, hearts, and views of the world around them. Therefore, we chose a chameleon as our "brand image" because of its well-known ability to change color, and for its 360-degree range of vision!

Why did we choose "Real World Psychology" as the title of our book? Although students may have numerous misconceptions about psychology, we know that most of them are truly interested in the field. However, in our fast-paced, modern society, they also face enormous pressures from their work, families, friends, and life in general. To capture and hold their attention, we cover all the essentials of psychology, while emphasizing "hot topics" based on fascinating scientific research with practical applications to their everyday lives, hence our title—*Real World Psychology!*

Dave Coverly/The Cartoonist Group

Thankfully, our readers seem to really enjoy our approach. Both students and professors have written emails and letters expressing how much they appreciate our writing style and how they feel like the book spoke directly to them. Two of their most frequent, and our most treasured, compliments were:

> "The real-life examples and FUN activities and visuals (see cartoon) in Real World Psychology made the material easy to understand and helped me apply the information to my personal situations."
>
> "It's clear that the authors really love their field and truly care about their readers."

As you can see, we feel passionate about our third edition and we're eager to hear from all instructors and students. If you have suggestions or comments, please feel free to contact us directly: Catherine Sanderson (casanderson@amherst.edu) and Karen Huffman (khuffman@palomar.edu).

Note to Instructors

Welcome to the third edition of *Real World Psychology*! If you are reading this, and have used one or more of our previous editions, or are considering an adoption for the first time, we want to offer our sincere appreciation. We've received emails and texts from many of you, and we're honored by the enthusiastic responses to our text.

In response to your questions, and the continuing challenges of teaching, we'll address three of the most common and pressing issues, and how we've addressed them in this third edition.

1. "How can using *Real World Psychology* increase active learning, student engagement, and motivation?"

Research clearly shows that active learning, student engagement and motivation are essential to student (and professor success). And, beginning with our first edition, these three items have always been our primary goal! As you'll see throughout the text, we've done everything we can to promote active learning and to engage and inspire our readers. For example:

- Each chapter begins with six, intriguing **[AQ]** *Application Questions* that are directly related to that chapter's specific content. Reviewer and student comments agree that they are a great way to grab student interest and motivation for reading the chapter's material. Special icons (e.g., **[AQ1]**) appear in the text to alert readers where answers to the questions are addressed. See the sample below.

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CHAPTER 1

The Science of Psychology

Real World Application Questions [AQ]

Things you'll learn in Chapter 1

[AQ1] Does your ethnicity affect the type of questions you're asked in a job interview?

[AQ2] Can strength training decrease depression?

[AQ3] Can a diet high in fats and sugars impair learning and memory?

[AQ4] Does spending more time on Instagram decrease your psychological well-being?

[AQ5] Is there a correlation between years of education and physical health?

[AQ6] What are the best study techniques for improving your exam performance?

Throughout the chapter, look for [AQ1]–[AQ6] icons. They indicate where the text addresses these questions.

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CHAPTER OUTLINE

1.1 What Is Psychology? 2
- Psychology and Scientific Thinking
- Psychology's Origins
- Modern Psychology

PP **Practical Application: PositivePsych**
What Makes Us Happy? (APA Goal 1.3)

- Careers and Specialties in Psychology

GCD **Gender and Cultural Diversity**
Biopsychosocial Forces and Acculturative Stress (APA Goal 2.5)

1.2 Scientific Research 12
- Psychology's Four Main Goals
- Basic and Applied Research
- The Scientific Method

STH **Scientific Thinking Highlight**
Psychology and the Replication Crisis (APA Goal 2.1)

- Psychology's Research Ethics

1.3 Psychology's Research Methods 20
- Descriptive Research
- Correlational Research
- Experimental Research
- General Research Problems and Safeguards

RC **Scientific Thinking: Research Challenge**
Is Happiness Defined by Your Social Class? (APA Goal 2.4)

1.4 Secrets of Student Success 31
- Study Habits
- Time Management

PAH **Practical Application Highlight**
Tips for Grade Improvement (APA Goal 1.3)

- Given the well-known student interest and motivation related to practical applications, as well as the increasing public demand for increased scientific thinking, we include four special features in each chapter dedicated to these two topics. See the samples below.

PP Practical Application: PositivePsych

What Makes Us Happy?

(APA Goal 1.3) Describe applications of psychology

One of the most consistent findings in positive psychology is that other people make us happy. "Simply" building and maintaining relationships tends to significantly improve our overall happiness and well-being (Diener & Tay, 2015; Galinha et al., 2016; Lee & Kawachi, 2019). As shown in the photo, even just talking with strangers leads to higher levels of happiness. Researchers who asked riders on trains and buses to either quietly sit alone or talk to a stranger found that those who talked to a stranger reported more positive feelings than those who sat alone (Epley & Schroeder, 2014).

In addition, contrary to the popular belief that "money buys happiness," research shows that once we have enough income to meet our basic needs, additional funds do not significantly increase our levels of happiness and well-being (Kushlev et al., 2015; Whillans & Macchia, 2019). Furthermore, 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).

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STH Scientific Thinking Highlight

Have Women Really "Come a Long Way, Baby"?

(APA Goal 2.1) Use scientific reasoning to interpret psychological phenomena

In the 1960s, when the feminist movement was gaining in strength and popularity, and attitudes toward women's rights were shifting, the Virginia Slims tobacco company attempted to capitalize on that change. Using their own form of cognitive retraining and classical conditioning (Chapter 6), they created clever ads that paired smoking their brand of cigarettes with being independent, stylish, confident, and liberated. Their campaign line, "You've come a long way, baby," remains one of the most famous in U.S. history (see photo).

But is this true? Women have definitely made considerable gains, including laws protecting them from domestic violence and laws providing family medical leave. There are also more women in the halls of political power than ever before. Yet they still have a long way to go before reaching equality with men. Consider the following examples based on recent research.

Within the United States:

- Given that men and women have different work histories, experiences, and career opportunities, it's difficult to pinpoint the exact pay gap between the sexes, but one common estimate is that for full-time, year-round workers, women still earn far less that their White male counterparts. Specifically, for every dollar earned by White men: Asian women earn $0.85, White women $0.77, Black women $0.61, Native American women $0.58, and Latina women $0.53 (AAUW, 2019; Graf et al., 2019; Hegewisch, 2019).
- Women who speak up in meetings, or during participation in the "wild," are much less likely to be considered leaders, even when the ideas they share are the same as a man's in the same setting (McClean et al., 2018).
- As discussed in Chapter 10, female attorneys who express anger in the courtroom are seen as shrill and obnoxious, whereas male attorneys who express similar anger are seen as powerful and full of conviction (Salerno et al., 2018).
- When asked to draw a scientist, a meta-analysis of 78 studies found that children are still far more likely to draw a man versus a woman, and the difference is the greatest among older children (Miller et al., 2018).

Around the world:

- The economic participation and opportunity gap between men and women is currently 41.9 percent among the 149 countries studied, and experts predict it will take more than a hundred years for this gap to close (The Global Gender Gap, 2018).
- Among these same 149 countries, only 17 currently have women as heads of state, and women hold only 34 percent of all managerial positions (The Global Gender Gap, 2018).
- Out of 15 countries, including the United States, women are at far greater risk of gender-based violence than men (Blum et al., 2017).

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Q Test Your Scientific Thinking

As you recall from Chapter 1, scientific thinking is an approach to information that combines a high degree of *skepticism* (questioning what "everybody knows") with *objectivity* (using empirical data to separate fantasy from reality) and with *rationalism* (practicing logical reasoning).

1. **Skepticism** Given the title and topic of the report cited at the beginning of this highlight "Have Women Really 'Come a Long Way, Baby'?" were you predisposed to believe or discount the information? Did the cited research change your attitudes? Why or why not?
2. **Objectivity** Imagine you are talking to someone who is a strong believer or denier of sexism within the United States and around the world. Using the objective research and statistics cited above, how could you use the information to have a meaningful conversation on these topics with these two individuals? How might this type of dialogue be helpful to both of you?
3. **Rationalism** Given the serious national and international challenges that we all face, solving these problems logically demands innovative engineering solutions (Roscoe et al., 2019), as well as the input of all people—regardless of gender, ethnicity, age, and so on. What can (and should) we do to correct this persistent sexism?

(Compare your answers with those of your fellow students, family, and friends. Doing so will improve your scientific thinking and your media savvy.)

PAH Practical Application Highlight

Tips for Grade Improvement

(APA Goal 1.3) Describe applications of psychology

In combination with the previous study habit and time management tips, the following strategies are virtually guaranteed to improve your overall grade point average (GPA) in all your college classes and your mastery of the material.

1. **Refuse to multitask on new or complex material.** Are you one of the many students who believe that doing more than one task at a time makes you more effective? If so, you'll be surprised to know that this so-called "multitasking" is actually just "task-switching," and that it clearly decreases overall performance and productivity—particularly for new or complex tasks (Aagaard, 2019; Bender et al., 2017; Ralph et al., 2019). As you discovered earlier in the section on active reading and the *Test Yourself* Stroop test, switching from one task to another (reading a word while trying to state its color) greatly increased your response time—and errors.

   Can you see how this explains why texting and driving (or walking) is so dangerous (Chapter 5), and how casually listening to the professor, while also texting, playing computer games, or talking to other classmates, is largely a waste of time? In fact, astudy in an introductory psychology class found that Internet use during lectures was *negatively correlated* with student performance, which means, as you learned earlier in this chapter, that as Internet usage went up performance went down (Ravizza et al., 2017). A good rule to remember is that one hour of full attention in class is generally worth about four hours on your own outside of class. In addition to paying full attention, taking detailed notes by hand versus a laptop during each class session is one of the most efficient and profitable uses of your time (Mueller & Oppenheimer, 2014).
2. **Maximize the value of each class session.** As you know, the authors of this text are both college professors, so this advice may sound biased. However, solid psychological research (e.g., Putnam et al., 2016) recommends that all students do the following:
   - **Prepare ahead of time.** Be sure to study the assigned material ahead of each class.
   - **Attend every class.** Most instructors provide unique ideas and personal examples that are not in the text, and even when they do repeat what is covered in the text, we all need to have multiple exposures to new material. Also, pay close attention to what your professor emphasizes in class, as this material is likely to appear on exams. Think of your professor's lecture as you would tips from your coach or an employer who was going out of his or her way to tell you what you needed to know to maximize your performance or paycheck.
3. **Improve your general test-taking skills.** Virtually all students can improve their performance on exams by taking additional courses designed to develop their reading speed and comprehension. During exams, expect a bit of stress but don't panic. Pace yourself and focus on what you know. Skip over questions when you don't know the answers, and then go back if time allows. On multiple-choice exams, carefully read each question and all the alternative answers, before responding. Answer all questions and make sure you have recorded your answers correctly.

   Also, bear in mind that information relevant to one question is often found in another test question. Do not hesitate to change an answer if you get more information—or even if you simply have a better guess about an answer. Contrary to the belief held by many students (and faculty) that "your first hunch is your best guess," research suggests this is NOT the case (Benjamin et al., 1984; Lilienfeld et al., 2010, 2015). Changing answers is far more likely to result in a higher score (**Figure 1.20**).

FIGURE 1.20 Should you change your answers? Research clearly shows that answer changes that go from a wrong to a right answer (57.8 percent) greatly outnumber those that go from a right to a wrong answer (20.2 percent).
Source: Benjamin et al., 1984.

4. **[AQ6] Distribute your practice and practice test taking.** Research has firmly established that these last two techniques—*distributed practice* and *practice testing*—are the MOST important keys to grade improvement—see photo (Carpenter & Yeung, 2017; Gagnon & Cormier, 2018; Trumbo et al., 2016). Why? Spreading your study sessions out over time (distributed practice) and practice testing are far more efficient than waiting until right before an exam and cramming in all the information at once (massed practice) (Chapter 7). If you were a basketball player, you wouldn't wait until the night before a big play-off game to practice. Just as you need to repeatedly practice your free throw shot to become a good basketball player, you need to repeatedly practice your test-taking to become a good student.

Olga_Danylenko/iStock/Getty Images

   Based on this growing body of research and our own teaching success with frequent testing, we've designed this text to include numerous, distributed practice opportunities sprinkled throughout each chapter. As you're actively reading and studying, be sure to complete all these self-tests. When you miss a question, it's very helpful, and important, to immediately go back and reread the sections of the text that correspond to your incorrect response. You can also easily access the free flashcards and other forms of self-testing provided with the purchase of this text.
5. **Adjust your attitude.** We've saved our best tip—*attitude adjustment*—for last. You have the power to decide that you can, and will, improve your academic skills. Instead of focusing on negative thoughts, such as "I can't go to the party because I have to study" or "Going to class feels like a waste of time," try counter statements, like "I'm going to learn how to study and make better use of my class time, so that I can have more free time." Similarly, rather than thinking or saying "I never do well on tests," do something constructive like taking a study skills and/or test preparation course at your college.

RC Scientific Thinking: Research Challenge

Is Happiness Defined by Your Social Class?

(APA Goal 2.4) Interpret, design, and conduct basic psychological research

Earlier in this chapter, we discussed research in positive psychology showing that once we have enough income to meet our basic needs, additional funds won't significantly increase our levels of happiness. In short, money doesn't buy happiness. However, now that you've studied the basics of psychological research and are applying your scientific and critical thinking skills, do you wonder how happiness was identified and defined? Researchers interested in the emotional components of happiness, and how these components might vary among people in different socioeconomic classes, recruited a large nationally representative U.S. sample of 1,519 individuals (Piff & Moskowitz, 2018). Participants were asked to self-report on their tendencies to experience seven different positive emotions that are core to happiness—amusement, awe, compassion, contentment, enthusiasm, love, and pride.

Can you predict their findings? Interestingly, wealthier participants (as measured by household income) were more likely to report *self-focused* emotions, such as amusement, contentment, and pride. Conversely, the lower social class participants reported more *other-oriented* emotions, like compassion and love. There were no class differences in enthusiasm.

How would you explain the results? The researchers suggested that the class differences may reflect varying social concerns and priorities of the higher versus lower social classes. The self-oriented feelings of the upper-class participants may result from their specific upbringing and desires for independence and self-sufficiency. In contrast, the other-oriented emotions of the lower-class may follow from growing up in more threatening environments, which possibly led to a greater desire for compassion, love, and more interdependent bonds. What do you think? Given that you may be attending college hoping to secure a high-paying job, how can you apply this research to your own career and relationship aspirations?

Identify the Research Method

1. Based on the information provided, did this study (Piff & Moskowitz, 2018) use descriptive, correlational, and/or experimental research?
2. If you chose:
   - *descriptive research*, is this a naturalistic or laboratory observation, survey/interview, case study, and/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. (Note: If participants were not randomly assigned to groups, list the design as *quasi-experimental*.)
   - both *descriptive* and *correlational*, answer the corresponding questions for both.

Check your answers by clicking on the answer button or by looking 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 provided, will help you become a better scientific and critical thinker and consumer of scientific research.

- Recognizing the growing interests and diversity of our students, we embed numerous examples of diversity throughout the text, along with more inclusive photos, figures, and tables. In addition, we have added a special, NEW feature **GCD Gender and Cultural Diversity** to each chapter, which expands on cultural issues related to that chapter's academic content. See the sample below.

GCD Gender and Cultural Diversity

Biopsychosocial Forces and Acculturative Stress

(APA Goal 2.5) Incorporate sociocultural factors in scientific inquiry

Have you ever lived in or dreamed of emigrating to another country? If so, you probably imagine yourself fully enjoying all the excitement and adventure. But have you considered the stress and stressors that come with adapting to and surviving in a new culture?

Courtesy of Linda Locklear

Courtesy of Linda Locklear

International travelers, military personnel, immigrants, refugees, individuals who move from one social class to another, and even the native-born may fall victim to the unspoken and unforeseen stressors of adjusting their personal and family values, their cultural norms, and maybe their style of dress to the new or dominant culture (like the young Native American woman in these two photos). These required adjustments are referred to as *acculturation*, whereas the associated stress is called *acculturative stress*.

Naturally, this type of stress places great demands on the individual's biological, psychological, and social well-being—the *biopsychosocial forces* (Berry et al., 1987; Corona et al., 2017; Zvolensky et al., 2016). However, the degree of acculturative stress depends in part on the method of coping an individual chooses when entering a new society. Researchers have identified four major approaches to acculturation (Berry & Ataca, 2010; Urzúa et al., 2017):

1. **Integration** As you might expect, a choice toward *integration* typically leads to the lowest levels of acculturative stress. People who have a high desire to maintain their original cultural identity, while also having a strong motivation to learn from and seek positive relations mainly with the new culture are pursuing the path to integration. However, stress will still be a factor if the person has been forced to emigrate, or if the new country is reluctant to accept newcomers and distrustful of ethnic and cultural diversity.
2. **Assimilation** People who choose to *assimilate* typically have a low identification with their culture of origin and a high desire to identify with the new culture. They tend to have the next lowest level of stress, but there are still many problems, presumably due to the loss of cultural support from other members of the original culture who do not assimilate.
3. **Separation** Individuals who choose to *separate* often place high value on their original culture and do not want to adapt to the new one. They generally have the next to highest level of acculturative stress, which is most likely due to being separated from the new or dominant culture. Their stress levels are even higher for those who are forcibly separated by prejudice and discrimination than for those who separate voluntarily.
4. **Marginalization** People who have a low identification with both the new culture and their culture of origin are likely to be *marginalized* from the dominant culture. This pattern normally leads to the highest levels of acculturative stress, presumably due to the fact that they tend to live on the "margins" and lack the connections and support of either the old or new cultures.

To check your understanding of these four patterns, see the following **Test Yourself**.

Q Test Yourself: Cultural Reactions to Stress

Picture yourself as a college graduate who's been offered a high-paying job that will allow you to move from a lower socioeconomic class to the middle or upper class. What you don't know is that your change in status will likely lead to considerable acculturative stress. In anticipation of this change, will you:

- **Adopt the *majority* culture and seek positive relations with the new or dominant culture?**
- **Maintain your original cultural identity and avoid relations with the dominant culture?**

Your responses to these two questions tend to place you into one of the four major approaches to acculturation—and will likely predict your level of stress.

SOPA Images Limited/Alamy Stock Photo

As an example of acculturative stress, consider Malala Yousafzai, the famous activist (see photo), who, at the age of 17, was the youngest person ever to win the Nobel Peace Prize. The path to this honor began when she was an 11-year-old writing a courageous blog describing her life under the Taliban and her desire for all girls to have the chance to be educated. Tragically, her courage led to her being shot in the head at the age of 15 by the Taliban as she was on her way to school. After surviving the attempted murder, Malala went on to become an international activist who's traveled all over the world. Malala also recently published a book describing her experiences visiting refugee camps and the tens of millions of people who are currently displaced (Yousafzai, 2019).

Although Malala and her family emigrated to the UK after the attack on her life, she plans to return to the home she loves in Pakistan after completing her education at Oxford University. Which of the four approaches to acculturation do you think she has followed while living in the UK?

Take-Home Message **Later in this chapter, we will introduce the topic of *ethnocentrism*, believing that one's culture is typical of all cultures and/or that one's own culture is the "correct" one. Can you see how ethnocentrism would logically increase acculturative stress if you decide to relocate or even just when you're traveling? Perhaps the most important question is how can we as individuals and citizens of the world help reduce the anxiety, depression, alienation, and physical illnesses associated with forced and voluntary emigration, and the inevitable acculturative stress?**

2. "Our administrators are pressing for better retention, accountability, and improved learning outcomes, how does *Real World Psychology* meet those demands?"

As you'll note throughout the text, and in the upcoming section describing all our teaching and learning resources, we the authors, along with all the hard-working specialists at Wiley, have strived to ensure better retention, accountability, and improved learning outcomes. In addition, see the following information, including Table 1, which demonstrate how our text meets the national standards set by the American Psychological Association (APA).

Real World Psychology's Connections to APA Undergraduate Learning Goals and Outcomes

"The *APA Guidelines for the Undergraduate Psychology Major: Version 2.0* represents a national effort to describe and develop high-quality undergraduate programs in psychology." APA Guidelines Executive Summary, August 2013. Retrieved from http://www.apa.org/ed/precollege/about/psymajor-guidelines.pdf

Table 1 demonstrates how the third edition of *Real World Psychology* connects directly with the APA guidelines to help instructors and their students meet the five goals set forward by the APA.

TABLE 1 **APA Guidelines and Related Coverage in *Real World Psychology*, 3rd ed. [RWP(3e)]**

Goal 1. Knowledge Base in Psychology

APA Learning Objectives:

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

PAH **Practical Application Highlight**—NEW feature in RWP(3e). Includes topics such as Secrets of Student Success, Tips for Improved Problem Solving, Self-Efficacy in Daily Life, Myths, Stigma, and Discrimination in Mental Illness, and What Are the Secrets to Enduring Love?

PP **Practical Application: PositivePsych**—NEW feature in RWP(3e). Includes topics such as, What Makes Us Happy?, Promoting Resilience, Why Talk or Read to Babies?, and Would You Donate a Kidney to a Stranger?

Real World Psychology offers full coverage of the knowledge base in psychology, including all the major subject areas in psychology: history and research methods, biological psychology, stress and health psychology, sensation and perception, and so on. We also offer comprehensive, up-to-date psychological research in each chapter (over 1,000 new citations). Regarding practical applications, we provide TWO NEW special features in each chapter (see the descriptions of the PAH and PP in left column), along with numerous embedded applications throughout the text. As our title implies, *Real World Psychology* focuses on applications to our everyday life and *real world* examples.

The knowledge base in psychology is also emphasized in the Instructor's Resource Guide, WileyPlus, and other Wiley website assets that can be found at **www.wiley.com/college/sanderson**, and more.

Goal 2. Scientific Inquiry and Critical Thinking

APA Learning Objectives:

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

STH **Scientific Thinking Highlight**—NEW feature in RWP(3e). Includes topics such as Psychology and the Replication Crisis, Do We All Have ADHD?, Vaccination and Herd Immunity, and Have Women Really "Come a Long Way, Baby"?

RC **Scientific Thinking: Research Challenge**—NEW feature in RWP(3e). Includes topics such as Does Retrieval Practice Help?, Can Head Injuries Increase the Risk for Depression and Other Psychological Disorders?, and Can a 10-Minute Conversation Reduce Prejudice?

Throughout the entire text, *Real World Psychology* emphasizes the importance of scientific inquiry and critical thinking. Along with the TWO NEW special features focusing on scientific thinking, the STH and RC, we also include a special embedded (non-boxed) feature— S&P **Scientific Thinking and Practical Application**—which focuses on critical topics and questions, such as Science Versus Pseudoscience, Is Schizophrenia the Same as Multiple Personalities?, and Can Gender Differences Lead to Differential Diagnoses?

In addition, each chapter begins with six Application Questions [AQ1-AQ6] designed to immediately engage the reader, with answers embedded throughout the chapter (e.g., Does spending more time on Instagram decrease your psychological well-being? Does your ethnicity affect the type of questions you're asked in a job interview? Can reading *Harry Potter* books increase positivity towards gay people?)

2.5 Incorporate sociocultural factors in scientific inquiry

Regarding sociocultural factors, in addition to comprehensive coverage throughout, we also offer a GCD **Gender and Cultural Diversity**—NEW feature in RWP(3e). Includes topics such as Biopsychosocial Forces and Acculturative Stress, Avoiding Ethnocentrism, and How Does Culture Affect Our Personal Space?

Scientific inquiry and critical thinking are also highlighted in the Instructor's Resource Guide, WileyPlus, and other Wiley website assets that can be found at **www.wiley.com/college/sanderson**, and more.

Goal 3. Ethical and Social Responsibility in a Diverse World

APA Learning Objectives:

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

Throughout the entire text, *Real World Psychology* highlights ethical and social responsibility, such as Psychology's Research Ethics (Chapter 1), Can Growing Up in Poverty Cause Changes in Your Brain? (Chapter 3), Patients' Race and Quality of Medical Care (Chapter 4), i Can Meditation Increase Helping Behaviors? (Chapter 5), Can Diversity Affect Moral Development? (Chapter 9), Preventing Sexual Violence (Chapter 10), What Parenting Skills Are Associated with Marital Satisfaction? (Chapter 12), Avoiding Ethnocentrism (Chapter 13), and Promoting Resilience in Children and Adults (Chapter 13).

Ethical and social responsibility is also emphasized in the Instructor's Resource Guide, WileyPlus, and other Wiley website assets that can be found at **www.wiley.com/college/sanderson**, and more.

Goal 4. Communication

APA Learning Objectives:

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

Each chapter of *Real World Psychology* affirms the importance of communication with special topics and sections such as Helping Someone with PTSD (Chapter 3), Can Maximizing Your Conscientiousness Save Lives? (Chapter 5), Using Reinforcement and Punishment Effectively (Chapter 6), The Impressive Powers of Prosocial Media (Chapter 6), Negative Effects of Smartphones (Chapter 7), Understanding Verbal and Nonverbal Language (Chapter 8), Differentiating Fake News from Real News (Chapter 8), Sexual Communication (Chapter 10), Conflict Resolution (Chapter 10), Tips for Finding a Therapist (Chapter 14), Can a 10-Minute Conversation Reduce Prejudice (Chapter 15)?

Communication is also a key feature in the Instructor's Resource Guide, WileyPlus, and other Wiley website assets that can be found at **www.wiley.com/college/sanderson**, and more.

Goal 5. Professional Development

APA Learning Objectives:

5.1 Apply psychological content and skills to career goals
5.2 Exhibit self-efficacy and self-regulation
5.3 Refine project management skills

Throughout the entire text, *Real World Psychology* emphasizes professional development with special topics and sections such as Where Psychologists Work and What Psychologists Do (Chapter 1), Using your Frontal Lobes to Train Your Brain (Chapter 2), Coping with Job Stress and Technostress (Chapter 3), Vocational ver-sus Academic Interests and the FFM (Chapter 12), Self-Efficacy in Daily Life (Chapter 13), and Tips for a Great Interview (Chapter 15).

Professional development is also highlighted in the Instructor's Resource Guide, WileyPlus, and other Wiley website assets that can be found at **www.wiley.com/college/sanderson**, and more.

3. "I want my students to come to class better prepared and able to perform better on exams. How can *Real World Psychology* help me?"

Real World Psychology, Third Edition, is completely integrated with WileyPLUS, featuring a suite of teaching and learning resources. With WileyPLUS, you can provide students with a personalized study plan that gives access to the content and resources needed to master the material, and assess their progress along the way. WileyPLUS provides an immediate understanding of students' strengths and problem areas with reports and metrics that provide insight into each student's performance, allowing you to identify and address individual needs in a timely manner. Many dynamic resources are integrated into the course to help students build their knowledge and understanding, stay motivated, and prepare for decision making in a real world context.

WileyPLUS also includes integrated adaptive practice that helps students build proficiency and use their study time most effectively. Additional features of the WileyPLUS course include:

For Each Learning Objective

- **What the Authors Say** videos, featuring Catherine Sanderson and Karen Huffman, provide a lively discussion, introducing key terms and concepts to give students a better understanding of the topic they are about to study.
- **In the Classroom** videos show author Catherine Sanderson illustrating the concepts presented in the chapter section with an example. In many cases, a Student Voices segment is also featured, showing a student discussion group.

Throughout the Course

- More than 40 **Wiley Psychology Animations** illustrate difficult-to-learn concepts from a real world perspective.
- More than 30 **Tutorial Videos**, featuring author Karen Huffman and Katherine Dowdell of Des Moines Area Community College, 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 psychology 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 20 **Visual Drag-and-Drop and Interactive Graphics** provide students with a different, and more interactive, way to visualize and label key illustrations from the text.

Practice and Assessment

WileyPLUS features adaptive practice, video quizzes, and more. Two highlights of the practice and assessment content in this edition are:

- With approximately 150 questions per chapter, the Test Bank is available in two modes. Word file is available for review in the Instructor Resources. In addition, all questions have been programmed for WileyPLUS, where they can now be filtered by APA standards, as well as learning objective, section, Bloom's level, and level of difficulty for use in custom assignments. A carefully designed assignment using these questions, a Quick Start Text Bank Assignment, is also provided. This gathers the most popular questions from the prior edition, based on user data from WileyPLUS.
- A specific, ready-made assignment is also now available with all new Application questions. In keeping with the theme of this revision, these questions ask students to use the knowledge they have acquired in an applied setting.

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Authors' Personal Notes

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Kuttelvaserova Stuchelova/Shutterstock.com

CHAPTER 1

The Science of Psychology

Sunshine Seeds/Shutterstock.com

Real World Application Questions [AQ]

Things you'll learn in Chapter 1

[AQ1] Does your ethnicity affect the type of questions you're asked in a job interview?

[AQ2] Can strength training decrease depression?

[AQ3] Can a diet high in fats and sugars impair learning and memory?

[AQ4] Does spending more time on Instagram decrease your psychological well-being?

[AQ5] Is there a correlation between years of education and physical health?

[AQ6] What are the best study techniques for improving your exam performance?

Throughout the chapter, look for [AQ1]–[AQ6] icons. They indicate where the text addresses these questions.

CHAPTER OUTLINE

1.1 What Is Psychology? 2

- Psychology and Scientific Thinking
- Psychology's Origins
- Modern Psychology

PP **Practical Application: PositivePsych**
What Makes Us Happy? (APA Goal 1.3)

- Careers and Specialties in Psychology

GCD **Gender and Cultural Diversity**
Biopsychosocial Forces and Acculturative Stress (APA Goal 2.5)

1.2 Scientific Research 12

- Psychology's Four Main Goals
- Basic and Applied Research
- The Scientific Method

STH **Scientific Thinking Highlight**
Psychology and the Replication Crisis (APA Goal 2.1)

- Psychology's Research Ethics

1.3 Psychology's Research Methods 20

- Descriptive Research
- Correlational Research
- Experimental Research
- General Research Problems and Safeguards

RC **Scientific Thinking: Research Challenge**
Is Happiness Defined by Your Social Class? (APA Goal 2.4)

1.4 Secrets of Student Success 31

- Study Habits
- Time Management

PAH **Practical Application Highlight**
Tips for Grade Improvement (APA Goal 1.3)

1.1 What Is Psychology?

LEARNING OBJECTIVES

Retrieval Practice While reading the upcoming sections, respond to each Learning Objective in your own words.

Summarize psychology, its past and present.

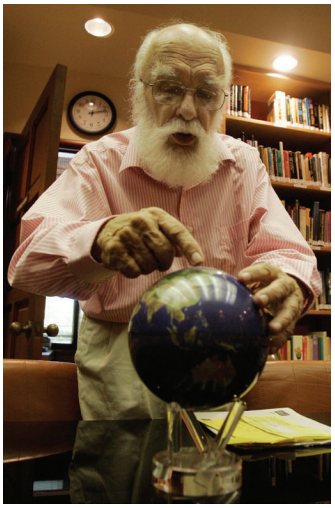
- **Define** psychology, pseudoscience, and scientific thinking.
- **Review** structuralism, functionalism, and the psychoanalytic perspectives.
- **Discuss** modern psychology's seven major perspectives, the contributions of women and people of color, and the biopsychosocial model.
- **Summarize** psychology's major career options and specialties.

Real World Application Question

[AQ1] Does your ethnicity affect the type of questions you're asked in a job interview?

Psychology The scientific study of behavior and mental processes.

Welcome to **Real World Psychology!** As our title suggests, we believe psychology's unique contributions to the scientific world are best shown through every day, real-life examples. Given that this first chapter is an overview of the entire field of psychology, we begin with a formal definition of psychology, followed by its brief history as a scientific discipline. Then, we explore the basics of science, the scientific method, and how psychologists apply them when conducting research. We close with a section on Secrets of Student Success based on psychological science that will help you master the material in this and all your other college textbooks and courses.



AP Images/Alan Diaz

Magic versus pseudoscience The magician James Randi has dedicated his life and his skills as a magician to educating the public about fraudulent paranormal, psychic, and pseudoscientific claims. Although his foundation offered a prize of $1 million for many years to "anyone who proves a genuine psychic power under proper observing conditions," the money was never collected (Randi, 2014; The Amazing Meeting, 2011). For more information, check out https://web.randi.org/home/jref-status

Psychology and Scientific Thinking

What is **psychology**? The term 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. *Behaviors* (crying, hitting, sleeping) are also emphasized because they can be directly observed and measured. Although *mental processes* cannot be directly observed (feelings, thoughts, memories), they can be studied scientifically. Keep in mind that psychology encompasses humankind as well as our non-human compatriots—from rats and pigeons to cats and chimps.

Psychology versus Pseudoscience

Why is the scientific foundation so important in psychology? Since ancient times, people have always been interested in the fascinating topics we study in psychology. Unfortunately, psychological science is often confused with faulty, non-scientific claims of psychic powers, horoscopes, mediums, and "pop psych" statements such as "I'm mostly right brained" or "We use only ten percent of our brains."

For many people, reading their horoscope or going to a palmist to have their fortunes told may be simple entertainment. However, fervent believers have been known to waste large sums of money on charlatans purporting to know the future or to speak with their deceased relatives (e.g., M. Wilson, 2015). Broken-hearted families have also lost valuable time, money, and emotional energy on psychics claiming they could locate their missing children.

How can we spot the difference between true psychological science and this type of *pseudoscience*, which is based on fantasy, folk wisdom, or superstitions? First of all, note that *pseudo* means "false." Second, although pseudoscientific claims often give the appearance of science, they do not follow the basics of the scientific method, which will be covered in depth later in this chapter.

To offset the dangers of pseudoscience, organizations and websites, like Skeptical Inquirer and Snopes, and some individuals, like James Randi (see photo), have dedicated their lives to revealing the many problems posed by these beliefs (Arkowitz & Lilienfeld, 2017; Gordin, 2017; Loftus, 2010). If you'd like to test your own possible misconceptions about psychology, try the following **Test Yourself**.

PA Practical Application

Test Yourself: True or False?

_____ **1.** Hypnosis improves the accuracy of our memories.

_____ **2.** Advertisers and politicians often use subliminal persuasion to influence our behavior.

_____ **3.** Most brain activity stops when we're asleep.

_____ **4.** Punishment is the most effective way to permanently change behavior.

_____ **5.** Our personalities are "set in plaster" by age 30.

_____ **6.** The best way to learn and remember information is to "cram," or study it intensively during one concentrated period.

_____ **7.** Vaccination is a leading cause of autism.

_____ **8.** Polygraph ("lie detector") tests can reliably detect when a person is lying.

_____ **9.** Violent offenders generally have a diagnosis of mental illness.

_____ **10.** People with schizophrenia have multiple personalities.

_____ **11.** Opposites attract and make better and more long-lasting romantic partners.

_____ **12.** In an emergency, the more people who are present the more likely you are to get help.

Answers: As you'll discover by reading this text, all 12 of these statements are *false*. We include them to demonstrate how common sense beliefs about psychology are often not backed by scientific facts, and to increase your interest in becoming a more informed consumer of psychological science.

Why Study Psychology? If you've taken other science courses, you know that physicists explain the physical world in terms of mathematics, chemists explain processes at the atomic level, and biologists examine organisms at a cellular level. Unlike these scientists and their science courses, psychologists study non-physical phenomena—behavior and mental processes. However, like all scientists, psychologists follow the scientific method (fully discussed later in this chapter), and our research findings help us understand why other people (and even non-human animals) think, feel, and act in the ways they do.

As an example, we all experience minor and significant choices and problems in our relationships, school, and work life, but few (if any) would simply flip a coin to choose a romantic partner or career. Thankfully, the psychological principles you'll discover in this course will maximize your chances of choosing and maintaining successful romantic and career relationships. They'll also demonstrate how applying these general principles can improve overall human life. In addition, given that psychology is an integral part of today's political, social, and economic world, studying it will broaden your general knowledge and increase your academic and personal success as a global citizen.

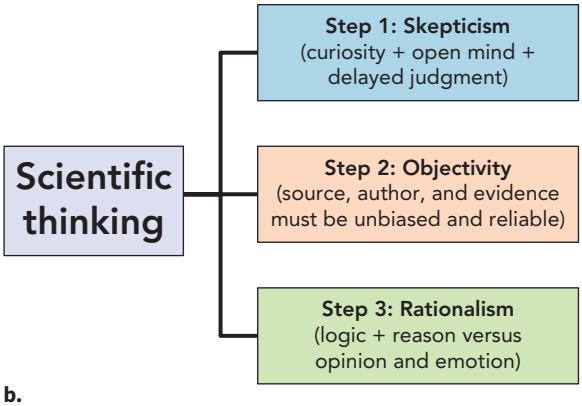
Scientific Thinking Now that we've defined psychology, how it differs from pseudoscience, and why we should study it, let's explore why psychology emphasizes **scientific thinking.** As you know, our world is filled with controversial ideas, so-called "fake news," and unreliable personal beliefs and opinions. How do we evaluate this abundance of information and the competing claims of advertisers and politicians? To separate scientific facts from "alternative facts," scientific theories from "personal theories," and sense from nonsense, we need scientific thinking (see **Figure 1.1**). This approach to information combines a high degree of *skepticism* (questioning what "everybody knows"), followed by *objectivity* (using empirical data to separate fantasy from reality) and *rationalism* (practicing logical reasoning). Let's carefully examine these three steps:

Scientific thinking An approach to information that combines a high degree of skepticism with objectivity and rationalism.

- **Step 1: Skepticism** Many people mistake skepticism for harsh, unthinking attacks on all claims. Instead, the term "skepticism" comes from the Greek word *skeptikos*, which means "to consider carefully." Skepticism encourages curiosity and an open-minded approach to what "everybody knows," while also delaying judgment until persuasive, empirical data is available.
- **Step 2: Objectivity** The persuasive empirical data required in Step 1 is based on objectivity. The source, author, and evidence must be carefully evaluated for bias and reliability. Using empirical data, scientific thinkers can separate *facts* from pseudofacts or so-called "alternative facts," and scientific *theories* from opinions and hunches. A *fact* for scientists is a statement backed by direct, verifiable evidence, whereas a *theory* is a tool that predicts facts. In short, scientific thinking will help us separate fantasy from reality.

The Advertising Archives/Alamy Stock Photo

a.



b.

FIGURE 1.1 **Scientific thinking versus "snake oil"** **(a)** In the 19th century, ads like these were used to sell cure-all elixirs designed for all kinds of ailments. Today, the term "snake oil" is a euphemism for deceptive, fraudulent marketing and "fake news." **(b)** Try using these three steps to evaluate the "snake oil" ad. Can you see how this type of scientific thinking can also be applied when assessing modern ads for "miracle drugs" and political claims for "miracle solutions"?

- **Step 3: Rationalism** Even when we've successfully practiced skepticism and objectivity, we may still require logic and reason to overcome opinions and emotions. For instance, many people continue to text and drive despite overwhelming evidence documenting its dangers. Rationalism requires us to logically value truth and to follow established scientific facts and warnings.

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

Scientific versus Critical Thinking

How does scientific thinking differ from **critical thinking**, *the process of objectively evaluating, comparing, analyzing, and synthesizing information* (Caine et al., 2016; Halpern, 2014)? Critical thinking is closely linked with theoretical philosophy, pedagogy, and the social sciences, and over the years it has evolved into an umbrella-type term with numerous components and skills. In contrast, scientific thinking is narrower and focused more on empiricism and the processes underlying scientific research (e.g., generating and systematically testing hypotheses).

Given psychology's scientific emphasis, we've chosen scientific thinking as the general theme embedded throughout this text, as well as in special features, like the STH *Scientific Thinking Highlight* and the RC *Scientific Thinking: Research Challenge*. As you'll also see throughout this text, scientific thinking is closely linked with practical applications that can be a valuable asset to your academic and personal life. For example, you're almost guaranteed to receive higher grades on all your assignments if you consult reliable sources, like those in **Table 1.1**, and when you practice the three steps of scientific thinking—skepticism, objectivity, and rationalism. Employing scientific thinking will likewise improve your personal life by helping you evaluate new ideas and avoid making hasty and costly decisions.

Take-Home Message

Scientific and critical thinking are both vital skills and components of becoming an educated person. When facing life's inevitable problems, having the ability to think objectively and rationally is essential to personal growth and understanding.

Psychology's Origins

Ancient scholars asked many of the same questions about human nature that modern psychologists are still examining. However, psychology is a relative newcomer to the scientific world—less than 150

TABLE 1.1 Sample Reliable Resources for Scientific Thinking

American Psychological Association [apa.org]	Research Digest [digest.bps.org.uk]	PsyBlog [spring.org.uk]
Association for Psychological Science [psychologicalscience.org]	PsychINFO [apa.org/pubs/databases/psycinfo/]	Snopes [snopes.com]
American Psychiatric Association [psychiatry.org]	We're Only Human [psychologicalscience.org/news/were-only-human]	Neuroskeptic [realclearscience.com/authors/neuroskeptic/]
Association for Behavior Analysis International [abainternational.org]	ScienceAlert [sciencealert.com]	Skeptical Inquirer [skepticalinquirer.org]
Canadian Psychological Association [cpa.org]	PsychCentral [psychcentral.com]	Skeptic magazine [skeptic.com]
British Psychological Society [bps.org.uk]	Scientific American Mind [scientificamerican.com/mind/]	TED Talks [ted.com/topics/psychology]
National Institute of Mental Health [nimh.nih.gov/news]	Public Library of Science [plos.org]	Google Scholar [scholar.google.com]
The Psychonomic Society [psychonomic.org]	Mindhacks [mindhacks.com]	

years old. In this section, we will explore the beginnings of psychological science, and how as interest in the new field grew, psychologists adopted various perspectives on the "appropriate" topics for psychological research and the "proper" research methods. These diverse viewpoints and subsequent debates molded and shaped modern psychological science.

Early Pioneers—Wundt, Titchener, and James

Psychology's history as a science began in 1879, when Wilhelm Wundt [VILL-helm Voont], generally acknowledged as the "father" of psychology, established the first psychological laboratory in Leipzig, Germany. Wundt and his followers were primarily interested in conscious experiences—how we form sensations, images, and feelings. Their chief methodology was termed "introspection," and it relied on participants' self-monitoring and reporting on conscious experiences (Freedheim & Weiner, 2013; Weger et al., 2019).

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. But it did establish a model for studying mental processes scientifically.

Structuralism's intellectual successor, **functionalism**, examined the way mental and behavioral processes function to enable humans and other animals to adapt to their environment. William James was the leading force in the functionalist school (**Figure 1.2**). 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. Today, James is widely considered the "father" of American psychology.

Psychoanalytic Perspective

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 unresolved desires and conflicts, as well as memories of past experiences that lie outside personal awareness—yet still exert great influence. 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 develop from unconscious sexual or aggressive motives and conflicts between "acceptable" and "unacceptable" behaviors. His theory led to an influential theory of personality and a system of therapy known as *psychoanalysis* (Chapters 12 and 14).

Structuralism Wundt's and Titchener's approach that used introspection to study the basic elements (or structures) of the mind.

Functionalism James's approach that explored how mental and behavioral processes function to enable organisms to adapt to the environment.

Psychoanalytic perspective An approach to psychology developed by Sigmund Freud, which focuses on unconscious processes, unresolved conflicts, and past experiences.

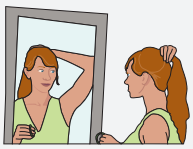
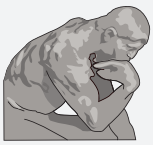
Bettmann/Getty Images

FIGURE 1.2 William James (1842–1910) William James founded the perspective known as functionalism and established the first psychology laboratory in the United States, at Harvard University. In modern times, he is commonly referred to as the "father" of American psychology, whereas Wundt is considered the "father" of *all* psychology.

Modern Psychology

As summarized in **Table 1.2**, 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.

TABLE 1.2 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 (S-R) relationships and consequences for behavior	How do reinforcement and punishment affect behavior? 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 	Mental processes used in thinking, knowing, remembering, and communicating	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 reproduction	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?
	Why do we need multiple perspectives? What do you see in this figure? Is it two profiles facing each other, a white vase, or both? 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.	

Psychodynamic Perspective

Freud's non-scientific approach and his 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—while focusing more on social and cultural factors and less on sexual drives.

Behavioral Perspective

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 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 and non-human animals were ideal participants for this research. One of the best-known behaviorists, B. F. Skinner, was convinced that behaviorist approaches could be used to "shape" both human and non-human animal behavior (**Figure 1.3**). As you'll discover in Chapters 6 and 14, therapeutic techniques rooted in the behavioristic perspective have been most successful in treating observable behavioral problems, such as those related to phobias and alcoholism (Anker et al., 2016; Coates et al., 2018; Yoshinaga et al., 2019).

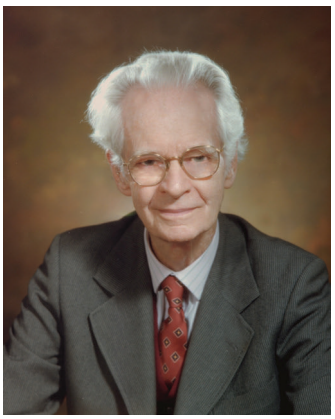
Humanistic Perspective

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 of one's talents and capabilities). According to Carl Rogers and Abraham Maslow, two central figures within this perspective, all individuals are born with free will and naturally strive to develop and move toward self-actualization. Like the psychoanalytic perspective, the humanistic approach developed an influential theory of personality and its own form of psychotherapy (Chapters 12 and 14).

The humanistic approach also led the way to a contemporary research specialty known as **positive psychology**—the study of optimal human functioning (Diener & Tay, 2015; Sanderson, 2019; Seligman, 2003, 2018). For an example of how this research has direct, practical applications, see the PP **PositivePsych**. (Recognizing the increasing research focus on positive psychology, as well as its direct applicability to the real world and your everyday life, we have included a special *PositivePsych* feature in each chapter of this text. We hope you enjoy them.)

Cognitive Perspective

One of the most influential modern approaches, the **cognitive perspective**, emphasizes the mental processes we use in thinking, knowing, remembering, and communicating (Farmer & Matlin, 2019; Greene, 2016). These mental processes include perception,



Bachrach/Archive Photos/Getty Images

FIGURE 1.3 B. F. Skinner (1904–1990) B. F. Skinner was one of the most influential psychologists of the 20th century.

Psychodynamic perspective A modern approach to psychology that emphasizes unconscious dynamics—motives, conflicts, and past experiences; based on the psychoanalytic approach.

Behavioral perspective A modern approach to psychology that emphasizes objective, observable environmental influences on overt behavior.

Humanistic perspective A modern approach to psychology 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; emphasizes positive emotions, traits, and institutions.

Cognitive perspective A modern approach to psychology that focuses on the mental processes used in thinking, knowing, remembering, and communicating.

PP Practical Application: PositivePsych

What Makes Us Happy?

(APA Goal 1.3) Describe applications of psychology

One of the most consistent findings in positive psychology is that other people make us happy. "Simply" building and maintaining relationships tends to significantly improve our overall happiness and well-being (Diener & Tay, 2015; Galinha et al., 2016; Lee & Kawachi, 2019). As shown in the photo, even just talking with strangers leads to higher levels of happiness. Researchers who asked riders on trains and buses to either quietly sit alone or talk to a stranger found that those who talked to a stranger reported more positive feelings than those who sat alone (Epley & Schroeder, 2014).

In addition, contrary to the popular belief that "money buys happiness," research shows that once we have enough income to meet our basic needs, additional funds do not significantly increase our levels of happiness and well-being (Kushlev et al., 2015; Whillans & Macchia, 2019). Furthermore, 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).

kali9/E+/Getty Images

memory, imagery, concept formation, problem solving, reasoning, decision making, and language. Many cognitive psychologists also use an *information-processing approach*, likening the mind to a computer that sequentially takes in information, processes it, and then produces a response.

Biological perspective
A modern approach to psychology that focuses on genetics and biological processes.

Biological Perspective

During the past few decades, scientists have explored the role of biological factors in almost every area of psychology. Using sophisticated tools and technologies, psychologists 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.

PAN Practical Application of Neuroscience

Why are genes so important to psychologists? Research shows that genes influence many aspects of our behavior, including how kind we are to other people, whom we vote for in elections, and even whether or not we decide to purchase a handgun (Barnes et al., 2014; Ksiazkiewicz et al., 2016; D. S. Wilson, 2015). Recent research even shows that our genes may predict dog ownership. A study examining 35,035 twin pairs found that genes explain more than half of the variation in dog ownership, showing that the choice of owning a dog is heavily influenced by our genetic make-up (Fall et al., 2019).

Evolutionary perspective
A modern approach to psychology that stresses natural selection, adaptation, and reproduction.

Natural selection Darwin's principle of an evolutionary process in which heritable traits that increase an organism's chances of survival or reproduction are more likely to be passed on to succeeding generations.

Sociocultural perspective
A modern approach to psychology that emphasizes social interaction and the cultural determinants of behavior and mental processes.

Evolutionary Perspective

The **evolutionary perspective** stresses natural selection, adaptation, and reproduction (Buss, 2011, 2015; Dawkins, 2016; Goldfinch, 2015). This perspective stems from the writings of Charles Darwin (1859), who suggested that natural forces select traits that aid an organism's survival. This process of **natural selection** occurs when a particular genetic trait gives an organism a reproductive advantage over others. Because of natural selection, the fastest, strongest, smartest, or otherwise most fit organisms are more likely to live long enough to reproduce and thereby pass on their genes to the next generation. According to this 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.

Sociocultural Perspective

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.

[AQ1] For instance, a study involving three separate experiments found that professional recruiters tend to ask different questions of job applicants depending on their ethnicity (Wolgast et al., 2018). When job applicants were of the same ethnicity as that of the potential employer (called the ingroup), professional recruiters tended to help prepare applicants for interviews by focusing on questions pertaining to the match between the applicants' abilities and the job demands (person-job fit). However, when the applicants were of different ethnicities (called the outgroup), the job recruiters helped prepare applicants for questions related to how well they had integrated the cultural norms (person-culture fit) and how well they matched their potential work team (person-culture fit). As you might expect, the ingroup applicants who were trained toward person-job fit were seen as more suitable for employment (see photo). Can you see how research like this and the sociocultural perspective could highlight and potentially reduce some of the unconscious biases that perpetuate racism and discrimination?

DW labs Incorporated/Shutterstock.com

In connection with the sociocultural perspective, during the late 1800s and early 1900s, most colleges and universities provided little opportunity for women and people of color, either as students or as faculty members. 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. For example, married women could not be teachers or professors in co-educational settings during this time in history. In Mary Calkins's 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 in 1894. She wrote several influential books and served as the second female president of the APA.

Francis Cecil Sumner became the first Black person in the United States to earn a Ph.D. in psychology in 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 person of color 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**).

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

Source: Library of Congress Prints and Photographs Division [LC-USZ62-126439]. Public Domain.

FIGURE 1.4 Kenneth Clark (1914–2005) and Mamie Phipps Clark (1917–1985) Kenneth Clark and 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.

Biopsychosocial Model

The seven major perspectives have all made significant contributions to modern psychology. This explains 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, and evolution), psychological factors (learning, personality, and 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 a look at how biopsychosocial forces affect some Native Americans and other individuals who are not from the dominant culture, see the GCD **Gender and Cultural Diversity**.

Biopsychosocial model
Modern psychology's theme that sees biological, psychological, and social processes as interrelated and interacting influences.

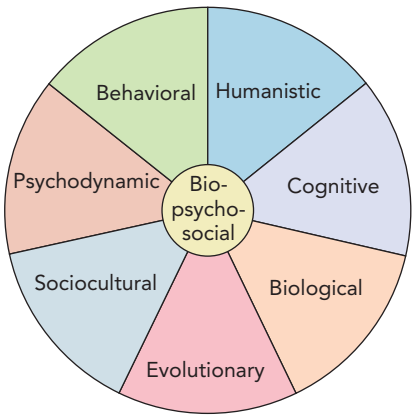


FIGURE 1.5 The biopsychosocial model The biopsychosocial model recognizes that there is usually no single cause for our behavior or our mental states. Our moods and feelings, for instance, are often influenced by genetics and neurotransmitters (biological), our learned responses and patterns of thinking (psychological), and our socioeconomic status and cultural views of emotion (sociocultural).

Careers and Specialties 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' jobs or careers have little or no direct connection with therapy. Instead, they 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**, a bachelor's degree in psychology equips you with valuable life skills and opens up several career paths. 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.

GCD Gender and Cultural Diversity

Biopsychosocial Forces and Acculturative Stress

(APA Goal 2.5) Incorporate sociocultural factors in scientific inquiry

Have you ever lived in or dreamed of emigrating to another country? If so, you probably imagine yourself fully enjoying all the excitement and adventure. But have you considered the stress and stressors that come with adapting to and surviving in a new culture?

Courtesy of Linda Locklear

Courtesy of Linda Locklear

International travelers, military personnel, immigrants, refugees, individuals who move from one social class to another, and even the native-born may fall victim to the unspoken and unforeseen stressors of adjusting their personal and family values, their cultural norms, and maybe their style of dress to the new or dominant culture (like the young Native American woman in these two photos). These required adjustments are referred to as *acculturation*, whereas the associated stress is called *acculturative stress*.

Naturally, this type of stress places great demands on the individual's biological, psychological, and social well-being—the *biopsychosocial forces* (Berry et al., 1987; Corona et al., 2017; Zvolensky et al., 2016). However, the degree of acculturative stress depends in part on the method of coping an individual chooses when entering a new society. Researchers have identified four major approaches to acculturation (Berry & Ataca, 2010; Urzúa et al., 2017):

1. **Integration** As you might expect, a choice toward *integration* typically leads to the lowest levels of acculturative stress. People who have a high desire to maintain their original cultural identity, while also having a strong motivation to learn from and seek positive relations mainly with the new culture are pursuing the path to integration. However, stress will still be a factor if the person has been forced to emigrate, or if the new country is reluctant to accept newcomers and distrustful of ethnic and cultural diversity.
2. **Assimilation** People who choose to *assimilate* typically have a low identification with their culture of origin and a high desire to identify with the new culture. They tend to have the next lowest level of stress, but there are still many problems, presumably due to the loss of cultural support from other members of the original culture who do not assimilate.
3. **Separation** Individuals who choose to *separate* often place high value on their original culture and do not want to adapt to the new one. They generally have the next to highest level of acculturative stress, which is most likely due to being separated from the new or dominant culture. Their stress levels are even higher for those who are forcibly separated by prejudice and discrimination than for those who separate voluntarily.
4. **Marginalization** People who have a low identification with both the new culture and their culture of origin are likely to be *marginalized* from the dominant culture. This pattern normally leads to the highest levels of acculturative stress, presumably due to the fact that they tend to live on the "margins" and lack the connections and support of either the old or new cultures.

To check your understanding of these four patterns, see the following **Test Yourself**.

Q Test Yourself: Cultural Reactions to Stress

Picture yourself as a college graduate who's been offered a high-paying job that will allow you to move from a lower socioeconomic class to the middle or upper class. What you don't know is that your change in status will likely lead to considerable acculturative stress. In anticipation of this change, will you:

- **Adopt the *majority* culture and seek positive relations with the new or dominant culture?**
- **Maintain your original cultural identity and avoid relations with the dominant culture?**

Your responses to these two questions tend to place you into one of the four major approaches to acculturation—and will likely predict your level of stress.

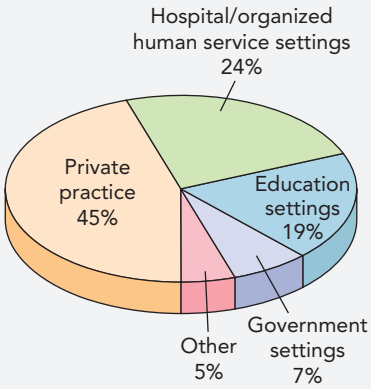
SOPA Images Limited/Alamy Stock Photo

As an example of acculturative stress, consider Malala Yousafzai, the famous activist (see photo), who, at the age of 17, was the youngest person ever to win the Nobel Peace Prize. The path to this honor began when she was an 11-year-old writing a courageous blog describing her life under the Taliban and her desire for all girls to have the chance to be educated. Tragically, her courage led to her being shot in the head at the age of 15 by the Taliban as she was on her way to school. After surviving the attempted murder, Malala went on to become an international activist who's traveled all over the world. Malala also recently published a book describing her experiences visiting refugee camps and the tens of millions of people who are currently displaced (Yousafzai, 2019).

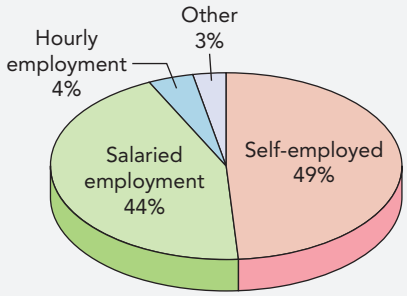
Although Malala and her family emigrated to the UK after the attack on her life, she plans to return to the home she loves in Pakistan after completing her education at Oxford University. Which of the four approaches to acculturation do you think she has followed while living in the UK?

Take-Home Message **Later in this chapter, we will introduce the topic of *ethnocentrism*, believing that one's culture is typical of all cultures and/or that one's own culture is the "correct" one. Can you see how ethnocentrism would logically increase acculturative stress if you decide to relocate or even just when you're traveling? Perhaps the most important question is how can we as individuals and citizens of the world help reduce the anxiety, depression, alienation, and physical illnesses associated with forced and voluntary emigration, and the inevitable acculturative stress?**

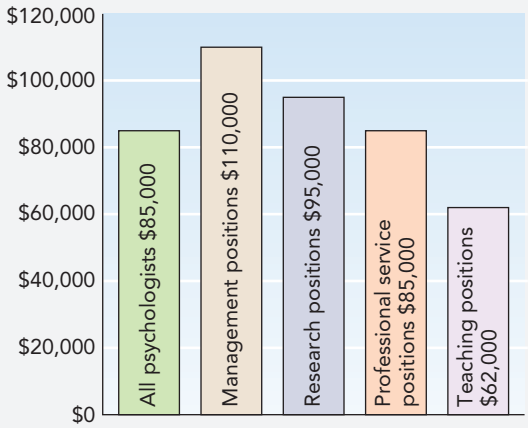
TABLE 1.4 Sample Careers and Specialties in Psychology



a. Where psychologists work/primary employment settings



b. Employment arrangement



c. Median annual reported salaries 2015

Where psychologists work, their employment arrangements, and median salaries Note that all data are compiled from self-reported information.

Source: American Psychological Association (2016).

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 non-human 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	Examines 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	Researches 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
Gender and cultural psychologists	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, illness, and health-related behaviors
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 special needs related to a disability and 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
Sport psychologist	Applies principles of psychology to enhance physical performance

Retrieval Practice 1.1 | What Is Psychology?

Self-Test Completing this self-test, and then checking your answers by clicking on the answer button or by looking in Appendix B, will provide immediate feedback and helpful practice for exams.

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. _____ relies on common beliefs, folk wisdom, or even superstitions and does not follow the basics of the scientific method.
   - **a.** Pseudoscience
   - **b.** Astrophysics
   - **c.** Astronomy
   - **d.** None of these options
3. _____ is generally acknowledged to be the father of psychology.
   - **a.** Sigmund Freud
   - **b.** B. F. Skinner
   - **c.** Wilhelm Wundt
   - **d.** William Tell
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

Q Test Your Critical Thinking

1. Psychologists are among the least likely to believe in psychics, palmistry, astrology, and other paranormal phenomena. Why might that be?
2. Which of the seven modern perspectives of psychology do you most agree with? Why?
3. How might the biopsychosocial model explain difficulties or achievements in your own life?

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Real World Application Question

[AQ1] Does your ethnicity affect the type of questions you're asked in a job interview?

Hint: Look in the text for **[AQ1]**

1.2 Scientific Research

LEARNING OBJECTIVES

Retrieval Practice While reading the upcoming sections, respond to each Learning Objective in your own words.

Discuss the key principles underlying the science of psychology.

- **Review** psychology's four main goals.
- **Compare and contrast** the fundamental goals of basic and applied research.
- **Describe** the scientific method, its key terms, and its six steps.
- **Discuss** the ethical concerns and guidelines for psychological research.

Real World Application Questions

[AQ2] Can strength training decrease depression?

[AQ3] Can a diet high in fats and sugars impair learning and memory?

Psychology's Four Main Goals

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 and mental processes by making careful scientific observations. Description is usually the first step in psychological research. 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. One of the most enduring debates in science is the **nature–nurture controversy**. Are we controlled by biological and genetic factors (the nature side) or by the environment and learning (the nurture side)? As you will see throughout the text, psychology 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. As expected, research suggests numerous interacting causes or explanations for aggression, including culture, learning, and other biopsychosocial factors (Bushman, 2016; Rodriguez-Hidalgo et al., 2018; Salimi et al., 2019).
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 (Denson et al., 2018; Woodin et al., 2016; Zinzow & Thompson, 2015), 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 science 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 environments, 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.)

Nature–nurture controversy An ongoing dispute about the relative contributions of nature (biological and genetic factors) and nurture (environment and learning) in behavior and mental processes.

Basic and Applied Research

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 13 and 14, 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.

Basic research A type of research primarily conducted to advance core scientific knowledge; most often conducted in universities and research laboratories.

Applied research A type of research primarily conducted to solve practical, real-world problems; generally conducted outside the laboratory.

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.

Leigh Green/Alamy Stock Photo

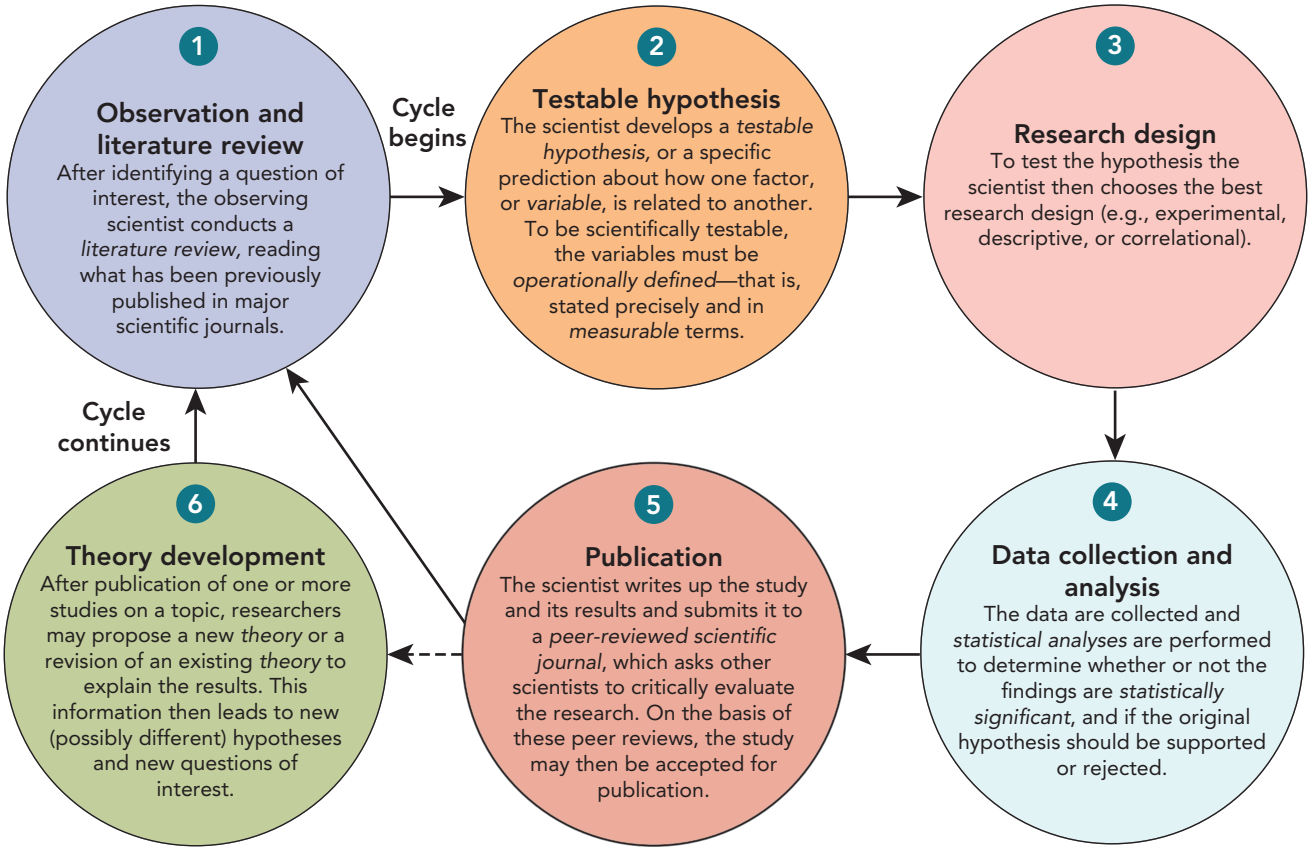
FIGURE 1.6 Applied research in psychology Can you see how this billboard advertisement is a good example of both basic and applied research? Scientific findings on the global climate crisis and its resulting prolonged droughts has led to later studies and approaches to deal with the real-world water shortage problem—restricted times and alternating days for watering outdoors in California.

The Scientific Method

In contrast to the previously discussed problems with *pseudoscience*, which relies on unsubstantiated beliefs and opinions, psychological science is based on rigorous, systematic scientific methods. Psychologists follow strict, standardized procedures so that others can understand, interpret, and repeat or test their findings. During both basic and applied research, most scientific investigations consist of six basic steps, collectively known as the **scientific method** (**Process Diagram 1.1**).

STOP! This Process Diagram contains essential information NOT found elsewhere in the text, which is likely to appear on quizzes and exams. Be sure to study it CAREFULLY! Research has shown that having diagrams showing how a process works results in higher performance on tests than having no diagrams at all, or just a text outline of the process (Bui & McDaniel, 2015). This and other research, along with our own experiences as educators, explains why we've included process diagrams throughout this text.

PROCESS DIAGRAM 1.1 The Scientific Method Although there is no one, official "scientific method" that is accepted by all scientists, scientific investigations do follow a progression of logical steps while collecting data, like those in this diagram. Note also that scientific knowledge is constantly evolving and self-correcting—as shown by the arrows connecting the steps in this diagram. As soon as one research study is published, the cycle almost always begins again. The scientific method's ongoing, cyclical nature often frustrates students. In most chapters, you will encounter numerous, and sometimes conflicting, scientific theories and research findings. You'll be tempted to ask: "Which one is right?" But, as with most aspects of behavior, the "correct" answer is almost always a combination and interaction of multiple theories and competing findings. The good news is that such complex answers lead to a fuller and more productive understanding of behavior and mental processes. (Note the dotted line from Step 5 to Step 6. It indicates that theories may develop after a combination of repeated testing and numerous supportive publications.)



Step 1: Observation and Literature Review

Do you recall from the beginning of this chapter that *scientific thinking* is characterized by curiosity—an eager willingness to question and explore the world around us? Curious psychologists, much like professional journalists, begin with a "simple" *observation* and questions about who, what, when, where, why, or how something is happening. For instance, have you observed all the *Retrieval Practice* exercises sprinkled throughout each chapter of this text, including those at the ends of sections and those within the Learning Objectives and Key Terms? As a curious student, thinking

scientifically and critically, are you wondering whether completing these activities is worth your time? Or whether doing so will help you do better on exams?

If so, let's conduct an imaginary exercise that will answer these questions about retrieval practice, while helping you also master key terms and concepts within the six steps of the scientific method. Beginning with Step 1 of your research, you'll need to clarify the specific factors you want to observe and measure—in this case, retrieval practice and exam grades. (Note that these specific factors are officially referred to as **variables**, which are simply any factors that can vary or change and can be observed, measured, and verified.) After completing this first part of Step 1, you would perform a *literature review*, which involves consulting professional journals and studying previous research findings on retrieval practice and exam grades.

Variable Any factor that can vary or change and can be observed, measured, and verified.

Step 2: Testable Hypothesis

To complete Step 2, you need to create a tentative and testable **hypothesis**, which is a statement and/or possible explanation of the relationship you've observed between two or more variables. This hypothesis should be based on the information you gathered during your literature review in Step 1, and it should provide predictions about the outcome of your study that can be tested in some way. To make such predictions, you'll need to explicitly state how each of the variables in your hypothesis will be **operationally defined** (observed, manipulated, and measured).

Hypothesis A tentative and testable statement and possible explanation about the relationship between two or more variables; an educated guess about the outcome of a scientific study.

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

Returning to the retrieval practice exercise, a better grade on your exams might be operationally defined as earning a grade one letter higher than the one you earned on your previous exam. Your combined hypothesis and operational definition might be: "Students who spend two hours studying Chapter 1 in this text and one hour completing the Retrieval Practice will earn higher scores on a standard academic exam than students who spend three hours studying Chapter 1 without completing the Retrieval Practice."

Steps 3 and 4: Research Design/Data Collection and Analysis

For Step 3, you would most likely choose an experimental research design. To begin the data collection and analysis of your experiment (Step 4), you might recruit 100 volunteers from various classes on your college campus. Of these, you would then **randomly assign** 50 to Group 1 (Retrieval Practice) and the other 50 to Group 2 (no Retrieval Practice). After allowing both groups to study for three hours, you would present and score a 20-point quiz on the material. Then you would record and compare the scores of the two groups.

Random assignment A research technique for assigning participants to experimental or control conditions so that each participant has an equal chance of being in either group; minimizes the possibility of biases or preexisting differences within or between the groups.

Another important approach to data collection and analysis is required when psychologists want to reveal overall trends that may not show up in individual studies, or when different researchers report contradictory findings. When facing this dilemma, psychologists employ a popular statistical technique called **meta-analysis**, which averages or combines the results of many studies to reach conclusions about the overall weight of the evidence.

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

[AQ2] For example, a meta-analysis of 33 studies and over 2,000 participants found that resistance exercise training significantly reduced the incidence of depression (Gordon et al., 2018). Surprisingly, even when participants saw few physical changes from this type of strength training, they still tended to see improvements in their overall mood (see photo).

lightfieldstudios/123RF

Step 5: Publication

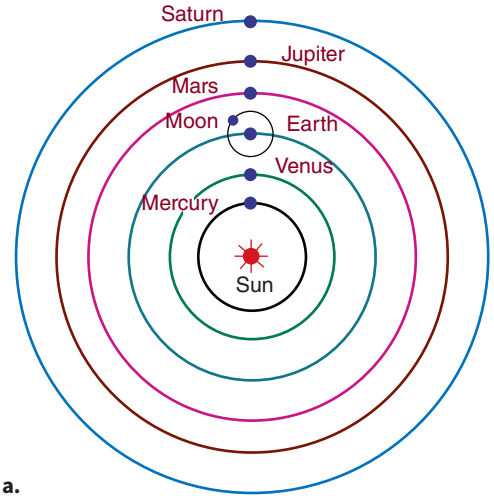
In this step, you would submit your research for possible publication, assuming your results were *statistically significant*. Before accepting your findings for publication, most scientific journals will send your paper to reputable scientists for *peer review.* These reviewers will evaluate and comment on the quality, significance, and originality of your research. If the reviews are positive and the suggested corrections are minor, you will have the opportunity to make corrections and your paper will likely be accepted for publication.

The journal editors will then decide what month and year to publish your article. Note that authors and peer reviewers are NOT paid for their work. Their free services are all part of the ethical standards of the academic community—members share their findings and contribute their work for the general advancement of science.

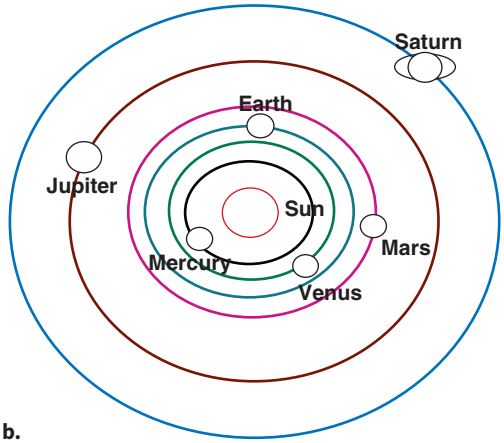
In addition to making a contribution to science, one small payoff for authors/researchers is that they may be cited in other journal articles or in textbooks like this one. As you've

Theory A broad explanation for a set of observations or facts that have been substantiated through repeated testing.

Replicate To repeat or duplicate the essence of a research study using different situations or participants to determine if the basic findings can be reproduced; replication helps demonstrate reliability of research findings.



a.



b.

FIGURE 1.8 Opinions versus facts—science to the rescue Early experiments, conducted primarily by Nicolaus Copernicus (1473–1543), led to a collection of facts and ultimately to the theory that the Earth was not the center of the universe, as generally assumed at the time. Instead, it was thought to rotate around the sun with the other planets in concentric circles (**a**). Later scientists (astronomers Johannes Kepler and Tycho Brahe) built on this Copernican (heliocentric) theory with additional experiments that led to a revised theory, in which the orbits were not circular, but rather elliptical (**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 of galaxies. Can you see how these incremental changes illustrate the value of scientific theories and their ever-changing—and self-correcting nature?

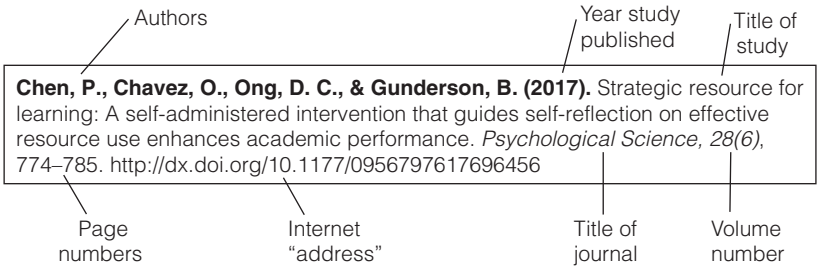


FIGURE 1.7 How to interpret a scientific journal reference Note that the citation for this particular reference would appear in the chapter as (Chen et al., 2017), with the et al. indicating multiple authors. However, as shown in this figure, the names of all four authors, along with the article title, and the journal, book, or other reference work in which the article was published are included in the full journal reference. The citation also includes the doi (digital object identifier), which is a string of letters, numbers, and symbols allowing easy access to that specific article on the Internet. Although instructors rarely expect you to memorize the names and dates in parentheses, as a scientific and crititcal thinker you may want to use this set of full references (found at the end of this text) to double-check our citations, as a reliable source for research projects, and for additional information on a topic of interest.

noticed throughout this text, citations to publications appear in parentheses at the end of many sentences. These citations, such as (Aagaard, 2019; Yong, 2018), list just the authors' names and the dates of their publications. However, **Figure 1.7** shows what a complete reference looks like and how to interpret its various parts.

Step 6: Theory Development

Once you've published your research findings, you (and other researchers) might discover additional findings on effective study techniques. After many related findings have been collected and confirmed, scientists can sometimes develop a **theory**, which is a broad explanation for a set of observations or facts that have been substantiated through repeated testing. Theories are particularly helpful because they often lead to new hypotheses, other research, important predictions, and even all-new refined theories. In sum, *science is the cumulative, cyclical process of developing accurate theories using the scientific method.*

Unfortunately, the term *theory* is also commonly (and mistakenly) used to refer to a simple guess, a hunch, or even just personal opinion. In fact, *theory* has been listed as one of the seven most commonly misused scientific terms (Ghose, 2013). As mentioned in our discussion of scientific thinking, theories are tools that predict facts and facts are statements backed by direct verifiable evidence. Far too often, valid scientific findings and widespread agreement on issues like the climate crisis are ignored or diminished by those who claim that these results are "just a theory." Can you see why it's so important to understand that scientific theories are based on empirical evidence, not just simple hunches or opinions? The value of facts over opinions and science's self-correcting nature are further explained in **Figure 1.8**.

Before leaving this section on the six steps of the scientific method, be sure to carefully study the following **STH Scientific Thinking Highlight**, which alerts you to possible benefits and problems that may occur when other researchers attempt to repeat, or **replicate**, the original research. Also, given that we began this section on the scientific method by asking you to imagine yourself as a researcher interested in the effectiveness of retrieval practice exercises, you'll be interested to know that actual published research does, in fact, support the power of retrieval practice in improving retention and exam scores (Carpenter & Yeung, 2017; Schuetze et al., 2019). This and other research

STH Scientific Thinking Highlight

Psychology and the Replication Crisis

(APA Goal 2.1) Use scientific reasoning to interpret psychological phenomena

As you might expect, publication (Step 5 in the research method) and replication are core to scientific research. Unfortunately, psychology, medicine, and other sciences have recently come under heavy fire for a serious lack of replication of their original research findings (Diener & Biswas-Diener, 2019; Open Science Collaboration, 2017). This so-called *replication crisis* first began when scientists revisited a large collection of previous publications, and found that only about one-third to just under two-thirds of all psychological studies could be replicated (Camerer et al., 2018; Open Science Collaboration, 2015; Yong, 2018).

Given that psychologists are justifiably alarmed by this crisis, let's examine the importance of replication using the three principles of scientific thinking. Recall from earlier in this chapter, *scientific thinking* is an approach to information that combines a high degree of *skepticism* (questioning what "everybody knows") with *objectivity* (using empirical data to separate fantasy from reality) and *rationalism* (practicing logical reasoning).

1. **Skepticism** As mentioned earlier, skepticism requires us to open-mindedly evaluate all claims, while also requiring persuasive evidence before we accept the claim. If numerous researchers, using different procedures or different participants in varied settings, can successfully replicate a study's results, the study is considered more persuasive and there is increased scientific confidence in the findings. Without replication, scientists might rely on research findings that wouldn't be found again because they result from a unique set of participants or a very specific procedure. For these reasons, replication helps satisfy the *skepticism* requirement of scientific thinking.
2. **Objectivity** Replication also helps address the need for *objectivity*. Only when scientists do the same thing and arrive at the same conclusion can we create a shared knowledge that we call objective. Using empirical data to separate fantasy from reality also allows psychological scientists to more successfully *describe, explain, predict*, and *change* behavior and mental processes—the four goals of psychology. Objectivity requires that if specific findings cannot be replicated, researchers cannot meet these core psychological goals, and we must look for other explanations and/or conduct further studies.
3. **Rationalism** There are sometimes logical and legitimate reasons why replication attempts fail. For instance, a series of studies started in the late 1960s and early 1970s found that children who were able to delay immediate gratification—by not eating a marshmallow placed right in front of them—showed better life outcomes, including greater academic achievement, lower levels of substance abuse, and so on, even 40 years later (Mischel, 2014; Mischel et al., 2011; Mischel & Ebbesen, 1970). Unfortunately, later studies reported results that were much weaker than those from the original series of studies (Watts et al., 2018).

One rational, logical explanation for the relative lack of replication of this so-called "Marshmallow study" could be that nowadays more young children attend preschool, which may help teach skills in delaying gratification. Furthermore, rather than measuring delay of gratification, the researchers might have inadvertently assessed the children's reaction to authority and whether or not they trusted adults.

Considering this and other studies and their lack of replication, researchers suggest that attempted replications may not have accurately recreated the original studies, the newer sample size might have been too small to produce significant results, or the replication of certain topics is difficult and unrealistic in current times (Diener & Biswas-Diener, 2019; Van Bavel et al., 2016).

Take-Home Message This *replication crisis* is very important and psychologists are responding to the challenge with a greater emphasis on transparency, better outlets for investigating and storing replication attempts, and even sharing data with other researchers to verify findings. Note also that psychological science has several built-in tools for self-correction. For example, as you discovered earlier in Process Diagram 1.1, the scientific method is cyclical and cumulative, which means that scientific progress results from repeatedly challenging and revising existing research.

Q Test Your Scientific Thinking

Imagine you are talking to someone who is a strong believer in or denier of climate change, and then to someone who is a strong proponent or opponent of childhood vaccinations.

1. **Describe how you could use the three key principles of scientific thinking—*skepticism, objectivity,* and *rationalism*—to have a meaningful conversation on these topics with these two individuals. How might this type of dialogue be helpful to both of you?**
2. **Try applying the three scientific principles to your personal beliefs and positions on climate change and childhood vaccinations. Did this type of scientific thinking help clarify or modify your own beliefs and positions? Why or why not?**

(Compare your answers with those of fellow students, family, and friends. Doing so will improve your scientific thinking and your media savvy.)

explains why self-testing is so often emphasized throughout this text. As you'll see in Chapter 3, practice testing can even reduce the negative effects of stress (Smith et al., 2016).

Psychology's Research Ethics

So far, we've discussed applied versus basic research, the scientific method, and the four basic goals of psychology. Now we need to examine the general ethics that guide psychological 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* (2016) 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. In addition, colleges and universities have institutional review boards (IRBs) that carefully evaluate the ethics and methods of research conducted at their institutions.

Respecting the Rights of Human Participants

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

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 their willingness to participate, including all physical risks, discomfort, and possibly unpleasant emotional experiences.
- **Voluntary participation** Participants must be told that they're free to decline to participate or to withdraw from the research at any time.
- **Restricted use of deception, followed by debriefing** If participants knew the true purpose behind certain studies, they might not respond naturally. In one of psychology's most famous, and controversial, studies (Milgram, 1963), researchers ordered participants to give electric shocks to another participant, who was really a confederate of the researcher, and was not actually receiving any shocks (Chapter 15). Although they were told that the study was examining the use of shocks to assist with learning, the researchers were actually testing participants' willingness to follow orders. Obviously in this case, participants' behavior could not be accurately measured if they were told the true focus of the study. Therefore, researchers occasionally need to temporarily deceive participants about the actual reason for the experiment.

  On the limited and rare occasions when deception is necessary, ethical guidelines and restrictions still apply. One of the most important is **debriefing**. After data collection has been completed, participants are provided with a full explanation of the research, including its design and purpose and any deception used. During this debriefing, researchers also address participants' misconceptions, questions, or concerns.

Debriefing A discussion procedure conducted at the end of an experiment or study; participants are informed of the study's design and purpose, possible misconceptions are clarified, questions are answered, and explanations are provided for any possible deception.

- **Confidentiality** Whenever possible, participants are provided anonymity. All personal information acquired during a study must be kept private, and not published in such a way that an individual's right to privacy is compromised.

Respecting the Rights of Non-human Animals

Although they are used in only seven to eight percent of psychological research (American Psychological Association [APA], 2009; Institute for Laboratory Animal Research [ILAR], 2010; Market Opinion Research International [MORI], 2005), non-human animals—mostly rats and mice—have made significant contributions to almost every area of psychology, including the brain and nervous system, health and stress, sensation and perception, sleep, learning, memory, motivation, and emotion.

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[AQ3] For instance, one study found that rats who are fed a diet high in fats and sugars show impairment in their learning and memory (Tran & Westbrook, 2015). This study could have critical, real-world implications for people, but do you see why this type of research would be unethical and impossible to conduct using human subjects?

Non-human animal research also has produced significant gains for some animal populations, such as the development of more natural environments for zoo animals and more successful breeding techniques for endangered species.

Despite the advantages, using non-human animals in psychological research remains controversial (see cartoon). Although debate continues about ethical issues in such research, psychologists take great care in handling research animals. Researchers also actively search for new and better ways to minimize any harm to the animals (APA Congressional Briefing, 2015; Morling, 2015; Pope & Vasquez, 2011).

Tom Chalkley/The New Yorker Collection/The Cartoon Bank

"He says he wants a lawyer."

Respecting the Rights of Psychotherapy Clients

Professional organizations, such as the APA and APS, as well as academic institutions and state and local agencies, all require that therapists, like researchers, maintain the highest ethical standards. Therapists must also uphold their clients' trust. All personal information and therapy records must be kept confidential. Furthermore, client records are made available only to authorized persons, and with the client's permission. However, therapists are legally required to break confidentiality if a client threatens violence to himself or herself or to others, if a client is suspected of abusing a child or an elderly person, and in other limited situations (Adi & Mathbout, 2018; Kress et al., 2013; Rabelo et al., 2019).

Take-Home Message What about ethics and beginning psychology students? Once friends and acquaintances know you're taking a course in psychology, they may want you to interpret their dreams, help them discipline their children, or even advise them on whether they should start or end their relationships. Although you will learn a great deal about psychological functioning in this text and in your psychology class, take care that you do not overestimate your expertise. Also remember that the theories and findings of psychological science are cyclical and cumulative—and continually being revised.

David L. Cole, a recipient of the APA Distinguished Teaching in Psychology Award, reminds us, "Undergraduate psychology can, and I believe should, seek to liberate the student from ignorance, but also the arrogance of believing we know more about ourselves and others than we really do" (Cole, 1982, p. 24).

Retrieval Practice 1.2 | Scientific Research

Self-Test Completing this self-test, and then checking your answers by clicking on the answer button or by looking in Appendix B, will provide immediate feedback and helpful practice for exams.

1. 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
2. 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
3. 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
4. A participant's agreement to take part in a study after being told what to expect is known as _____.
   - **a.** psychological standards
   - **b.** an experimental contract
   - **c.** debriefing
   - **d.** informed consent

Q Test Your Critical Thinking

1. What is the difference between a scientific theory, an opinion, and a hunch?
2. If you had a million dollars to contribute to either basic or applied research, which one would you choose? Why?

Real World Application Questions

[AQ2] Can strength training decrease depression?

lightfieldstudios/123RF

[AQ3] Can a diet high in fats and sugars impair learning and memory?

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Hint: Look in the text for **[AQ2]** and **[AQ3]**

1.3 Psychology's Research Methods

LEARNING OBJECTIVES

Retrieval Practice While reading the upcoming sections, respond to each Learning Objective in your own words.

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.
- **Review** the major research problems and biases, along with the possible safeguards against them.

Real World Application Questions

[AQ4] Does spending more time on Instagram decrease your psychological well-being?

[AQ5] Is there a correlation between years of education and physical health?

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* (**Figure 1.9**). As you'll see in the upcoming section, 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 reliable and predictable way.

Descriptive research A type of research that systematically observes and records behavior and mental processes without manipulating variables; designed to meet the goal of *description*.

Observation A descriptive research technique that assesses and records behavior and mental processes in natural, real-world and/or laboratory settings.

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

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 *observation*, *survey/interview*, *case study*, and *archival research*.

Observation

When conducting **observation**, researchers systematically assess and record participants' behavior in their natural, real-world and/or laboratory settings, without interfering. Many settings lend themselves to *naturalistic observation*, from supermarkets to airports to outdoor settings. 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 (infanticide). In Chapter 15, you'll read about an observational study of the human animal that examined whether Uber and Lyft drivers take longer to respond to ride requests from Black travelers than from White travelers (Ge et al., 2016). Can you guess what they found?

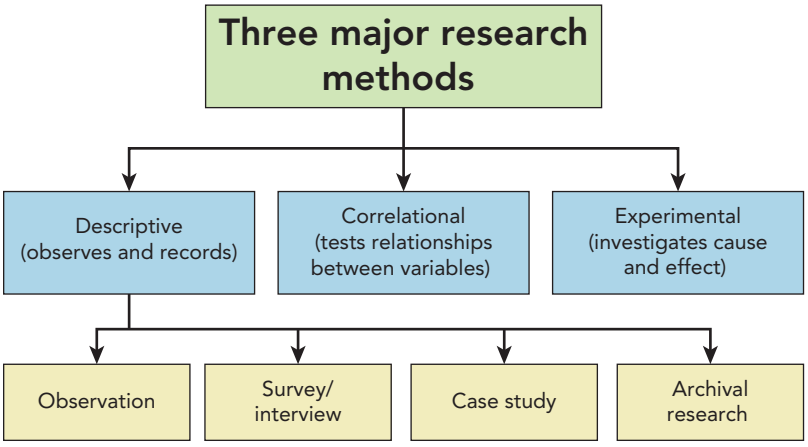


FIGURE 1.9 **An overview of psychology's major research methods**

The chief advantage of observation in a natural setting is that researchers can obtain data about real-world 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 of 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 1.10**).

Survey/Interview

Psychologists use **surveys/interviews** to ask people to self-report on

their behaviors, opinions, and attitudes (see cartoon). In Chapter 3, you'll read about survey research showing that even a single close childhood friendship can protect vulnerable children in lower socioeconomic circumstances from several psychological risk factors (Graber et al., 2016).

One key advantage of this approach is that researchers can gather data from many more people than is generally possible with other research designs. Unfortunately, most surveys/interviews 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 illegal behavior.

Education & Exploration 1/Alamy Stock Photo

FIGURE 1.10 **Laboratory observation** In this type of observation, the researcher may bring participants into a specially prepared room in the laboratory, with one-way mirrors, or hidden cameras and microphones. Using such methods, the researcher can observe school children at work, families interacting, or other individuals and groups in various settings.

Joe Dator/The New Yorker Collection/The Cartoon Bank

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/interviews or observation. For rare disorders or phenomena, researchers try to find someone who has the problem and then 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**. In Chapter 9, we'll share a fascinating case study that examined the impact of severe neglect during childhood on language acquisition. Research like this 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. Interestingly, archival data from 30,625 Himalayan mountain climbers from 56 countries found that expeditions from countries with hierarchical cultures, which believe that power should be concentrated at the top and followers should obey leaders without question, had more climbers reach the summit than did expeditions from more egalitarian cultures (Anicich et al., 2015). Sadly, they also had more climbers die along the way. The researchers concluded that hierarchical values impaired safety by preventing low-ranking team members from sharing their valuable insights and perspectives. (If you're wondering, American climbers ranked a little below midpoint in hierarchical values.)

Case study A descriptive research technique involving an in-depth study of a single research participant or a small group of individuals.

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

Correlational research A type of research that examines possible relations between variables; designed to meet the goal of *prediction*.

Correlational Research

As you've just seen, data collected from descriptive research provide invaluable information on behavior and mental processes. The findings typically describe the dimensions of a phenomenon or behavior in terms of who, what, when, and where it occurred. However, if we want to know *whether* and *how* two or more variables change together, we need **correlational research**. As the name implies, the purpose of this approach is to determine whether any two variables are *co-related*, meaning a change in one is accompanied by a change in the other. If one variable increases, how does the other variable change? Does it increase or decrease?

[AQ4] For example, a disturbing link has been found between Instagram and psychological well-being (Sherlock & Wagstaff, 2019). For women between 18 and 35 years of age, frequency of Instagram use (see photo) was correlated with lower self-esteem, higher depressive symptoms, increased general and physical appearance anxiety, and higher body dissatisfaction. Researchers have also found a correlation between age and job satisfaction (Dobrow Riza et al., 2018). In this

alexey malkin/123RF

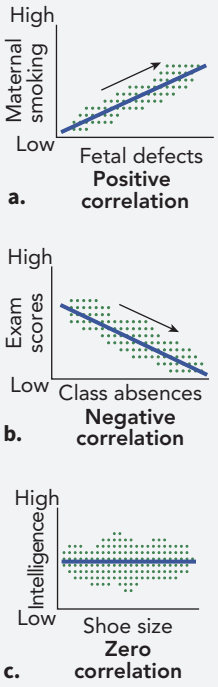
longitudinal study (research conducted over a long period), participants reported feeling less satisfied with their jobs over the years, but as they aged (and often changed jobs) their satisfaction increased. How can we explain this apparent contradictory finding? Job satisfaction appears to follow a cyclical pattern. When first employed, we go through a "honeymoon period," but our satisfaction tends to decline the longer we stay in that particular job. However, when we move on to another organization, with generally higher wages, our satisfaction increases.

As you can see, correlational research allows us to make predictions about one variable based on knowledge of another. Suppose scientists noted a relationship between hours of television viewing and performance on exams. They could then predict exam grades based on the amount of TV viewing. The researchers could also determine the direction and strength of the relationship using a statistical formula that gives a **correlation coefficient**, which is a number from –1.00 to +1.00 that indicates the direction and strength of a relationship between two variables. Understanding what all of this means is crucial to becoming an educated consumer of research. As shown in **Figure 1.11**, one clear "payoff" for understanding correlations is that it can prevent problems, such as the link between a

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

FIGURE 1.11 Interpreting a correlation coefficient

Chris Carroll/Corbis/Getty Images



Direction of the correlation	Strength of the 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)
+.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)
–.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)

Q Test Your Critical Thinking

Can you identify whether each of the following pairs most likely has a positive, 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

There are three major forms of correlation and they're often depicted in graphs called scatterplots (shown in the left column of this figure). Each dot on these graphs represents one participant's score on both variables, such as maternal smoking and fetal defects. The pattern (or "scattering") of the dots (upward, downward, or horizontal) reveals the direction of the correlation (positive, negative, or zero).

- **Direction of the correlation** (left-hand column) The + or − sign in the correlation coefficient indicates the *direction* of the correlation, either positive or negative. Note in Figure a that when two factors vary in the same direction, meaning they increase or decrease together, the correlation is called a *positive correlation*. In contrast, when two factors vary in opposite directions, one increasing as the other decreases, it's known as a *negative correlation* (Figure b). When there is NO relation between the two variables, it is called a *zero correlation* (Figure c).
- **Strength of the correlation** (right-hand column) Look again at the scatterplots in the left column, and note how the various dots cluster around the three solid dark lines. The closer the dots are together, the stronger the relationship—little scatter (more clustering) indicates a high correlation. Correlations of +1.00 and a −1.00 magnitude 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 intelligence and shoe size.

pregnant woman's use of drugs—like nicotine and alcohol—and serious birth defects (e.g., Denny et al., 2019; Maessen et al., 2019).

Limits of Correlations

Unfortunately, correlations are sometimes confusing, misleading, and sometimes not particularly useful. In addition, 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 these two major cautions concerning correlations:

1. **Correlation does NOT prove causation!** Correlational studies can detect whether or not two variables are related. However, they cannot tell us which variable is the cause or the effect—or whether other known or unknown factors may explain the mathematical relationship. As an example, studies show that cities with a higher total number of police officers have a higher crime rate. Does this mean that an increase in police officers leads to more crime? Of course not. Instead, a *third variable* (increased population) is the most logical source of the link between more officers and more crime. A similar confusion occurs with the correlational finding that sales of ice cream are higher when the rate of drownings is highest (**Figure 1.12**).

   This mistake of confusing correlation with causation is sometimes referred to as the **third-variable problem**, which identifies a situation in which a variable that has not been measured accounts for a relationship between two or more other variables. Would you like another example? See **Figure 1.13**.

2. **Correlations are sometimes illusory—meaning they don't exist.** In this second problem, there is NO factual connection between two variables; the supposed correlation is the result of random coincidence and/or misperception. Popular beliefs, such as that infertile couples are more likely to conceive after an adoption, or that certain slot machines are more likely to pay off than others, or that strange behaviors increase during a full moon, are called **illusory** (false) **correlations** (Ernst et al., 2019; Lilienfeld et al., 2015).

Third-variable problem A situation in which a variable that has not been measured affects (confounds) a relationship between two or more other variables; also known as a problem of confounding.

Illusory correlation A mistaken perception that a relationship exists between variables when no such relationship actually exists.

aslysun/Shutterstock.com

Sarocha_S/Shutterstock.com

FIGURE 1.12 Revisiting correlation versus causation Ice cream consumption and drowning are highly correlated. Obviously, eating ice cream doesn't *cause* people to drown. A third factor, such as high temperatures, increases both ice cream consumption and participation in water-based activities.

TIP Are you confused about the difference between third variables and illusory correlations? If so, note that with the *third-variable problem*, a correlation does exist between two or more variables, but a third factor might be responsible for their relationship. In contrast, with an *illusory correlation* there is NO actual connection between two variables—the apparent connection is totally FALSE.

Superstitions, such as the idea that breaking a mirror will lead to seven years of bad luck or that wearing your lucky team jacket 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 persist despite logical reasoning and scientific evidence to the contrary (**Table 1.5**).

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 potential causes of behavior. For example, focusing attention on the dramatic (but very rare) instances when infertile couples conceive after adoption or when a gambler wins a large payout are both examples of illusory correlations, as well as what is called the *saliency bias* (see Chapter 15). We also more often note and remember events that confirm our expectations and ignore the "misses." This is known as the *confirmation bias* (Chapter 8).

The important thing to remember while reading research reports in the media or any textbook 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, which is discussed in the next section.

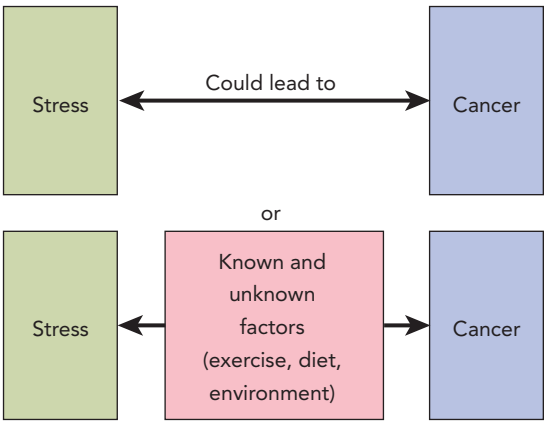
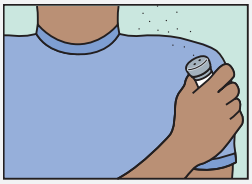
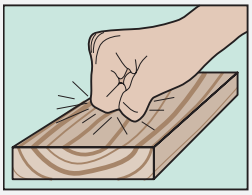


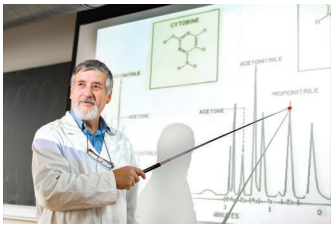
FIGURE 1.13 Correlation versus causation—The third-variable problem Research has found a strong correlation between stress and cancer (Chapter 3). However, this correlation does not tell us whether stress causes cancer, whether cancer causes stress, or whether other known and unknown factors, such as smoking, drinking, or poverty, 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?

TABLE 1.5 Superstitions 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. If someone spilled salt, it supposedly meant that a guardian spirit had caused the accident to warn him or her of evil nearby. At the time, salt was scarce and precious. Therefore, the person was advised to bribe the bad spirits with a pinch of salt thrown over his or her 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.

The Value of Correlations

After discussing the limits of correlational research, it's important to point out that this research method is still incredibly valuable, offering at least three major advantages:



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1. **Prediction** A correlation can tell us if a relationship exists between two variables, allowing us to use one variable to predict scores on another. **[AQ5]** Consider the findings of a positive correlation between years of education and health outcomes—see photo (e.g., Frakt, 2019). This correlation means that we can successfully predict that, as your educational level increases, your overall health and life expectancy will also increase. In fact, the age-adjusted mortality rate of high school dropouts ages 25–64 is more than twice that of those with some college (Cutler & Lleras-Muney, 2006; Picker, 2016). This large and persistent correlation between education and health has been observed many times and in many countries. Although there are several possible explanations for this finding, researchers in this area suggest the results are most likely due to better access to health care among the more highly educated, along with improved thinking and decision-making patterns. (Keep this correlation in mind if someone questions you about why you're going to college.)
2. **Real-world settings** A second value to correlational studies is that, like descriptive studies, they can be conducted in real-world settings to examine relationships that would otherwise be impossible or unethical to study. As mentioned earlier, smoking cigarettes and drinking alcohol while pregnant are highly correlated with birth defects and other poor birth outcomes, and conducting experiments on pregnant women with cigarettes and alcohol would obviously be immoral and illegal. Fortunately, evidence from this strong correlation, along with other research, has helped convince many women to avoid these harmful substances while pregnant—likely preventing many birth defects. Similarly, correlational findings that drunk driving and distracted driving are highly linked with serious and fatal car accidents have led to strict laws that have reduced these practices.

   On a lighter note, research described in Chapter 3 validates a long-suspected link between high stress levels and reduced odds of conception (Akhter et al., 2016). Do you recognize how this type of correlational data offers encouraging news and pleasant options for those trying to conceive—like taking a vacation?

These real-world correlations offer other practical applications. For instance, many parents, professionals, and researchers (mentioned earlier) have repeatedly expressed concerns about the potential ill effects of Facebook and other social media sites on young people. However, when 12 million Facebook users were compared to non-users, researchers found that people with moderate levels of online social interaction and high levels of offline social interaction actually have a lower short-term mortality risk (Hobbs et al., 2016). Research has long showed that people who have strong social networks live longer, but this is the first large-scale study showing that online relationships may be good for our mental and physical health—when used in moderation.

3. **Directions for future research** Correlational research, like descriptive studies, offers data and ideas for future research. Even though correlation does NOT prove causation, it can point to *possible* causation, which can then become the subject of later experiments (which can prove causation)—the topic of our next section.

Experimental Research

As you've just seen, both descriptive and correlational studies are important because they reveal important data, insights, and practical applications. However, to determine *causation* (what causes what), we need **experimental research**. This method is considered the "gold standard" for scientific research because only through an **experiment** can researchers manipulate and control variables to determine cause and effect.

If you've ever followed a recipe to cook a new dish or tried various methods of dating to see what works best, you're already familiar with the basics of an *experiment*. You manipulated and controlled the variables and then noticed the cause and effect of your efforts. Now, to further help you understand all the important key terms and the general set-up for an experiment, imagine yourself as a psychologist interested in determining how texting while driving a car might affect the number of traffic accidents.

You begin by reviewing the very simple experimental set-up in **Process Diagram 1.2**. Your first task is to develop your *hypothesis* (Step 1), which we defined earlier as a tentative and testable explanation about the relationship between two or more variables.

Next, you solicit volunteers for your experiment (Step 2). To minimize critical differences between participants, you'll need to avoid **sample bias**, which occurs when the researcher recruits and selects individuals who do not accurately reflect the composition of the larger population from which they are drawn. Interestingly, some critics suggest that psychological literature is biased because it too often uses college students as participants. Psychologists counteract potential sample bias by selecting participants who constitute a **random sample** of the entire population of interest, which allows each member of that group an equal chance of being selected.

After randomly sampling, it's important to randomly assign participants to one or more research group(s)—either the **experimental group** or the **control group**—using chance procedures (such as a coin toss or a random numbers table). As defined earlier, random assignment helps ensure that all participants have an equal opportunity to be in either group. Note that having at least two groups allows the performance of one group to be compared with that of another.

Then, both the experimental group and the control group will be assigned to a driving simulator (Step 3). Participants assigned to the *experimental group* receive one level of the **independent variable (IV)**, which is the treatment under study, and the variable being manipulated by you—the experimenter. Those assigned to the *control group* will be treated in every way just like the experimental group. The only difference is that they will NOT text while driving.

In Step 4, while all participants drive for a given amount of time (e.g., 30 minutes in the driving simulator), you, the experimenter, will record the number of simulated traffic accidents—the **dependent variable (DV)**. Note that the goal of any experiment is to learn how the dependent variable is *affected by* (depends on) the independent variable.

Experimental research A type of research that involves the manipulation and control of variables to determine cause and effect; designed to meet the goal of *explanation*.

Experiment A careful manipulation of one or more independent variables to measure their effect on other dependent variables; allows the determination of cause-and-effect relationships.

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

Random sample A sample that allows each member of the population of interest an equal chance of being selected.

Experimental group The group that is manipulated (i.e., receives treatment) in an experiment; participants who are exposed to the independent variable (IV).

Control group The group that is not manipulated (i.e., receives no treatment) during an experiment; participants who are NOT exposed to the independent variable (IV).

Independent variable (IV) The variable that is manipulated and controlled by the experimenter 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.

STOP! This Process Diagram contains essential information NOT found elsewhere in the text, which is likely to appear on quizzes and exams. Be sure to study it CAREFULLY.

PROCESS 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, you, as the imaginary experimenter, will be examining whether people texting on phones while driving have more traffic accidents than those who don't text while driving.

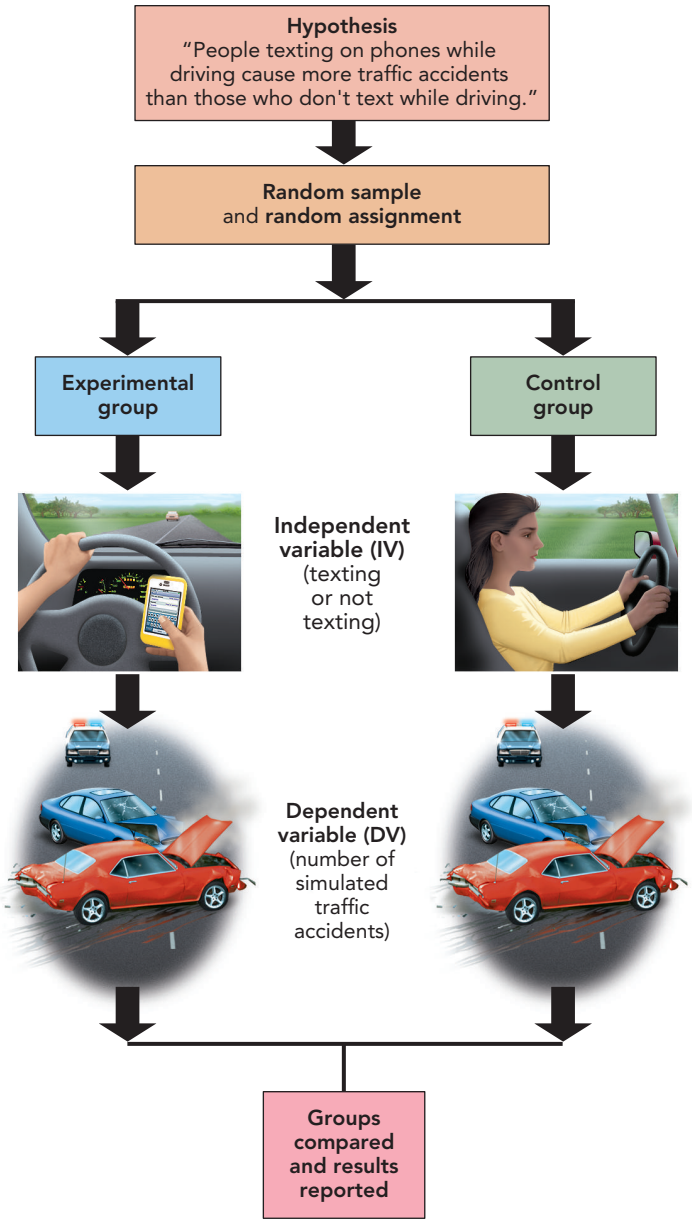
Step 1 The experimenter begins by identifying the hypothesis.

Step 2 Next, the experimenter solicits volunteers for the experiment. In order to avoid sample bias, the experimenter first attempts to select a random sample of the entire population of interest. Then, the experimenter randomly assigns these participants to two different groups—either the experimental group, which receives the treatment, or the control group, which does not receive the treatment. Having two groups allows a baseline comparison of responses between the two groups.

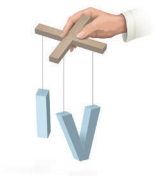
Step 3 Both the experimental and the control groups are assigned to a driving simulator. The experimental group then texts while driving, whereas the control group does not text. Texting or not texting are the two levels of the independent variable (IV).

Step 4 The experimenter counts the number of simulated traffic accidents for each group and then analyzes the data. The number of simulated traffic accidents is the dependent variable (DV). [Note that the DV is called "dependent" because the behavior (or outcome) exhibited by the participants is assumed to *depend* on manipulations of the IV.]

Step 5 If the differences between the two groups are statistically significant, the experimenter writes up his or her report and submits it to scientific journals for possible publication.



TIP Are you confused about the difference between independent and dependent variables (IV and DV)?
If so, carefully study the "puppet" and "ruler" illustrations, which help illustrate the differences, while also creating a lasting 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.

Finally, in Step 5, you'll compare the results from both groups. If the differences are significant, you may want to report your findings to a peer-reviewed scientific journal like the ones found in the References section provided at the end of this text. Keep in mind that because the control group was treated exactly like the experimental group, except for the differing levels of the IV, any significant difference in the number of traffic accidents (the DV) between the two groups would be the result of the level 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.

Take-Home Message Research clearly shows that phone use, particularly texting, while driving leads to increased accidents, and potentially serious or fatal consequences (e.g., Federal Communications Commission, 2019; National Highway Traffic Safety Administration, 2019). In other words: "Let's all just put down our phones and drive."

General Research Problems and Safeguards

As you've seen, descriptive, correlational, and experimental research methods are valuable sources of scientific information, but they also have serious limits and potential biases. To offset these problems, researchers have created several safeguards to protect against potential sources of error on the part of both the researcher and the participants.

Potential Researcher Issues

In addition to the potential biases mentioned earlier (e.g., sample bias and lack of random assignment), during experiments the researcher must be aware of and control for extraneous **confounding variables** (such as time of day, lighting conditions, and room temperature). These variables must be held constant across both experimental and control groups. Otherwise, these variables might contaminate (or confound) the research results (**Figure 1.14**).

Researchers also need to be alert for signs of their own personal beliefs and expectations. Imagine what might happen if an experimenter inadvertently breathed a sigh of relief when a participant gave a response that supported the researcher's hypothesis. This type of behavior, known as **experimenter bias**, can easily influence the research results in the experimenter's expected direction. A closely related type of bias, **demand characteristics**, refers to any aspect of a study that unknowingly communicates to the participants how the experimenter wants them to behave. Rather than influencing the results in an expected direction (experimenter bias), the researcher, or subtle cues or signals within the study, create an implicit *demand* for how participants should behave.

A good example of both experimenter bias and demand characteristics is provided by the case of *Clever Hans*, the famous mathematical "wonder horse"(**Figure 1.15**). One way to prevent such biases 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.

Experimenters can also skew their results if they assume that behaviors typical in their own culture are typical of 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 participants from their own culture and once with participants from at least one other culture. This kind of *cross-cultural sampling* isolates group differences in behavior that might stem from any researcher's personal ethnocentrism.

Confounding variable An extraneous factor that, if not held constant, may contaminate, or confound, the experimental results; also known as the third-variable problem in correlational research.

Experimenter bias A problem that occurs when the experimenter's behavior and/or expectations inadvertently influence (bias) the outcome of the research.

Demand characteristics Any aspect of a study that unknowingly communicates to participants how the experimenter wants them to behave; either the researcher or subtle cues or signals within the study, create an implicit *demand* for how participants should behave.

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.

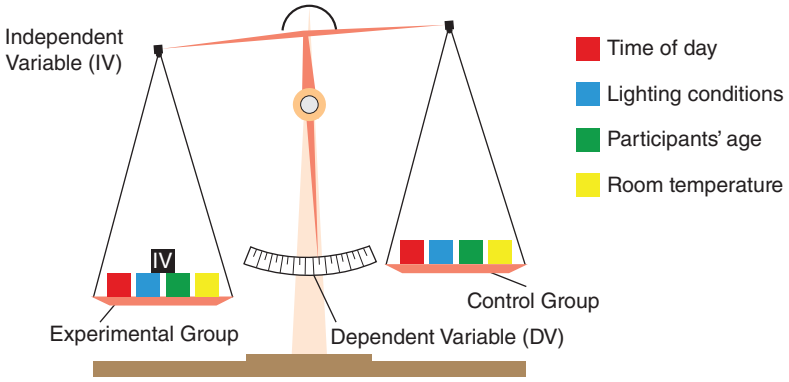


FIGURE 1.14 Controlling for confounding variables Recognizing that certain extraneous variables, like time of day, lighting conditions, etc., may affect their experimental findings, researchers work to make sure the variables are the same for both the experimental group and the control group. Once a particular level of 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, start over, or go on to a new project.

Martha Lazar/The Image Bank/Getty Images

FIGURE 1.15 Can a horse add, multiply, and divide? Clever Hans and his owner, Mr. Von Osten, convinced many people that this was indeed the case (Rosenthal, 1965). When asked to multiply 6 times 8, minus 42, Hans 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. Can you see how this provided an early example of both experimenter bias and demand characteristics?

Galina Khrutskaia/Shutterstock.com

FIGURE 1.16 Participant bias and co-sleeping with pets Research shows that a little over half of all pet owners share their bed with their pets, with about 40 percent reporting that it helps or doesn't significantly interfere with their sleep (Krahn et al., 2015). Interestingly, the researchers noted that pet owners appeared eager to report their sleeping arrangements but reluctant to reveal any undesirable consequences. Can you see how this type of potential participant bias might unintentionally affect research results?

Participant bias A problem that occurs when a research participant's behavior and/or expectations inadvertently influence (bias) the outcome of the research.

Potential Participant Issues

An error similar to researcher bias but produced by participants is called **participant bias**. It may arise if researchers use surveys as their main research method. When participants are asked to self-report on sensitive topics, such as their sexual behaviors, alcohol and other drug consumption, or even their sleeping arrangements with pets, they often distort their own behaviors (**Figure 1.16**).

How do researchers deal with this type of participant bias, also known as *social-desirability bias*? One way is to offer anonymous participation, along with guarantees of privacy and confidentiality. When necessary, researchers can temporarily deceive participants about the true nature of the research project. Obviously, this is a controversial approach, but there are times when it's necessary. 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.

Single-blind study An experimental technique in which only the participants are unaware of (blind to) who is in the experimental and control groups.

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

Placebo An inactive substance or fake treatment used as a control technique in experiments; often used in drug research.

Additional Research Safeguards

So far we've discussed several researcher and participant issues, along with methods for preventing these problems and protecting the integrity of any experiment. Now we'd like to offer a few additional safeguards, which are actually some of the best-known, but most-often confused, types of research controls. We saved them for here because they're designed to minimize both experimenter and participant issues.

Let's begin with **single-blind** and **double-blind studies**. As you can see in **Figure 1.17**, this approach requires experimenters to keep themselves and/or their participants blind to (unaware of) of the treatment or condition to which the participants have been assigned.

Imagine yourself in an experiment in which you are told that the pill you're taking for eight 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, this means that if you were a participant you wouldn't know if you were being given the actual, experimental drug or an inactive **placebo** pill that had no physiological effects. 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.

Quasi-Experimental Design

Given the numerous limits to and problems with the experimental method, some researchers turn to alternative methods called *quasi-experimental designs*. The prefix *quasi-* means "sort of," and in this case the research looks sort of like a true experiment. But it lacks a key ingredient—*random assignment to groups*—because in many situations random assignment is impossible or unethical. Imagine that you wanted to study how a father's later attachment to his child was affected by his presence or absence at that child's birth. You obviously could not randomly assign fathers to either the present-at-birth condition or the absent-at-birth condition.

Knowing that assessing the differences between the two groups still might provide important information, experimenters can compare the two groups without random assignment, and the research method would then be a quasi-experimental design. Why can't these designs make the same strong claims for causation that can be made based on true experiments? Without random assignment, uncontrolled third variables might skew the results.

Summing Up

Recognizing that we've offered a large number of research problems and safeguards associated with the various research methods (descriptive, correlational, and experimental), we've gathered them all into **Figure 1.18**. Be sure to study it carefully.

Given all these problems, should we simply pack our bags and go home? Of course not. As you can see in **Table 1.6**, there are advantages and disadvantages to each method, and psychological research does have its limits. Nevertheless, having a general understanding of research methods will help guide you through the often conflicting claims made in newspapers, in television ads, and by our friends and neighbors. Research findings have also offered solutions to practical problems, led us to significant improvements in our personal and interpersonal lives, and provided invaluable guidelines that will help us make more informed decisions. If you'd like additional information about research methods and statistical analyses, see Appendix A. Note also that each chapter of this text offers an in-depth analysis of a hot topic in research, along with its own, built-in, self-grading quiz (see the following **RC Research Challenge**).

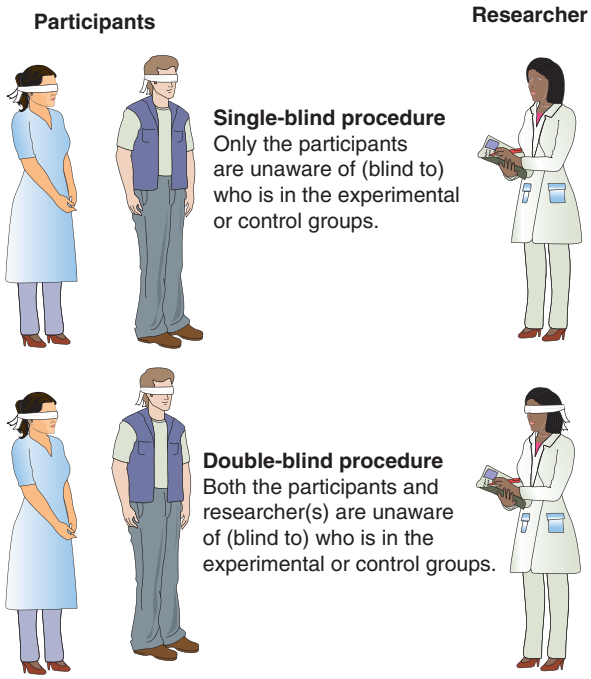


FIGURE 1.17 A single- or double-blind experimental design To scientifically evaluate the effectiveness of something like a new drug, researchers administering the experimental drug, and the participants taking the drug, must be unaware of (or "blind" to) who is receiving a *placebo* (a fake pill), and who is receiving the drug itself. Placebos are necessary because researchers know that participants' beliefs and expectations can change their responses and the experimental outcome—the so-called "placebo effect" (Leibowitz et al., 2019; Yanes et al., 2019).

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

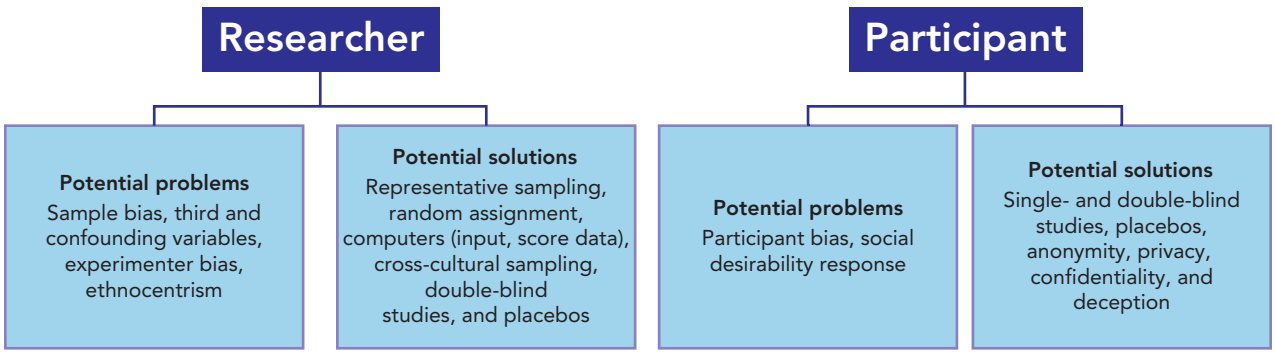
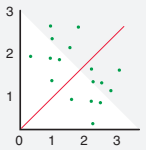


FIGURE 1.18 Potential research problems and solutions

TABLE 1.6 Psychology's Three Major Research Methods

Method	Purpose	Advantages	Disadvantages	
Descriptive (observation, survey/interview, 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	Little or no control over variables, potential biases, cannot identify cause and effect	
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)	Allows prediction and helps clarify relationships between variables that cannot be examined by other methods	Little or no control over variables, cannot identify cause and effect, possible illusory correlation and third-variable problem, and potential biases	
Experimental (manipulation and control of variables)	Identify cause and effect (meets psychology's goal of explanation)	Allows researchers more 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	

RC Scientific Thinking: Research Challenge

Is Happiness Defined by Your Social Class?

(APA Goal 2.4) Interpret, design, and conduct basic psychological research

Earlier in this chapter, we discussed research in positive psychology showing that once we have enough income to meet our basic needs, additional funds won't significantly increase our levels of happiness. In short, money doesn't buy happiness. However, now that you've studied the basics of psychological research and are applying your scientific and critical thinking skills, do you wonder how happiness was identified and defined? Researchers interested in the emotional components of happiness, and how these components might vary among people in different socioeconomic classes, recruited a large nationally representative U.S. sample of 1,519 individuals (Piff & Moskowitz, 2018). Participants were asked to self-report on their tendencies to experience seven different positive emotions that are core to happiness—amusement, awe, compassion, contentment, enthusiasm, love, and pride.

Can you predict their findings? Interestingly, wealthier participants (as measured by household income) were more likely to report *self-focused* emotions, such as amusement, contentment, and pride. Conversely, the lower social class participants reported more *other-oriented* emotions, like compassion and love. There were no class differences in enthusiasm.

How would you explain the results? The researchers suggested that the class differences may reflect varying social concerns and priorities of the higher versus lower social classes. The self-oriented feelings of the upper-class participants may result from their specific upbringing and desires for independence and self-sufficiency. In contrast, the other-oriented emotions of the lower-class may follow from growing up in more threatening environments, which possibly led to a greater desire for compassion, love, and more interdependent bonds. What do you think? Given that you may be attending college hoping to secure a high-paying job, how can you apply this research to your own career and relationship aspirations?

Identify the Research Method

1. Based on the information provided, did this study (Piff & Moskowitz, 2018) use descriptive, correlational, and/or experimental research?
2. If you chose:
   - *descriptive research*, is this a naturalistic or laboratory observation, survey/interview, case study, and/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. (Note: If participants were not randomly assigned to groups, list the design as *quasi-experimental*.)
   - both *descriptive* and *correlational*, answer the corresponding questions for both.

Check your answers by clicking on the answer button or by looking 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 provided, will help you become a better scientific and critical thinker and consumer of scientific research.

Retrieval Practice 1.3 | Psychology's Research Methods

Self-Test Completing this self-test, and then checking your answers by clicking on the answer button or by looking in Appendix B, will provide immediate feedback and helpful practice for exams.

1. When a researcher observes or measures two or more variables to find relationships between them, without directly manipulating them or implying a causal relationship, he or she is conducting _____ .
   - **a.** experimental research
   - **c.** non-causal metrics
   - **b.** a correlational study
   - **d.** a meta-analysis
2. When participants are not exposed to any amount or level of the independent variable, they are members of the _____ group.
   - **a.** control
   - **b.** experimental
   - **c.** observation
   - **d.** out-of-control
3. If researchers gave participants varying amounts of a new memory drug and then gave them a story to read and measured their scores on a quiz, the _____ would be the IV, and the _____ would be the DV.
   - **a.** response to the drug; amount of the drug
   - **b.** experimental group; control group
   - **c.** amount of the drug; quiz scores
   - **d.** researcher variables; extraneous variables
4. When both the researcher and the participants are unaware of who is in the experimental or control group, the research design can be called _____ .
   - **a.** agnostic
   - **b.** double-blind
   - **c.** valid
   - **d.** quasi-experimental

Q Test Your Critical Thinking

1. Which form of research would you most trust: descriptive, correlational, experimental, or a meta-analysis? Why?
2. Cigarette companies have suggested that there is no scientific evidence that smoking causes lung cancer. How would you refute this claim?

Real World Application Questions

[AQ4] Does spending more time on Instagram decrease your psychological well-being?

alexey malkin/123RF

[AQ5] Is there a correlation between years of education and physical health?

lightpoet/123RF

Hint: Look in the text for **[AQ4]** and **[AQ5]**

1.4 Secrets of Student Success

LEARNING OBJECTIVES

Retrieval Practice While reading the upcoming sections, respond to each Learning Objective in your own words.

Review the key strategies for student success.

- **Describe** the four steps you can take to improve your study habits.
- **Discuss** ways to improve your time management.
- **Identify** the key factors in grade improvement.

Real World Application Question

[AQ6] What are the best study techniques for improving your exam performance?

In this closing section, you will find several important, well-documented study tips and techniques guaranteed to make you a more efficient and successful college student. In fact, an experiment with randomly assigned college students found that the group of students who were asked to self-reflect and to identify and use learning resources wisely improved

their class performance by an average of one-third of a letter grade compared to the group that did not self-reflect (Chen et al., 2017). For an example of this type of self-reflection, and an overview of the major topics in this section, be sure to **Test Yourself** by completing the following checklist.

PA Practical Application

Test Yourself: Student Success Checklist

Answer true or false to each item. Then for each item that you answered "True," pay particular attention to the corresponding heading in this *Secrets of Student Success* section.

Study Habits

_____ **1.** While reading, I often get lost in all the details and can't pick out the most important points.

_____ **2.** When I finish studying a chapter, I frequently can't remember what I've just read.

_____ **3.** I generally study with either the TV or music playing in the background.

_____ **4.** I tend to read each section of a chapter at the same speed, instead of slowing down on the difficult sections.

Time Management

_____ **5.** I can't keep up with my reading assignments given all the other demands on my time (see photo).

_____ **6.** I typically wait to study, and then "cram" right before a test.

_____ **7.** I go to almost all my classes, but I generally don't take notes and often find myself texting, playing games on my computer, or daydreaming.

Freddy Cahyono/123RF

Grade Improvement

_____ **8.** I study and read ahead of time, but during a test I frequently find that my mind goes blank.

_____ **9.** Although I study and read before tests and think I'll do well, I often find that the exam questions are much harder than I expected.

_____ **10.** I wish I could perform better on tests and read faster or more efficiently.

_____ **11.** Going to class is a waste of time.

_____ **12.** I just can't do well on tests.

Study Habits

If you answered "True" to one or more of questions 1–4, try these four ways to improve your study habits and to more successfully read (and remember) information in this and most other texts:

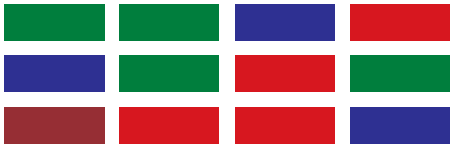
1. **Familiarization** The first step to good study habits is to familiarize yourself with the text so that you can take full advantage of its contents. Scanning through the Chapter Outline will give you a bird's-eye view of each chapter. Also, be sure to note the various tables, figures, photographs, and special feature boxes, all of which will enhance your understanding of the chapter content.
2. **Active Reading** The next step is to make a conscious decision to *actively* read and learn the material (Putnam et al., 2016). Reading a text is *not* like reading a novel or fun articles on the Internet. You must tell your brain to slow down, focus on details, and save the material for future recall (see the **Test Yourself**).

SQ4R method A study technique based on six steps: Survey, Question, Read, Recite, Review, and wRite.

Perhaps the most effective way to practice reading actively is to use the **SQ4R method**, which was developed by Francis Robinson (1970). The initials stand for six steps in effective reading: Survey, Question, Read, Recite, Review, and wRite (**Process Diagram 1.3**). Taking notes (wRite) while you're reading and studying can be particularly helpful. Ask yourself, "What is the

PA Practical Application

Test Yourself: Demonstrating the Importance of Active Reading



a. Using a stopwatch, test to see how fast you can name the color of each rectangular box.

GREEN RED BROWN RED
BROWN GREEN GREEN BLUE
GREEN BROWN RED BLUE

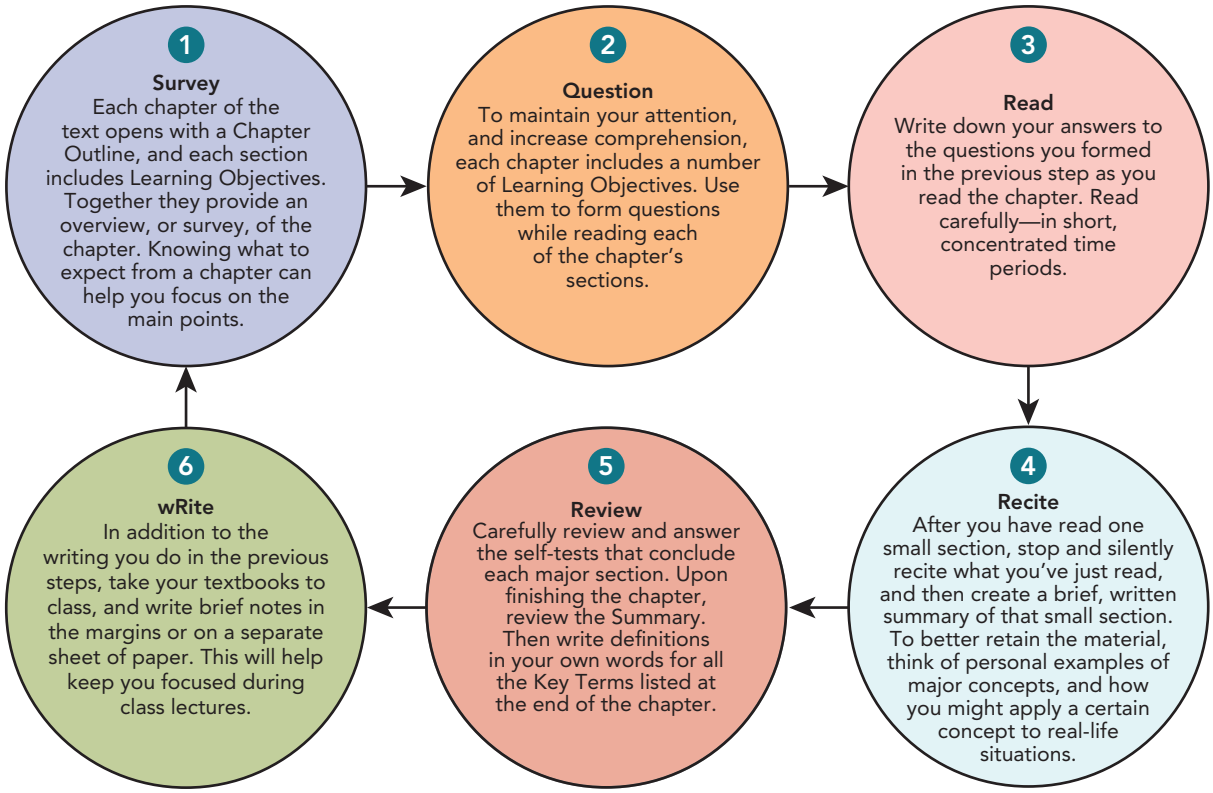
b. Now, time yourself to see how fast you can state the color of ink used to print each word, ignoring what each word says.

After timing yourself on both tasks, how did you do? Interestingly, young children who have learned their colors, but have not yet learned to read, easily name the colors in both sections in about the same amount of time. However, virtually every adult takes more time, and makes more errors on (b) than on (a). This is because, over time, our well-learned ability to read words has become a *passive* task, which interferes with the less common *active* task of naming the color rather than the words.

We include this demonstration, known as the *Stroop effect*, here because it helps illustrate the importance of active reading. If you passively read a chapter in a text once, or even several times, you'll still do poorly on an exam. Just as it takes more time to state the color in part (b), it will take you more time and effort to override your well-learned passive reading, and focus on the details to truly learn and master the material.

STOP! This Process Diagram contains essential information NOT found elsewhere in the text, which is likely to appear on quizzes and exams. Be sure to study it CAREFULLY.

PROCESS DIAGRAM 1.3 **Using the SQ4R Method** Follow these steps to improve your reading efficiency.



main idea?" Then write down key ideas and supporting details and examples. As you might have guessed, this text was designed to incorporate each of the six steps in the SQ4R method.

3. **Avoid highlighting and rereading** Marking with a yellow highlighter, or underlining potentially important portions of material, and rereading text material after initial reading,

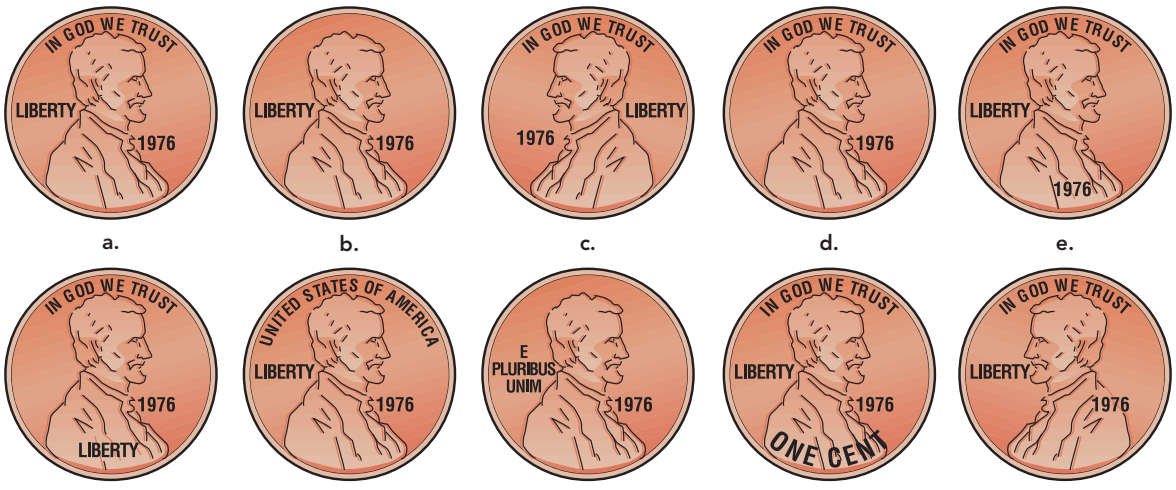
are common techniques students frequently use while studying. Unfortunately, they are almost always a waste of time. Research clearly shows that highlighting and rereading are among the LEAST effective of all the major study techniques, whereas *distributed practice* and *practice testing* (explained later in the grade improvement section) are the MOST effective. As previously discussed, you need to actively focus on your reading. Highlighting and rereading generally encourage passive reading.

4. **Overlearn** Many students tend to study new material just to the point where they can recite the information, without attempting to understand it more deeply. For best results, however, you should overlearn. In other words, be sure you fully understand how key terms and concepts are related to one another and can generate examples other than the ones in the text. Overlearning also involves carefully reviewing the material (by visualizing the phenomena that are described and explained in the text and by rehearsing what you have learned) until the information is firmly locked in place. This is particularly important if you suffer from test anxiety. Would you like a quick demonstration of why we sometimes need to overlearn? See the following **Test Yourself**.

PA Practical Application

Test Yourself: Demonstrating the Importance of Overlearning

Can you identify which one of these 10 pennies is an exact duplicate of a real U.S. penny? Unless you're a coin collector, you probably can't easily choose the correct one without comparing it to a real coin—despite having seen thousands of pennies. Why? As you will discover later in the text (Chapter 7), you must encode (or process) the information in some way before it will be successfully stored in your long-term memory. Given that most of us don't need to carefully study and overlearn the details of what a penny looks like, because we can function in our everyday world with a superficial glance at the coin, why are we providing this demo? The point is that if you're going to take a test on pennies, or any material, you need to carefully study to the point of overlearning in order to do well.



Answer: Coin a is the duplicate of a real penny

Time Management

If you answered "True" to one or more of the questions 5–7 in the Student Success Checklist at the start of this section, and find that you aren't always good at budgeting your time, here are four basic time-management strategies:

- **Establish a baseline.** Before attempting any changes, simply record your day-to-day activities for one to two weeks (see the sample in **Figure 1.19**). You may be surprised at how you spend your time.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:00		Breakfast		Breakfast		Breakfast	
8:00		History	Breakfast	History	Breakfast	History	
9:00		Psychology	Statistics	Psychology	Statistics	Psychology	
10:00		Review History and Psychology	Campus Job	Review History and Psychology	Statistics Lab	Review History and Psychology	
11:00		Biology		Biology		Biology	
12:00		Lunch / Study		Exercise	Lunch	Exercise	
1:00		Bio Lab	Lunch	Lunch	Study	Lunch	
2:00			Study	Study			

FIGURE 1.19 **Sample record of daily activities** To help manage your time, draw a grid similar to this, and record your daily activities in appropriate boxes. Then fill in other necessities, such as daily maintenance tasks and downtime.

- **Set up a realistic schedule.** Make a daily and weekly "to do" list, including all required activities, basic maintenance tasks (like laundry, cooking, child care, and eating), and a reasonable amount of downtime. Then create a daily schedule of activities that includes time for each of these. To make permanent time-management changes, shape your behavior, starting with small changes and building on them.
- **Reward yourself.** Give yourself immediate, tangible rewards for sticking with your daily schedule, such as calling a friend, getting a snack, or checking your social media.
- **Maximize your time.** To increase your efficiency, begin by paying close attention to the amount of time you spend on true, focused studying versus the time you waste worrying, complaining, and fiddling around getting ready to study ("fretting and prepping").

Time experts point out that people often overlook important *time opportunities*—spare moments that normally go to waste that you might use productively. When you use public transportation, review notes or read your textbook. While waiting for doctor or dental appointments or to pick up your kids after school, take out your text or electronic device and study for 10 to 20 minutes. Hidden moments count. See the following **PAH Practical Application Highlight** for a general overview and specific techniques for improving your grades and furthering your student success.

Final Take-Home Message

Success in college, and in virtually all parts of life, is within your control. Given that you've read this *Secrets of Student Success* section, we're confident that you will do well. Our final tip is to *write out your goals* for success in this course and all other important parts of your life. Research shows that making a habit of writing down your goals definitely leads to higher performance (Murphy, 2018; Stringer, 2017; van der Hoek et al., 2018). Why? The writing process helps us focus on relevant versus irrelevant activities, while increasing our effort and persistence.

PAH Practical Application Highlight

Tips for Grade Improvement

(APA Goal 1.3) Describe applications of psychology

In combination with the previous study habit and time management tips, the following strategies are virtually guaranteed to improve your overall grade point average (GPA) in all your college classes and your mastery of the material.

1. **Refuse to multitask on new or complex material.** Are you one of the many students who believe that doing more than one task at a time makes you more effective? If so, you'll be surprised to know that this so-called "multitasking" is actually just "task-switching," and that it clearly decreases overall performance and productivity—particularly for new or complex tasks (Aagaard, 2019; Bender et al., 2017; Ralph et al., 2019). As you discovered earlier in the section on active reading and the *Test Yourself* Stroop test, switching from one task to another (reading a word while trying to state its color) greatly increased your response time—and errors.

   Can you see how this explains why texting and driving (or walking) is so dangerous (Chapter 5), and how casually listening to the professor, while also texting, playing computer games, or talking to other classmates, is largely a waste of time? In fact, astudy in an introductory psychology class found that Internet use during lectures was *negatively correlated* with student performance, which means, as you learned earlier in this chapter, that as Internet usage went up performance went down (Ravizza et al., 2017). A good rule to remember is that one hour of full attention in class is generally worth about four hours on your own outside of class. In addition to paying full attention, taking detailed notes by hand versus a laptop during each class session is one of the most efficient and profitable uses of your time (Mueller & Oppenheimer, 2014).

2. **Maximize the value of each class session.** As you know, the authors of this text are both college professors, so this advice may sound biased. However, solid psychological research (e.g., Putnam et al., 2016) recommends that all students do the following:

   - **Prepare ahead of time.** Be sure to study the assigned material ahead of each class.
   - **Attend every class.** Most instructors provide unique ideas and personal examples that are not in the text, and even when they do repeat what is covered in the text, we all need to have multiple exposures to new material. Also, pay close attention to what your professor emphasizes in class, as this material is likely to appear on exams. Think of your professor's lecture as you would tips from your coach or an employer who was going out of his or her way to tell you what you needed to know to maximize your performance or paycheck.

3. **Improve your general test-taking skills.** Virtually all students can improve their performance on exams by taking additional courses designed to develop their reading speed and comprehension. During exams, expect a bit of stress but don't panic. Pace yourself and focus on what you know. Skip over questions when you don't know the answers, and then go back if time allows. On multiple-choice exams, carefully read each question and all the alternative answers, before responding. Answer all questions and make sure you have recorded your answers correctly.

   Also, bear in mind that information relevant to one question is often found in another test question. Do not hesitate to change an answer if you get more information—or even if you simply have a better guess about an answer. Contrary to the belief held by many students (and faculty) that "your first hunch is your best guess," research suggests this is NOT the case (Benjamin et al., 1984; Lilienfeld et al., 2010, 2015). Changing answers is far more likely to result in a higher score (**Figure 1.20**).

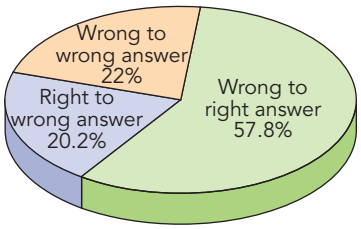


FIGURE 1.20 Should you change your answers? Research clearly shows that answer changes that go from a wrong to a right answer (57.8 percent) greatly outnumber those that go from a right to a wrong answer (20.2 percent).

Source: Benjamin et al., 1984.

4. **[AQ6] Distribute your practice and practice test taking.** Research has firmly established that these last two techniques—*distributed practice* and *practice testing*—are the MOST important keys to grade improvement—see photo (Carpenter & Yeung, 2017; Gagnon & Cormier, 2018; Trumbo et al., 2016). Why? Spreading your study sessions out over time (distributed practice) and practice testing are far more efficient than waiting until right before an exam and cramming in all the information at once (massed practice) (Chapter 7). If you were a basketball player, you wouldn't wait until the night before a big play-off game to practice. Just as you need to repeatedly practice your free throw shot to become a good basketball player, you need to repeatedly practice your test-taking to become a good student.

Olga_Danylenko/iStock/Getty Images

   Based on this growing body of research and our own teaching success with frequent testing, we've designed this text to include numerous, distributed practice opportunities sprinkled throughout each chapter. As you're actively reading and studying, be sure to complete all these self-tests. When you miss a question, it's very helpful, and important, to immediately go back and reread the sections of the text that correspond to your incorrect response. You can also easily access the free flashcards and other forms of self-testing provided with the purchase of this text.

5. **Adjust your attitude.** We've saved our best tip—*attitude adjustment*—for last. You have the power to decide that you can, and will, improve your academic skills. Instead of focusing on negative thoughts, such as "I can't go to the party because I have to study" or "Going to class feels like a waste of time," try counter statements, like "I'm going to learn how to study and make better use of my class time, so that I can have more free time." Similarly, rather than thinking or saying "I never do well on tests," do something constructive like taking a study skills and/or test preparation course at your college.