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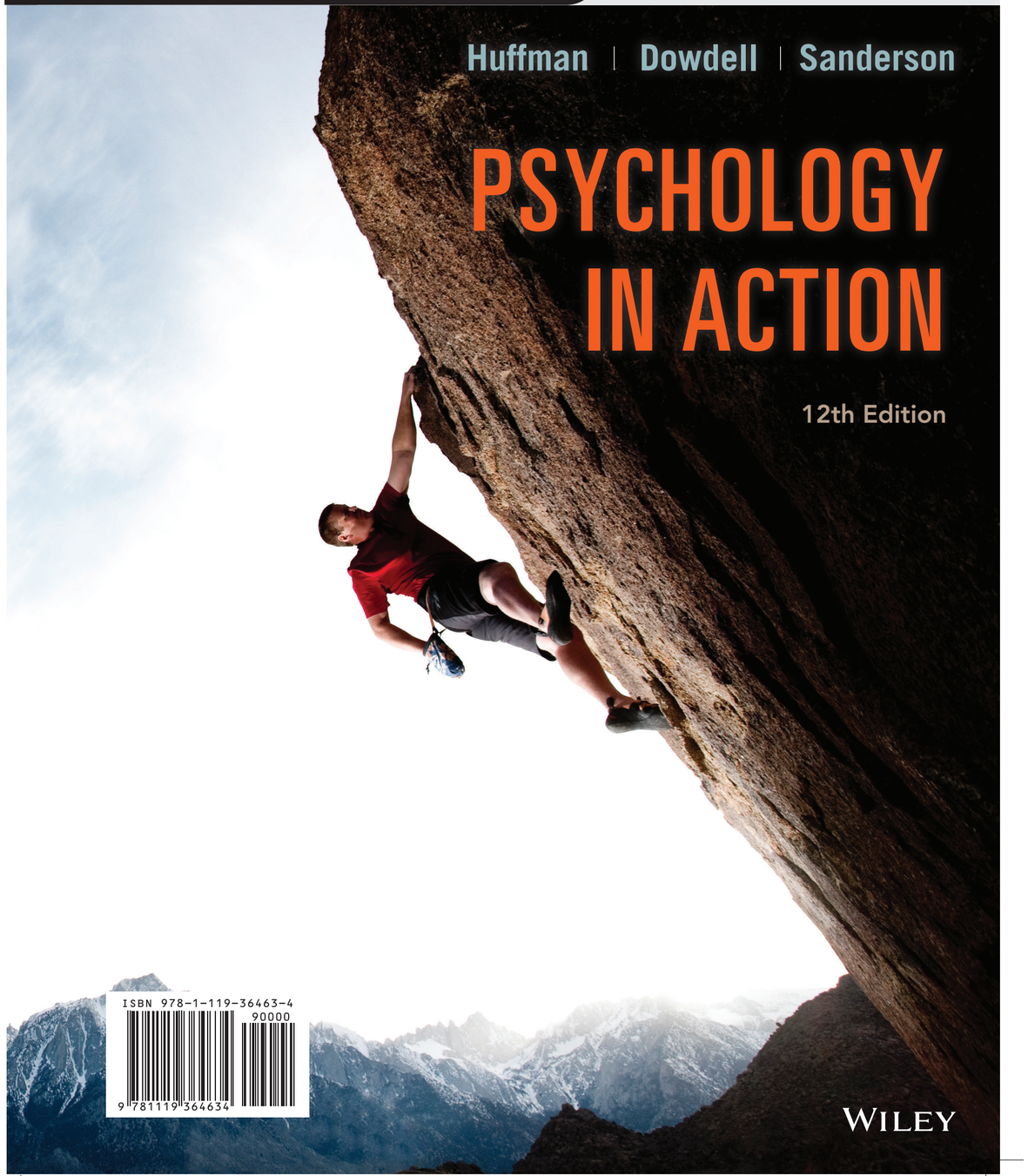

Huffman | Dowdell | Sanderson

PSYCHOLOGY IN ACTION

12th Edition

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Psychology in Action

12th Edition

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Preface


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What do you think about the death-defying mountain climber on the cover of this text? Most readers don't recognize the time and thought authors and publishers commit to visually capturing the essential message of their work. In our case, we've always chosen activity-oriented images for all twelve editions of *Psychology in Action* because, as its name implies, our textbook has earned its reputation as a leader in *active learning.*

Beginning with our first edition, we were the first to include *Try This Yourself* activities*, Study Tips, Research Challenges*, and other "hands on" demonstrations (e.g., *Critical Thinking Exercises* and *Media Challenges* that are available as graded assignments in the WileyPlus program). Why? We've always believed that student success is best assured through active learning, which encourages students to think critically and engage with the material—thus leading to deeper levels of processing. Our enduring foundation in active learning continues in this twelfth edition—as shown in the following examples.

What's **NEW** in *Psychology in Action* 12e? Given our commitment to active learning and evidence-based research, we've chosen to make the development of a *growth mindset* and *grit* as the central goals and theme of this edition. As you may know, studies find that these two factors may be the most significant factors in determining career and academic success. In fact, some research suggests that they may be even more important than IQ (Datu et al., 2016; Dweck, 2007, 2012; Suzuk et al., 2015).

With this focus on a growth mindset and grit in mind, we start each chapter with a NEW *Psychology and a Classic* (or *Contemporary*) *Success* feature, which offers a brief description of a famous figure who exemplifies both qualities. (See the following example of J. K. Rowling.) The stories are then embedded throughout each chapter to illustrate core concepts. We believe offering these repeated success stories will reassure our readers that achievement is largely under their control,

Try This Yourself

Testing for Reflexes

If you have a newborn or young infant in your home, you can easily (and safely) test for these simple reflexes. (Most infant reflexes disappear within the first year of life. If they reappear in later life, it generally indicates damage to the central nervous system.)

Test Your Critical Thinking

1. What might happen if infants lacked these reflexes?
2. Can you explain why most infant reflexes disappear within the first year?


photos by Linnea Leaver Mavrides/Courtesy Catherine Sanderson

A Rooting reflex
Lightly stroke the cheek or side of the mouth, and watch how the infant automatically (reflexively) turns toward the stimulation and attempts to suck.


photos by Linnea Leaver Mavrides/Courtesy Catherine Sanderson

B Grasping reflex
Place your finger or an object in the infant's palm and note his or her automatic grasping reflex.


photos by Linnea Leaver Mavrides/Courtesy Catherine Sanderson

C Babinski reflex
Lightly stroke the sole of the infant's foot, and the big toe will move toward the top of the foot, while the other toes fan out.

Research Challenge

Why Do Men and Women Lie About Sex?

The *social desirability bias* is of particular concern when we study sexual behaviors. A fascinating example comes from a study that asked college students to complete a questionnaire regarding how often they engaged in 124 different gender-typical behaviors (Fisher, 2013). Some of these behaviors were considered more typical of men (such as wearing dirty clothes and telling obscene jokes), whereas other behaviors were more common among women (such as writing poetry and lying about their weight). Half of the participants completed these questionnaires while attached to what they were told was a polygraph machine (or lie detector), although in reality this machine was not working. The other half completed the questionnaires without being attached to such a machine.

Can you predict how students' answers differed as a function of their gender and whether they were (or were NOT) attached to the supposed lie detector? Among those who were attached to a supposed lie detector and who believed that it could reliably detect their lies, men were more likely to admit that they sometimes engaged in behaviors seen as more appropriate for women, such as writing poetry. In contrast, women were more likely to admit that they sometimes engaged in behaviors judged more appropriate for men, such as telling obscene jokes. Even more interesting, men reported having had more sexual partners when they weren't hooked up to the lie detector than when they were. The reverse was true for women! They reported fewer partners when they were not hooked up to the lie detector than when they were.

How does the *social desirability response* help explain these differences? We're all socialized from birth to conform to norms (unwritten rules) for our culturally approved male and female behaviors. Therefore, participants who were NOT attached to the supposed lie detector provided more "gender appropriate" responses. Men admitted telling obscene jokes and reported having more sexual partners, whereas women admitted lying about their weight and reported having fewer sexual partners.

These findings were virtually reversed when participants believed they were connected to a machine that could detect their lies. This fact provides a strong example of the dangers of the social desirability response. It also reminds us, as either researchers or consumers, to be very careful when interpreting findings regarding sexual attitudes and behaviors. Gender roles may lead to inaccurate reporting and exaggerated gender differences.


Intl St Clair/Getty Images

Test Yourself

1. Based on the information provided, did this study (Fisher, 2013) use descriptive, correlational, and/or experimental research?
2. If you chose:
   - *descriptive research*, is this a naturalistic 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 it as a *quasi-experimental design*.)
   - both *descriptive* and *correlational*, answer the corresponding questions for both.

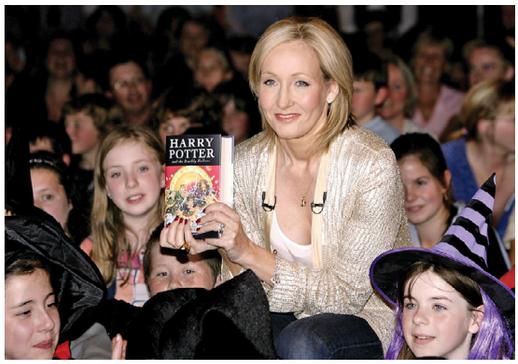
Check your answers by clicking on the answer button or by looking in Appendix B.

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 critical thinker and consumer of scientific research.

Study Tip

One way to differentiate the two subdivisions of the ANS is to imagine skydiving out of an airplane. When you initially jump, your sympathetic nervous system has "sympathy" for your stressful situation. It alerts and prepares you for immediate action. Once your "para" chute opens, your "para" sympathetic nervous system takes over, and you can relax as you float safely to earth.

❖ Psychology and a Contemporary Success | J. K. Rowling



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Joanne Rowling, best known as J. K. Rowling (1965–), is a British novelist, screenwriter, and film producer famous for her authorship of the *Harry Potter* series of fantasy novels (see photo). Rowling (pronounced *rolling*) was born in Yate, England, to parents who, as she says, "came from impoverished backgrounds and neither of whom had been to college." They did, however, love to read, and Rowling grew up surrounded by books to become the classic "bookworm." After graduating from Exeter University, Rowling moved to Portugal, where she met and married a Portuguese journalist. The marriage soon ended in divorce, and Rowling moved with her daughter to live near her sister in Edinburgh, Scotland. Struggling to support herself and her young daughter, she reluctantly signed up for welfare benefits, saying that she was "as poor as it is possible to be . . . without being homeless." Rowling sold her first novel in the Harry Potter series for only $4,000. Since then, though, this series of books has sold over 450 million copies (McClurg, 2017; Rowling, n.d.).

Despite her apparently wildly successful life, Rowling has endured numerous hardships. She reports that her teenage years were very unhappy due to her mother's protracted illness and a strained relationship with her father. The period after her divorce and her mother's painful death from multiple sclerosis was a particularly difficult time for Rowling. She saw herself as such a dismal failure that she even contemplated suicide. Fortunately, therapy helped her climb out of her diagnosed clinical depression, and she later reported that it was her experiences with such deep despair that led her to create the *Dementors*—the soul-sucking monsters found in the *Harry Potter* series (Bennett, 2012; Oppenheim, 2016; Rowling, n.d.).

and thereby inspire them to use grit and a growth mindset to achieve their own personal dreams and aspirations. As shown in **Table 1**, we also include two additional NEW features—*Psychology and Your Personal Success* and *Psychology and Your Professional Success*—to further demonstrate how the content of each chapter, along with a growth mindset and grit, can help them succeed in the real world.

Given that our gracious and loyal previous adopters may be interested in what changes we've made and/or the updating we've added in this 12th edition (i.e., to the basic content, key terms, and continued features), we've created a handy summary of these changes in **Table 2**. This table also summarizes the key assets for each chapter provided in WileyPLUS.

Additional Resources

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Given that students obviously don't all learn and achieve at the same rate, WileyPLUS with ORION provides adaptive practice in a digital tutorial, homework, and assessment platform that significantly improves individual student performance and success rates.

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Personal Acknowledgments from the Authors

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TABLE 1 New Special Features in *Psychology in Action*, 12e

Chapter Title	Psychology and a Classic/ Contemporary Success	Psychology and Your Professional Success	Psychology and Your Personal Success	WileyPLUS Assets : Animations(A), Mini Courses(MC), and Interactives(I)
1 **Introduction and Research Methods**	Michael Jordan	Would You Like a Career in Psychology?	Why Are a Growth Mindset and Grit Important?	• Correlation does not mean causation (A) • Components of an experiment (A) • Research methods (MC) • The scientific method (I)
2 **Neuroscience and Biological Foundations**	Adele Diamond		How to Train Your Brain	• Sympathetic and parasympathetic nervous systems (A) • Peripheral and central nervous systems (A) • Lateralization of the brain (A) • The human brain (MC) • Key parts of the neuron (I) • Communication between neurons (I)
3 **Stress and Health Psychology**	Marcus Luttrell	How Well Do You Cope with Job Stress?	Can Mindfulness Improve Your GPA?	• Three types of conflict (A) • The HPA axis and General Adaptation Syndrome (A) • Physical response to stress (MC)
4 **Sensation and Perception**	Helen Keller		Helen Keller's Inspiring Advice	• Sensation vs. perception (A) • The body senses (A) • Understanding perception: Selection and interpretation (A)
5 **States of Consciousness**	Albert Einstein	Potential Career Costs of Addiction	Can Maximizing Your Consciousness Save Lives?	• Inattentional blindness, selective attention, automatic vs. controlled processes (A) • Sleep deprivation (A) • Why we sleep: Four theories (A) • Agonist and antagonist drugs: How do they produce their effects? (I)
6 **Learning**	Cesar Millan	Why Can't We Get Anything Done Around Here?	Can Learning Principles Help You Succeed in College?	• Reinforcement vs. punishment (A) • Effective use of reinforcement and punishment (A) • Six principles of operant conditioning (A) • Schedules of reinforcement (A) • Classical conditioning (MC)
7 **Memory**	Elizabeth Loftus		Can Memory Improvement Increase Success?	• ESR memory model (A) • Factors in forgetting (A) • Memory distortions (A) • Memory tools for student success (A)
8 **Thinking, Language, and Intelligence**	Bill Gates	Is a High IQ Essential to High Achievement?	Strategies for Better Problem Solving	• Problem solving (A) • Barriers to problem solving (A) • Issues in measuring intelligence (A) • Language and the brain (I) • Language acquisition (I)

Chapter Title	Psychology and a Classic/ Contemporary Success	Psychology and Your Professional Success	Psychology and Your Personal Success	WileyPLUS Assets : Animations(A), Mini Courses(MC), and Interactives(I)
9 Life Span Development I	Oprah Winfrey	Does Ageism Matter?	The Power of Touch	• Research methods in development: Cross-sectional vs. longitudinal design (I) • Cognitive development (A) • Styles of attachment (A) • Parenting styles (I)
10 Life Span Development II	Nelson Mandela		What Are the Secrets to Enduring Love?	• Moral development (A) • Erikson's psychosocial theory (MC)
11 Gender and Human Sexuality	Ellen DeGeneres		Are Your Conflicts Constructive or Destructive?	• Cognitive factors influencing arousal (A)
12 Motivation and Emotion	Malala Yousafzai	What Are the Best Ways to Increase Motivation?	Are There Research-Based Secrets for Happiness?	• Environmental factors in eating and obesity (A) • Persistence and grit (A) • Theories of motivation (MC) • Symptoms of anorexia and bulimia (I)
13 Personality	Abraham Lincoln	Should You Match Your Personality With Your Career?	Can (and Should) We Improve Our Personalities? Could You Pass the Marshmallow Test?	• Trait theories (A) • Unconditional love (A) • Reciprocal determinism (A) • Freud's personality structure (I)
14 Psychological Disorders	Jennifer Lawrence		Can Resilience Promote Mental Health in Children and Adults?	• How phobias are created (A) • Learned helplessness (A) • Gender differences in managing depression (A) • Biopsychosocial model of schizophrenia (MC) • Anxiety disorders (I)
15 Therapy	J. K. Rowling		What Are the Keys to Good Mental Health?	• Systematic desensitization (A) • Operant conditioning (A) • Group therapy (A) • Cognitive behavioral therapy (MC) • Three major approaches to therapy (I) • Five common goals of therapy (I)
16 Social Psychology	Sonia Sotomayor	How Can We Reduce Attributional Biases? Can Prejudice Affect Your Career Success?	Using Psychology to Increase Your Dating Appeal	• Attribution (A) • Groupthink (A) • Altruism: Why do we help? (A) • Cognitive dissonance (MC) • Prejudice and discrimination (I)

TABLE 2 Continuing Special Features in *Psychology in Action*, 12e

Chapter Title	Research Challenges (RC)/ Gender and Cultural (G&C) Diversity	Significantly Revised Topics (RT)/Added New Topics (ANT)	Deleted Key Terms (DKT)/ New Key Terms (NKT)	NOW in WileyPlus Critical Thinking Exercises (CT)/ Media Challenges (MC)	*Sample* WileyPlus Assets: Videos (V), Animations (A), Virtual Field Trips (VFT)
1 Introduction and Research Methods	(RC) Why Do Men and Women Lie About Sex? (G&C) Psychology's History of Diversity	(RT) Moved research ethics to the Science of Psychology section, updated and revised correlational research (ANT) New connections of famous figure (Michael Jordan) with key chapter topics. Added discussion of quasi-experimental designs, growth mindset, and grit	(DKT) The term "survey" replaced with survey/interview (NKT) Functionalism, grit, growth mindset, natural selection, representative sample, structuralism	(CT) How to Think Critically About Psychological Science (MC) Is College Worth It?	Applying Research Methods (V) The Experiment (V) The Art of Prediction (A) Yerkes Primate Center (VFT)
2 Neuroscience and Biological Foundations	(RC) Does Lying Lead to More Lies? (RC) Phineas Gage—Myths versus Facts (G&C) Are Male and Female Brains Different? (G&C) Culture and Job Stress	(RT) Moved Genetic Inheritance to Ch. 9, expanded discussion of frontal lobes (ANT) New connections of famous figure (Adele Diamond) with key chapter topics. Added discussion of executive functions and positive effects of simple mental skills training and physical exercise on brain functioning	(DKT) Moved key terms related to genetics to Chapter 9 (NKT) All-or-nothing principle, executive functions, fight-flight-freeze response, motor cortex, nervous system, somatosensory cortex	(CT) DNA Testing: Changing Lives, Saving Lives (MC) The (Invisible) Plague of Concussion	Dissecting the Brain (V) Interaction of Genes and Environment (V) Drawing and Building A Brain (V) The Brain (A) Alcohol, Neurotransmitters and Your Brain (A) Neuroimaging (VFT) Reading Your DNA (VFT)
3 Stress and Health Psychology	(RC) What are the Hidden Benefits of Practice Testing? (RC) When Do Losers Actually Win? (G&C) What are the Problems with Acculturative Stress?	(RT) Updated and revised the benefits of stress, social media's negative effects, and PTSD with a focus on veterans (ANT) New connections of famous figure (Marcus Luttrell) with key chapter topics. Added discussion of acculturative stress, chronic pain, and cognitive appraisal. Moved table and major discussion of defense mechanisms from Chapter 13 to this chapter	(DKT) Type A and Type B (NKT) Acculturative stress, chronic pain, fight-flight-freeze response (versus fight or flight)	(CT) Perils of Procrastination (MC) Are We Denying the Dangers of Stress?	Sources of Stress (V) Coping with Stress (V) Positive Psychology (V) Biofeedback (VFT) Managing Stress Improves Health (A)

Chapter Title	Research Challenges (RC)/ Gender and Cultural (G&C) Diversity	Significantly Revised Topics (RT)/Added New Topics (ANT)	Deleted Key Terms (DKT)/ New Key Terms (NKT)	NOW in Wiley-Plus Critical Thinking Exercises (CT)/ Media Challenges (MC)	*Sample* WileyPlus Assets: Videos (V), Animations (A), Virtual Field Trips (VFT)
4 Sensation and Perception	(RC) Can Music Improve the Taste of Beer? (RC) Does Wearing Red Increase Your Sex Appeal? (G&C) Are the Gestalt Laws Universally True?	(ANT) New connections of famous figure (Helen Keller) with key chapter topics. Added discussion and new figure on feature detectors in the brain, new figure and research on depth perception	(NKT) Gestalt psychology, parapsychology, priming, volley principle for hearing	(CT) Why Do So Many People Believe in ESP? (MC) Astrology and Crime	Seeing and Hearing (V) A World Turned Upside Down: Visual Processing (V) Perception (A) How We See and Hear (A) 3-D Media (VFT)
5 States of Consciousness	(RC) What's Wrong with Distracted Driving? (G&C) Are There Differences in Dreams?	(RT) Significantly updated and revised text on sleep deprivation, opioids, LSD, Ketamine, and marijuana (ANT) New connections of famous figure (Albert Einstein) with key chapter topics. Added discussion of effects of multitasking on learning, new figure on sleep deprivation, emotionality and impulse control	(NKT) Inattentional blindness, suprachiasmatic nucleus	(CT) The Spectacular Now (MC) Teen Night Owls	Automatic Processing and Multitasking (V) Myths about Sleep, Dreaming and Drugs (V) Diagnosing Sleep Disorders (VFT)
6 Learning	(RC) Do Dogs Prefer Food or Praise? (RC) Does the Media Impact Our Body Size Preferences?	(RT) Expanded discussion of Skinner's response to Thorndike and his definition of reinforcement and punishment (ANT) New connections of famous figure (Cesar Millan) with key chapter topics, added discussion of classical conditioning and emotional eating	(DKT) Removed conditioning as a key term, and the word "stimulus" from key terms of generalization and discrimination	(CT) What Kind of Name Is Ryan For a Girl? (MC) The Return of the Working Class Hero	Classical and Operant Conditioning in Action (V) Understanding Reinforcement and Punishment (V) Classical Conditioning (A) The Search Dog Foundation (VFT)
7 Memory	(RC) Can Taking Photos Impair Our Memories? (G&C) Does Culture Affect Memory?	(RT) Updated and expanded discussion of infant memories, working memory with new figure, traumatic brain injury, eyewitness testimony, and repressed memories (ANT) New connections of famous figure (Elizabeth Loftus) with key chapter topics. Added discussion and new figure of the four major models of memory	(DKT) Sleeper effect (NKT) Parallel distributed processing, repression	(CT) Critical Thinking Is No Laughing Matter . . . Or Is It? (MC) How Memoirists Mold the Truth	Constructing Memory (V) Organizing Long-Term Memories (V) How Could I Forget That? (V) Eyewitness Memory (V) Enhancing Your Memory (A) USA Memory Championships (VFT) Alzheimer's Treatment Center (VFT)

TABLE 2 Continuing Special Features in *Psychology in Action*, 12e *(continued)*

Chapter Title	Research Challenges (RC)/ Gender and Cultural (G&C) Diversity	Significantly Revised Topics (RT)/Added New Topics (ANT)	Deleted Key Terms (DKT)/ New Key Terms (NKT)	NOW in WileyPlus Critical Thinking Exercises (CT)/ Media Challenges (MC)	*Sample* WileyPlus Assets: Videos (V), Animations (A), Virtual Field Trips (VFT)
8 Thinking, Language, and Intelligence	(RC) Is creativity Linked with Psychological Disorders? (G&C) Can Your Nonverbal Language Reveal Your Roots?	(RT) Updated discussion on the value of play and creativity, expanded and updated research on controversies surrounding racial/ethnic differences (ANT) New connections of famous figure (Bill Gates) with key chapter topics and added new discussion of artificial intelligence	(DKT) Babbling, cooing, overextension, overgeneralization, savant syndrome, telegraphic speech (NKT) Artificial intelligence, cognitive offloading, convergent thinking, embodied cognition, mental age, triarchic theory of intelligence	(CT) 12 Years A Slave (MC) How Social Media Is Ruining Our Minds	Barriers to Problem Solving (V) Understanding IQ (V) Standards for Psychological Tests (V) Problem Solving (A) Baby Sign Language (VFT) High IQ Society (VFT) Down Syndrome Connection (VFT)
9 Life Span Development I	(RC) Deprivation and Development (G&C) Should Diversity Affect Research?	(RT) Expanded discussion of cultural effects on developmental research. Added new research on prenatal exposure to smoke and later obesity and how taking "selfies" relates to narcissism (ANT) New connections of famous figure (Oprah Winfrey) with key chapter topics. Added discussion of imprinting, along with new figure and section on genetics and theory of mind	(DKT) Moved age-related positivity effect to Chapter 10 (NKT) Behavioral genetics, chromosomes, DNA, epigenetics, gene, temperament, theory of mind	(CT) Overcoming Egocentric Thinking (MC) Older and Slower?	Understanding Development in Context (V) The Strange Situation (V) Attachment Through the Lifespan (V) A Guide to Parenting (VFT) Piaget and Cognitive Development (A)
10 Life Span Development II	(RC) Are Brain Differences Associated with Age-Related Happiness? (G&C) Effects on Moral Development	(RT) New section on how to increase your positivity and how traveling may increase immoral behavior (ANT) New connections of famous figure (Nelson Mandela) with key chapter topics. Added discussion of connection of theory of mind with autism, along with the age-related positivity effect	(DKT) Moved resiliency to Chapter 14 (NKT) Age-related positivity effect	(CT) Morality and Academic Cheating (MC) Millennials: Not the Marrying Kind	Kohlberg's Stages of Moral Reasoning (A) Erikson's Psychosocial Theory (V) Factors in Marital Satisfaction (V) Attitudes Toward Aging (V) Dying with Dignity: Hospice (VFT)

Chapter Title	Research Challenges (RC)/ Gender and Cultural (G&C) Diversity	Significantly Revised Topics (RT)/Added New Topics (ANT)	Deleted Key Terms (DKT)/ New Key Terms (NKT)	NOW in WileyPlus Critical Thinking Exercises (CT)/ Media Challenges (MC)	*Sample* WileyPlus Assets: Videos (V), Animations (A), Virtual Field Trips (VFT)
11 Gender and Human Sexuality	(RC) Is Gender Income Inequality Real? (RC) Does Political Affiliation Reflect Sexual Behavior? (G&C) Sexuality Across Cultures	(RT) Expanded discussion of sexual prejudice and sexual orientation, including LGBTQ (ANT) New connections of famous figure (Ellen DeGeneres) with key chapter topics. Added new discussion on gender and income inequality, the double standard, pair bonding, the fallacy of "stranger danger," and child sexual abuse	(NKT) Double standard, gender stereotypes, pair bonding, sexuality, sexually transmitted infection	(CT) The Scarlet Letter (MC) Scarcity of Women in Science?	Clearing Up the Confusion: Gender Roles, Gender Identity and Sexual Orientation (V) Gender (A) The Sexual Response Cycle (V) Healthy Sexuality (V) Sexual Communication (V) Planned Parenthood (VFT)
12 Motivation and Emotion	(RC) Does Wearing "Sexy" Clothing Signal Sexual Interest? (G&C) Are Emotions Affected by Culture and Evolution?	(RT) Revised discussion and figure on intrinsic vs. extrinsic motivation, and updated and expanded theories on basic emotions (ANT) New connections of famous figure (Malala Yousafzai) with key chapter topics. Added new table and research: • Emotions • Psychology of happiness • Botox injections and the link to decreased empathy • How expectancies increase alcohol consumption • How sleep deprivation, photos of food, and processed foods increase eating	(NKT) Adaptation-level phenomenon, display rules	(CT) The New Psychology of Success (MC) Mirror, Mirror on The Wall?	Get Motivated (V) Hormones and Hunger (V) Emotional Intelligence (V) The Polygraph (A) Surgical Weight Loss Center (VFT)
13 Personality	(RC) Do Nonhuman Animals Have Unique Personalities?	(RT) Revised levels of consciousness figure, updated step-by-step diagram on psychosexual stages, moved defense mechanisms table to Ch. 3, revised five-factor model and self-concept figures	(DKT) Morality principle, pleasure principle, reality principle (NKT) Behavioral genetics, character, temperament	(CT) Maslow Revisited (MC) Can Personality Predict Health?	Applying Rogerian Techniques (V) Exploring Your Personality (V) Measuring Personality (V) Freud's Defense Mechanisms (A) Personality Research (VFT)

TABLE 2 Continuing Special Features in *Psychology in Action*, 12e *(continued)*

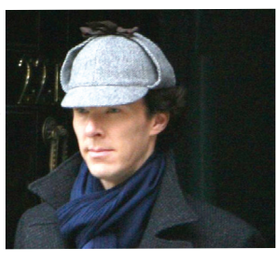
Chapter Title	Research Challenges (RC)/ Gender and Cultural (G&C) Diversity	Significantly Revised Topics (RT)/Added New Topics (ANT)	Deleted Key Terms (DKT)/ New Key Terms (NKT)	NOW in WileyPlus Critical Thinking Exercises (CT)/ Media Challenges (MC)	*Sample* WileyPlus Assets: Videos (V), Animations (A), Virtual Field Trips (VFT)
		(ANT) New connections of famous figure (Abraham Lincoln) with key chapter topics. Added discussion and figures: • Freud and modern western culture • Mischel's marshmallow test • Personality and behavioral genetics • Identical vs. fraternal twins and adoption studies • Introversion and extraversion misconceptions			
14 Psychological Disorders	(RC) Are Head Injuries Related to Depressive and Other Psychological Disorders? (RC) Does Unequal Pay for Equal Work Increase Female Anxiety and Depression?	(RT) Moved and expanded discussion of the stigma of mental illness, suicide and other general terms to front of chapter to better apply to all disorders, expanded discussion of gender strategies for managing depression (ANT) New connections of famous figure (Jennifer Lawrence) with key chapter topics. Added discussion and new figures: • OCD • Antisocial and borderline personality disorders • Nonsuicidal self-injury • Psychology student syndrome • Resilience	(NKT) Mania, major depressive disorder, nonsuicidal self-injury, psychological disorder, psychology student syndrome, resilience	(CT) How Your Thoughts Can Make You Depressed (MC) Lefties and Psychotic Disorders	Myths About Mental Illness (V) Signs of Suicide (V) OCD (VFT) Bipolar Disorder (VFT) Schizophrenia (A)
15 Therapy	(RC) Can Watching Movies Prevent Divorce? (G&C) Therapy in Action	(RT) Moved evaluation of psychoanalysis to include psychoanalytic therapies, significantly revised figures for systematic desensitization and aversion therapy	(DKT) Antianxiety drugs, antidepressant drugs, mood-stabilizer drugs	CT) Cinema Therapy (MC) Finding Treatment Grows Harder	A Guide to Psychotherapy (V) Myths About Therapy (V) CBT (A) ECT Treatment Center (VFT) Kicking the Habit: Drug Treatment (VFT)

Chapter Title	Research Challenges (RC)/ Gender and Cultural (G&C) Diversity	Significantly Revised Topics (RT)/Added New Topics (ANT)	Deleted Key Terms (DKT)/ New Key Terms (NKT)	NOW in Wiley-Plus Critical Thinking Exercises (CT)/ Media Challenges (MC)	*Sample* WileyPlus Assets: Videos (V), Animations (A), Virtual Field Trips (VFT)
		(ANT) New connections of famous figure (J. K. Rowling) with key chapter topics. Added new discussion, figures and/or tables: • Cognitive triad and depression • Token economy • Evidence-based practice in psychology (EBPP) • Side-by-side comparison of treatments for psychological disorders • Psychedelic drugs and psychosis • Evidence-based practice in psychology (EBPP) • Metacognitive therapy • Mindfulness-based cognitive therapy (MBCT) Therapeutic alliance • Well-being therapy (WBT)	(NKT) Evidence-based practice in psychology (EBPP), metacognitive therapy, mindfulness-based cognitive therapy (MBCT), therapeutic alliance, well-being therapy (WBT)		
16 Social Psychology	(RC) Can a 10-Minute Conversation Reduce Prejudice? (G&C) How Does Culture Affect Personal Space? (RC) Can Long-Distance Relationships Survive?	(RT) Moved prejudice to social cognition section, expanded discussion on flirting, deleted female named hurricanes (ANT) New connections of famous figure (Sonia Sotomayor) with key chapter topics. Added new discussions and/or new figures: • Prefrontal cortex and relation to social behavior • How taking pain pills can change attitudes • Implicit biases • Saving your own life • Social facilitation • Social loafing	(DKT) Frustration-aggression hypothesis, mere-exposure effect (NKT) social facilitation, social loafing, changed triarchic theory of love to triangular theory of love	(CT) To Kill A Mockingbird (MC) When Science Becomes News	Implicit Attitudes (V) Bystander Effect (V) Attitudes and Cognitive Dissonance (A) Internet Dating (VFT)

Prologue

Successful Living Through Critical Thinking

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



Benedict Cumberbatch as Sherlock

courtesy The Gottman Institute

John Gottman as John Gottman

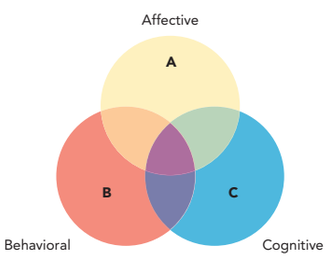


FIGURE 1 ABCs of Critical Thinking

> *"Sherlock Holmes is not a cold, calculating, self-gratifying machine. He cares for Watson. . . and for Mrs. Hudson. He has a conscience . . . In other words, Holmes has emotions—and attachments—like the rest of us. What he's better at is controlling them and only letting them show under very specific circumstances."*
>
> Maria Konnikova (2012), "Stop Calling Sherlock Holmes A Sociopath!"

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

Why are we opening this Prologue on Critical Thinking with a discussion of emotions? We believe, as Sherlock Holmes did, that our capacity for objective reason is compromised when we are highly emotional (Halpern, 2014; Paul & Elder, 2002). What about Sherlock Holmes' love life? Although he "cared deeply" about special people in his life, he apparently never experienced *romantic love*. Had Holmes been a real person working with Dr. John Gottman (a preeminent authority on romantic relationships—see Chapter 10), and had he applied his critical thinking skills to his love life, he may have been more successful. Effective critical thinking is the best route to finding lasting love, as well as the best antidote to self-defeating, repetitive thoughts, feelings and actions. Unlike the common use of "critical" as a negative type of criticism and fault finding, critical thinking is a positive, life-enhancing process and key to success in all parts of our lives.

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

Critical Thinking Components (CTCs)

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

Affective Components (Emotional foundation for critical thinking)

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

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

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

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

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

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

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

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

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

Behavioral Components (Actions necessary for critical thinking)

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

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

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

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

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

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

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

Cognitive Components (Thought processes required for critical thinking)

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

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

members that were homeless, indulging in illegal drugs, were the truth for me. I valued my life more than I wanted to fit in. Nicole Bouvet

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

    Overgeneralization is applying an experience to other situations that are only superficially similar. It's also a form of "tunnel vision"—failing to see the bigger picture because you see just a small sample of the whole. *While watching a rerun of "Jersey Shore," I made an over-generalization about "Jersey guys"! The show convinced me that every Jersey boy in his twenties was a meathead without moral values and who only cared about his looks. I met a Jersey boy and automatically thought he was like one of the guys from the show. Turns out he was an educated man who happened to come from New Jersey.* Caitie Stoneback

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

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

    Nivedita "Minu" Mahato

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

    Courtney Fisher

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

    Laura Markley

CHAPTER 1

Introduction and Research Methods

CHAPTER OUTLINE	LEARNING OBJECTIVES
❖ Psychology and a Contemporary Success Michael Jordan	
1.1 Introducing Psychology • Psychology's Past • Modern Psychology GCD **Gender and Cultural Diversity** **Psychology's History of Diversity** ❖ Psychology and Your Professional Success Would You Like a Career in Psychology?	**Summarize psychology's past, modern perspectives, and what psychologists do.** • **Define** psychology, critical thinking, and pseudopsychologies. • **Review** structuralism, functionalism, and the psychoanalytic perspectives. • **Discuss** modern psychology's seven major perspectives and the contributions of women and people of color. • **Describe** the biopsychosocial model, along with individualistic and collectivistic cultures. • **Summarize** psychology's major career options and specialties.
1.2 The Science of Psychology • Basic and Applied Research • The Scientific Method • Psychology's Four Main Goals • Psychology's Research Ethics	**Discuss the key principles underlying the science of psychology.** • **Compare and contrast** the fundamental goals of basic and applied research. • **Describe** the scientific method, its key terms, and its six steps. • **Review** psychology's four main goals. • **Discuss** the ethical concerns and guidelines for psychological research.
1.3 Research Methods • Descriptive Research • Correlational Research • Experimental Research • Research Problems and Safeguards RC **Research Challenge** **Why Do Men and Women Lie About Sex?**	**Summarize psychology's three major research methods.** • **Review** descriptive research and its four key methods. • **Discuss** correlational research and its limits and value. • **Identify** the key terms and components of experimental research.
1.4 Tools for Student Success • Study Habits • Time Management • Grade Improvement • Attitude Adjustment ❖ Psychology and Your Personal Success Why Are a Growth Mindset and Grit Important?	**Review the key strategies for student success.** • **Describe** the four steps important to improving your study habits. • **Discuss** ways to improve your time management. • **Identify** the key factors in grade improvement. • **Summarize** why attitude adjustment is key to student success.

Leigh Vogel/Contributor/Getty Images

❖ Psychology and a Contemporary Success | Michael Jordan

Who comes to your mind when someone mentions the best ever basketball player? For most of us, and even according to the official NBA website, Michael Jordan (1963–) is judged to be "the greatest basketball player of all time." Born into a family of five children, Jordan always loved sports and played with an unusual passion, yet he failed to make his high school basketball team in his sophomore year. He overcame this early setback and made the team the following year, later earning a scholarship to play for the University of North Carolina—thanks to his perseverance and intensive practice. Even more impressive, Jordan went on to play professionally for the Chicago Bulls, where he led the team to six NBA championships and won the Most Valuable Player Award five times. In 2016, Barack Obama presented Jordan with one of the nation's highest honors—the Presidential Medal of Freedom. (See the photo.)

How do psychologists explain this incredible level of achievement? Researcher Carol Dweck believes Jordan reflects a **growth mindset**, the self-perception that one's abilities can change and improve with effort (Dweck, 2007, 2012). Other psychologists have emphasized his **grit**, which includes perseverance and passion in the pursuit of long-term goals (Datu et al., 2016; Yeager et al., 2016). We'll discuss these very important traits in more detail at the end of this chapter and throughout this text.

Growth mindset A psychological term referring to a self-perception or a set of beliefs about one's personal abilities and the potential for change and improvement with effort.

Grit A psychological term referring to perseverance and passion in the pursuit of long-term goals.

Chapter Overview

Welcome to the exciting world of **Psychology in Action**. As the story of Michael Jordan and the name of this text imply, psychology is an *active*, dynamic field that affects every part of our lives—our relationships at home, college, and work, as well as in sports, politics, television, movies, newspapers, and the Internet. And psychology encompasses not only humankind but our nonhuman compatriots as well—from rats and pigeons to cats and chimps.

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. Next, we discuss the seven major perspectives of modern psychology, as well as its many different specialties and career options. Then, we explore the science of psychology, including basic and applied research, the scientific method, the four major goals of psychology, and its research ethics. Next, we discuss the three major research methods. We close with a section, called *Tools for Student Success*, that provides proven, research-based techniques for improving your study habits, time management, and grades, as well as showing you how psychology can contribute to your attitude adjustment and personal success. This section will help you enjoy and master the material in this and all your other college textbooks and courses. Be sure to study it carefully. We care about you and want you to succeed!

As further evidence of our commitment to your achievement, we've included numerous study tips throughout each chapter, along with a special feature (called *Psychology and a Contemporary Success*, shown above). These stories of real-life classic and contemporary figures who have prospered despite incredible obstacles have been shown to increase overall motivation and achievement. We also provide two additional sections—*Psychology and Your Professional Success* and *Psychology and Your Personal Success*, which highlight how psychology applies to your career and personal life. We believe this focus on success will not only help you master the content of the course, but will also inspire your own personal efforts and ultimate life success.

Finally, we invite you to let us know how your study of psychology (and this text) affects you and your life. You can reach us at khuffman@palomar.edu, kdowdell@dmacc.edu, and casanderson@amherst.edu. We look forward to hearing from you.

Warmest regards,

Courtesy of Karen Huffman

Courtesy of Katherine Dowdell

courtesy of Catherine Sanderson

Why Study Psychology?

Did you know that the study of psychology

- . . . will increase your chances for personal, academic, and professional success? Our major goal for this edition of *Psychology in Action* is to help maximize your overall success and ability to persist during difficult and challenging times through a repeated focus on a *growth mindset* and on *grit*, which includes both passion and perseverance in the pursuit of long-term goals.
- . . . will deepen your understanding of yourself and others? The Greek philosopher Socrates admonished us long ago to, "Know thyself." Studying psychology will greatly contribute to your understanding (and appreciation) of yourself and others. Knowing thyself and others, along with psychology's scientifically based guidelines and techniques, will also improve your relationships with friends, family, and coworkers.
- . . . will broaden your general education and success as a global citizen? Psychology is an integral part of today's political, social, and economic world. Understanding its principles and concepts is essential to becoming an educated, well-informed person who can contribute to society and succeed in our global economy.

Paul Bradbury/ OJO Images/ Getty Images

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

1.1 Introducing Psychology

LEARNING OBJECTIVES

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

Summarize psychology's past, modern perspectives, and what psychologists do.

- **Define** psychology, critical thinking, and pseudopsychologies.
- **Review** structuralism, functionalism, and the psychoanalytic perspectives.
- **Discuss** modern psychology's seven major perspectives and the contributions of women and people of color.
- **Describe** the biopsychosocial model, along with individualistic and collectivistic cultures.
- **Summarize** psychology's major career options and specialties.

Study Tip

Learning Objectives

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

Psychology The scientific study of behavior and mental processes.

The term **psychology** derives from the roots *psyche*, meaning "mind," and *logos*, meaning "word." Modern psychology is most commonly defined as the *scientific study of behavior and mental processes. Scientific* is a key feature of the definition because psychologists follow strict scientific procedures to collect and analyze their data. *Behavior* (such as crying, hitting, and sleeping) can be directly observed. *Mental processes* are private, internal experiences that cannot be directly observed (like feelings, thoughts, and memories). As you can see in the photo, psychologists study not only behavior and mental processes, but also the application of that knowledge to marketing, health management, and many other aspects of our everyday life.

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

Psychology also places high value on *empirical evidence* that can be objectively tested and evaluated. In addition, psychologists emphasize **critical thinking**, *the process of objectively evaluating, comparing, analyzing, and synthesizing information* (Caine et al., 2016; Halpern, 2014). Unfortunately, a recent study revealed that high school and college students can't tell the difference between factual information presented by a reputable newspaper and that presented online by fringe activist groups (Wineberg & McGrew, 2016). In this study, college students were given 10 minutes to review two different websites: one belonged to the American Academy of Pediatrics (a reputable organization nearly 100 years in existence and with over 65,000 members) and the other belonged to the American College of Pediatricians (a group that has only about 200 members and has been classified as a hate group for claiming homosexuality is linked with pedophilia). Yet college students generally saw information presented by both groups as reliable. Does this help explain why the need to critically evaluate the information we receive, and its source, is particularly important during these times of heated political debates and growing reliance on social media outlets for news?

Jeff Morgan 01/Alamy Stock Photo

Psychology in action! One of the many benefits you'll receive from studying psychology is that you'll soon be able to easily recognize the psychological principles used in this ad that have been carefully designed to influence you as a prospective customer.

As part of your critical thinking, be careful not to confuse psychology, which is founded on the scientific method, with *pseudopsychologies*, which are based on false or unfounded common beliefs, folk wisdom, or superstitions. (*Pseudo* means "false.") These sometimes give the appearance of science, but they do not follow the basics of the scientific method. Examples include purported psychic powers, horoscopes, mediums, and self-help and "pop psych" statements such as "I'm mostly right brained" or "We use only 10% of our brains." For some, horoscopes or palmists are simple entertainment. Unfortunately, some true believers seek guidance and waste large sums of money on charlatans purporting to know the future or to speak with the deceased (e.g., Wilson, 2015b). Broken-hearted families also have lost valuable time and emotional energy on psychics claiming they could locate their missing children. As you can see, distinguishing scientific psychology from pseudopsychology is vitally important (Lilienfeld et al., 2010, 2015; Loftus, 2010). Given the popularity of these misleading beliefs, be sure to test your own possible myths in the following **Myth Busters** section.

Myth Busters

True or False?

____1. The best way to learn and remember information is to "cram," or study it intensively during one concentrated period.

____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. Eyewitness testimony is often unreliable.

____6. Polygraph ("lie detector") tests can accurately and reliably reveal whether a person is lying.

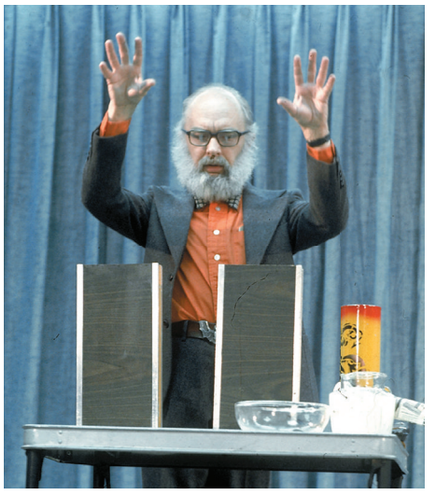
____7. Behaviors that are unusual or violate social norms may indicate a psychological disorder.

____8. People with schizophrenia have multiple personalities.

____9. Similarity is one of the best predictors of satisfaction in long-term relationships.

___10. In an emergency, as the number of bystanders increases, your chance of getting help decreases.

The magician James Randi has dedicated his life to educating the public about fraudulent pseudopsychologists. Along with the prestigious MacArthur Foundation, Randi has offered $1 million to "anyone who proves a genuine psychic power under proper observing conditions" (Randi, 2014; The Amazing Meeting, 2011). Even after many years, the money has never been collected, and the challenge has been terminated. For details, please see http://web.randi.org/home/jref-status



Henry Groskinsky/Time Life Pictures/Getty Images

Answers: 1. False (Chapter 1), 2. False (Chapter 4), 3. False (Chapter 5), 4. False (Chapter 6), 5. True (Chapter 7), 6. False (Chapter 12), 7. True (Chapter 14), 8. False (Chapter 14), 9. True (Chapter 16), 10. True (Chapter 16)

Psychology's Past

Although people have long been interested in human nature, it was not until the first psychological laboratory was founded in 1879 that psychology as a science officially began. 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.

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 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; Goodwin, 2012).

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 elements, or "structures," of mental life through introspection and then to determine how these elements combine to form the whole of experience. Because introspection could not be used to study animals, children, or more complex mental disorders, however, structuralism failed as a working psychological approach. Although short-lived, it did establish a model for studying mental processes scientifically.

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

Structuralism Early psychological approach promoted by Wundt and Titchener that used introspection to study the basic elements (or structures) of the mind.

Functionalism Early psychological approach associated with William James that explored how the mind functions to enable organisms to adapt to their environment.

Bettmann/Getty Images

FIGURE 1.1 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.

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

Psychodynamic perspective A modern approach to psychology that emphasizes unconscious dynamics, motives, conflicts, and past experiences; based on the psychoanalytic approach, but focuses more on social and cultural factors, and less on sexual drives.

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.

Study Tip

Key Terms and Running Glossary

Pay close attention to all key terms and concepts, which are boldfaced in the text and then defined in the running glossary located in the margin. Key terms from all chapters also appear in a cumulative glossary provided with this text.

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

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

Freud: If it's not one thing, it's your mother. —Robin Williams (Comedian, Actor)

Modern Psychology

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

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

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

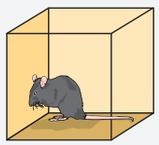
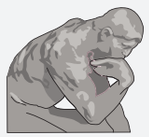
Most early behaviorist research was focused on learning; nonhuman animals were ideal participants for this research. One of the best-known behaviorists, B. F. Skinner, was convinced that behaviorist approaches could be used to "shape" human behavior (**Figure 1.2**). As you'll discover in Chapters 6 and 15, therapeutic techniques rooted in the behavioristic perspective have been most successful in treating observable behavioral problems, such as those related to phobias and alcoholism (Cheng et al., 2017; El-Bar et al., 2017; Tyner et al., 2016).

Nina Leen/Time & Life Pictures/Getty Images

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

Although the psychoanalytic and behavioral perspectives dominated psychology for some time, in the 1950s a new approach emerged—the **humanistic perspective**, which stresses *free will* (voluntarily chosen behavior) and *self-actualization* (an inborn drive to develop all one's talents and capabilities). According to Carl Rogers and Abraham Maslow, two central figures with this perspective, all individuals

TABLE 1.1 Modern Psychology's Seven Major Perspectives

Perspectives	Major Emphases	Sample Research Questions	
Psychodynamic	Unconscious dynamics, motives, conflicts, and past experiences	How do adult personality traits or psychological problems reflect unconscious processes and early childhood experiences?	
Behavioral	Objective, observable, environmental influences on overt behavior; stimulus–response (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?	
Study Tip **Illustrations** *Do not skip over photos, figures, and tables. They visually reinforce important concepts and often contain material that may appear on exams.*		**Why do we need seven 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.	 Makc/Shutterstock

naturally strive to develop and move toward self-actualization. Like psychoanalysis, humanistic psychology developed an influential theory of personality and its own form of psychotherapy (Chapters 12 and 15).

The humanistic approach also led the way to a contemporary research specialty known as **positive psychology**—the study of optimal human functioning (Diener, 2016; Diener & Tay, 2015; Seligman, 2003, 2015). For many years, psychology understandably focused on negative states, such as aggression, depression, and prejudice. In recent years, leaders in the

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

positive psychology movement, such as Ed Diener, Martin Seligman, and Shelly Taylor, have pushed for a broader study of human experiences, with an emphasis on: (1) *positive emotions* (like hope, love, and happiness), (2) *positive traits* (such as altruism, courage, and compassion), and (3) *positive institutions* that help promote better lives (such as improved schools and healthier families) (Seligman, 2003). Thanks to its scientific methodology and broader focus on optimal functioning, *positive psychology* has provided a wealth of new research found throughout this text.

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

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

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.

One of the most influential modern approaches, the **cognitive perspective**, emphasizes the mental processes we use in thinking, knowing, remembering, and communicating (Goldstein, 2015; Greene, 2016). These mental processes include perception, 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.

During the past few decades, scientists have explored the role of biological factors in almost every area of psychology. Using sophisticated tools and technologies, scientists who adopt this **biological perspective** examine behavior through the lens of genetics and biological processes in the brain and other parts of the nervous system. For example, 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; Wilson, 2015a).

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 most likely to live long enough to reproduce and thereby pass on their genes to the next generation. According to the evolutionary perspective, there's even an evolutionary explanation for the longevity of humans over other primates–it's grandmothers! Without them, a mother who has a two-year-old and then gives birth would have to devote her time and resources to the newborn at the expense of the older child. Grandmothers act as supplemental caregivers.

Finally, the **sociocultural perspective** emphasizes social interactions and cultural determinants of behavior and mental processes (**Figure 1.3**). Although we are often unaware of their influence, factors such as ethnicity, religion, occupation, and socioeconomic class have an enormous psychological impact on our mental processes and behavior.

For instance, researchers recently found that a 10-minute conversation with a random stranger led to significant decreases in *transphobia* (an irrational fear of transgender people) and that these effects lasted at least three months (Broockman & Kalla, 2016). What caused such a dramatic change? Rather than just presenting facts and talking "to" participants, the researchers asked them to recall and discuss their own personal experiences with judgment or prejudice. Afterward, they were encouraged to think about how their story related to the experiences of transgender people. Do you see how this type of *empathy induction*—encouraging someone to actively take the perspective of another—would lead to reduced prejudice? Or why this research was so widely cited in scientific journals and the mass media (Bohannon, 2016; Resnick, 2016)? It's due in part to the fact that deeply held attitudes, like prejudice, are so notoriously difficult to change. For more information on this study, see Chapter 16.

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FIGURE 1.3 Psychology in a global economy
Technological advances allow instant communication for people who not long ago were isolated from events in the rest of the world. How do you think these changes affect these men from Enaotai Island in West Papua, New Guinea?

Gender and Cultural Diversity

Psychology's History of Diversity

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' 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 from Cornell University in 1894. She also wrote several influential books and served as the second female president of the APA.

Francis Cecil Sumner became the first Black person to earn a Ph.D. in psychology (Clark University, 1920). Dr. Sumner later chaired one of the country's leading psychology departments, at Howard University. In 1971, one of Sumner's students, Kenneth B. Clark, became the first 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 advanced degrees in psychology greatly outnumber men, but, unfortunately, people of color are still underrepresented (Graduate Study in Psychology, 2017; Willyard, 2011).

Library of Congress Prints and Photographs Division

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.

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

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

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

In *collectivistic cultures*, however, the person is defined and understood primarily by looking at his or her place in the social unit (Fang et al., 2016; Moleiro et al., 2017; Saucier et al., 2015) (see **Study Tip**). Relatedness, connectedness, and interdependence are valued, as opposed to separateness, independence, and individualism. When asked to complete the statement "I am . . . ," people from collectivistic cultures tend to mention their families or nationality ("I am a daughter";

Study Tip

Reference Citations

Throughout this text, you will see citations to publications at the ends of many sentences. These citations—such as (Johnson, 2016)—give authors' names and the dates of their publications. Instructors rarely expect you to memorize the names and dates in parentheses. They are provided as a starting point for research projects, for additional information on a topic of interest, and to double-check the research sources. Complete publication information (title of article or chapter, author, journal name or book title, date, and page numbers) can be found in the References section provided with this text.

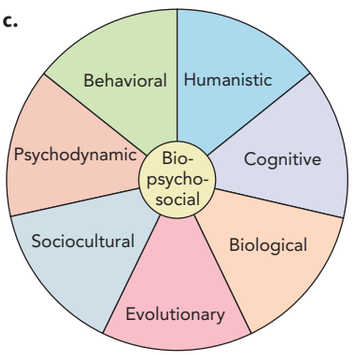
FIGURE 1.5 **The biopsychosocial model** When we consider people as individuals (**Figure a**), we don't always get a complete picture of their emotions and motivations. Stepping back to see the same individuals in a broader context (**Figure b**) can provide new insights. With this "bigger picture"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

a.

b.

© Bonnie Jacobs/iStockphoto

c.



Thiti Sukapan/Shutterstock

"I am Chinese"). Keep in mind, however, that these sample countries and their sample values exist on a continuum, and that within each country there is a wide range of individual differences.

Looking again at the photos from the cultures in Figure 1.5, do you recognize how learning more about the biopsychosocial model offers increased understanding of ourselves, our

TABLE 1.2 **A Comparison Between Individualistic and Collectivistic Cultures**

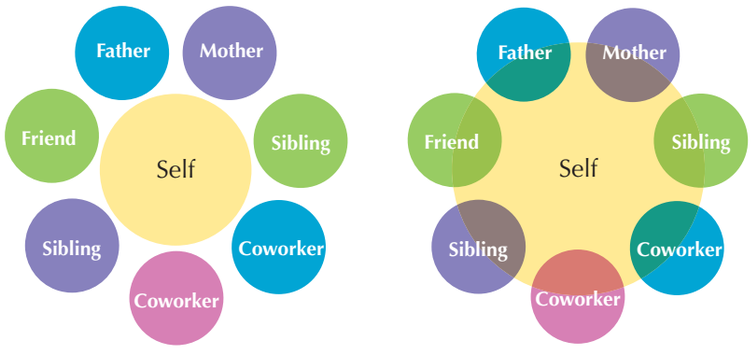
Sample Individualistic Countries	Sample Collectivistic Cultures
United States	Korea
Australia	China
Great Britain	India
Canada	Japan
The Netherlands	West Africa region
Germany	Thailand
New Zealand	Taiwan
Sample Individualistic Values	**Sample Collectivistic Values**
Independence	Interdependence
Individual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

Try This Yourself

Are You an Individualist or a Collectivist?

If asked to draw a circle with yourself in the center, and the people in your life as separate circles surrounding you, which of the two diagrams comes closest to your personal view?

If you chose (a), you probably have an *individualistic* orientation, seeing yourself as an independent, separate self. However, if you chose (b), you're more closely aligned with a *collectivist* culture, seeing yourself as interdependent and interconnected with others.



friends, and our families, and how it may improve our understanding and sensitivity to other cultures? For example, Americans generally define *sincerity* as behaving in accordance with our inner feelings, whereas people from collectivist cultures tend to see their equivalent word for sincerity as behavior that conforms to a person's role expectations and duties (Yamada, 1997). This explains why collectivistic behaviors might appear insincere to Americans.

❖ Psychology and Your Professional Success | Would You Like a Career in Psychology?

Many people think of psychologists only as therapists, and it's true that the fields of clinical and counseling psychology do make up the largest specialty areas. However, many psychologists have no connection with therapy. Instead, we work as researchers, teachers, or consultants in academic, business, industry, and government settings, or in a combination of settings (e.g., Roediger, 2017; Silvia et al., 2017; Sternberg, 2017). As you can see in **Table 1.3**, there are several career paths and valuable life skills associated with a bachelor's degree in psychology. Of course, your options are even greater if you go beyond the bachelor's degree and earn your master's degree, Ph.D., or Psy.D.—see **Table 1.4**. For more information about what psychologists do—and how to pursue a career in psychology—check out the websites of the American Psychological Association (APA) and the Association for Psychological Science (APS).

TABLE 1.3 What Can I Do with a Bachelor's Degree in Psychology?

Top Careers with a Bachelor's Degree in Psychology
Management and administration
Sales
Social work
Labor relations, personnel, and training
Real estate, business services, insurance
Sample Skills Gained from a Psychology Major
Improved ability to predict and understand behavior
Better understanding of how to use and interpret data
Increased communication and interpersonal skills
Increased ability to manage difficult situations and high-stress environments
Enhanced insight into problem behavior

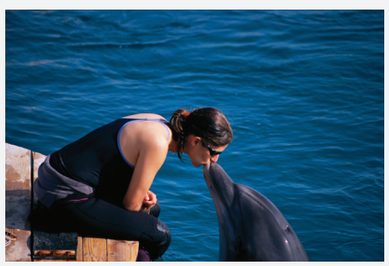
Note that the U.S. Department of Labor predicts only an average rate of growth for psychologists in the next decade. However, the good news is that a degree in our field, and this course in general psychology, will provide you with invaluable lifetime skills.

TABLE 1.4 Sample Careers and Specialties in Psychology

CAREER/SPECIALTY	DESCRIPTION
Biopsychologist/ neuroscientist	Investigates the relationship between biology, behavior, and mental processes, including how physical and chemical processes affect the structure and function of the brain and nervous system
Clinical psychologist	Specializes in the evaluation, diagnosis, and treatment of psychological disorders
Cognitive psychologist	Examines "higher" mental processes, including thought, memory, intelligence, creativity, and language
Comparative psychologist	Studies the behavior and mental processes of nonhuman animals; emphasizes evolution and cross-species comparisons
Counseling psychologist	Overlaps with clinical psychology, but generally works with less seriously disordered individuals and focuses more on social, educational, and career adjustment
Cross-cultural psychologist/ psychological anthropologist	Studies similarities and differences in and across various cultures and ethnic groups
Developmental psychologist	Studies the course of human growth and development from conception to death
Educational psychologist	Studies the processes of education and works to promote the academic, intellectual, social, and emotional development of children in the school environment
Environmental psychologist	Investigates how people affect and are affected by the physical environment
Experimental psychologist	Examines processes such as learning, conditioning, motivation, emotion, sensation, and perception in humans and other animals (Note that psychologists working in almost all other areas of specialization also conduct research.)
Forensic psychologist	Applies principles of psychology to the legal system, including jury selection, psychological profiling, assessment, and treatment of offenders
Gender and/or cultural psychologist	Investigates how men and women and different cultures vary from one another and how they are similar
Health psychologist	Studies how biological, psychological, and social factors affect health, 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/or their academic and social progress; also provides evaluation and assessment of a student's functioning and eligibility for special services
Social psychologist	Investigates the role of social forces in interpersonal behavior, including aggression, prejudice, love, helping, conformity, and attitudes
Sport psychologist	Applies principles of psychology to enhance physical performance

Rob Marmion/Shutterstock

Clinical and counseling psychology For most people, this is the role most commonly associated with psychology.



Jeffrey L. Rotman/Getty Images

Comparative and experimental psychology Research with human and nonhuman animals has provided valuable insights into behavior and mental processes.

Courtesy of Katherine Dowdell

Psychologists often wear many hats Professor Katherine Dowdell teaches full time at Des Moines Area Community College, serves as a department chair, and is a co-author of this text.

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Retrieval Practice 1.1 | Introducing Psychology

Completing this self-test and connections section, 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.

Self-Test

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. Define *critical thinking*.
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
5. The _____ views biological processes, psychological factors, and social forces as interrelated influences, and it is one of the most widely accepted themes of modern psychology.
   - **a.** eclectic perspective
   - **b.** nature-nurture model
   - **c.** interactionist position
   - **d.** biopsychosocial model

Connections—Chapter to Chapter

Answering the following questions will help you "look back and look ahead" to see the important connections among the various subfields of psychology and chapters within this text.

1. In the Prologue to this textbook, you learned about Critical Thinking Components (CTCs). Among these are distinguishing fact from opinion (behavioral), welcoming divergent views (affective), and synthesizing information (cognitive). Discuss how each of these CTCs is relevant to the study of psychology.
2. In Chapter 16 (Social Psychology), you'll discover some of the reasons why people choose to help each other. Using at least three of the seven modern perspectives of psychology, explain why a person might choose to help (or not to help) a person in need.

Study Tip

Each major topic concludes with Self-Test questions that allow you to stop and check your understanding of the key concepts just discussed. Our students have found that completing these questions greatly improves their test scores. Be sure to also provide your own answers to the Connections questions, and then compare all your answers with those provided in Appendix B provided with this text.

1.2 The Science of Psychology

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.

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

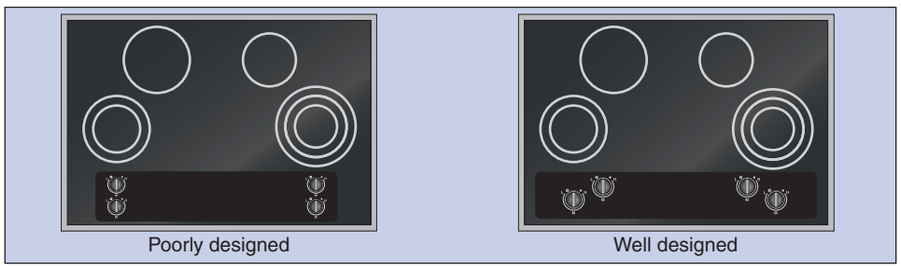
Basic and Applied Research

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 14 and 15, you'll also discover how *applied research* based on these principles has been used to successfully treat psychological disorders, such as phobias.

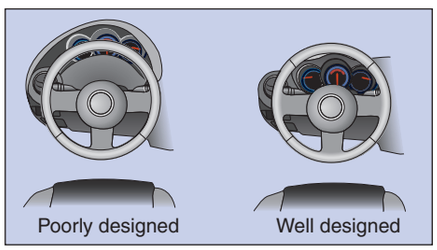
Basic research A type of research primarily conducted to advance core scientific knowledge; most often conducted in universities and research laboratories.

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

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



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



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

c. Arrangement of numbers A top-down arrangement of numbers on a cell phone is more efficient than the bottom-up arrangement on a computer's keyboard.

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.

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

The Scientific Method

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.

While conducting either basic or applied research, psychologists follow strict, standardized procedures so that others can understand, interpret, and repeat or test their findings. Most scientific investigations consist of six basic steps, collectively based on the **scientific method** (**Step-by-Step Diagram 1.1**). For example, are you wondering whether completing 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, is worth your time? Or if it will help you do better on exams?

Let's see how we might use the scientific method to answer these questions. Starting with Step 1, you would first *identify the question of interest*, which in this case is: "How might retrieval practice exercises affect exam grades?" As part of this identification, you need to clarify the specific factors your research will need to observe and measure—in this case, retrieval practice exercises and exam grades. Note that these specific factors are officially referred to as *variables*, which are simply any traits or conditions that can vary or change. 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.

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

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

To complete Step 2, you would need to form an educated guess based on your literature review in Step 1. You would then turn this guess into a statement, called a **hypothesis**, which provides predictions that can be tested in some way. You would need to explicitly state how each of the variables in your hypothesis will be **operationally defined** (observed and measured). For example, a

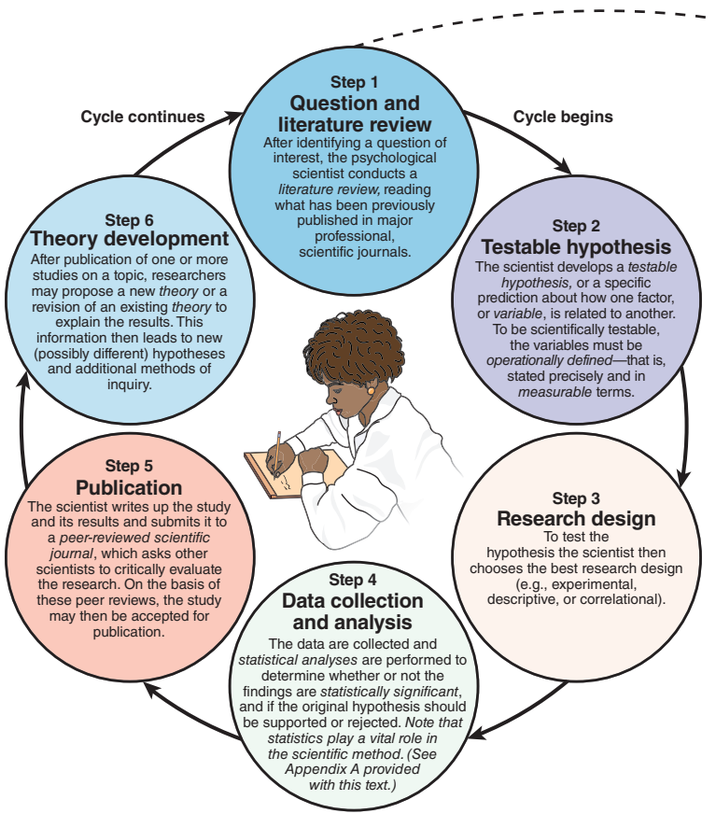
STEP-BY-STEP DIAGRAM 1.1 The Scientific Method

STOP! This Step-by-Step 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!

Study Tip

Research has shown that having access to 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 numerous step-by-step diagrams throughout this text.

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



Authors — Year study published — Title of study

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

Title of journal — Volume number — Page numbers

Checking references As a critical thinker, do you wonder where psychologists and other scientists publish their findings? Do you question the information found in this and your other college texts? If so, go to the References section provided with this text and you'll find specific, detailed information that will help you locate each reference cited throughout this text.

Study Tip

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

better grade on your exams might be operationally defined as earning one letter grade higher than the letter grade on your previous exam. Using your initial question about the value of the Retrieval Practice exercises, your hypothesis and operational definitions might be: "Students who spend two hours studying Chapter 1 in this text and one hour completing the Retrieval Practice exercises will earn higher scores on a standard academic exam than students who spend three hours studying Chapter 1 without completing the Retrieval Practice exercises."

For Step 3, you would most likely choose an experimental research design and solicit volunteers for your experiment. For instance, you might recruit 100 volunteers from various classes. Of these, you could randomly assign 50 to Group 1 (Retrieval Practice) and the other 50 to Group 2 (no Retrieval Practice). After having both groups study for three hours, you could present and score a 20-point quiz, followed by a statistical analysis (Step 4) to determine whether the difference in test scores between the two groups is **statistically significant**. To be statistically significant, the difference between the groups must be large enough that the result is probably not due to chance.

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

In Step 5, you could publish your research, and then you could go on to further investigate additional study techniques that might contribute to theory development on the most effective study methods, Step 6. [You'll be interested to know that research does exist on the superiority of retrieval practice in improving retention of material and exam scores (Carpenter & Yeung, 2017; Trumbo et al., 2016; Weinstein et al., 2016), which is 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)!]

Note also in Step-by-Step Diagram 1.1 that the scientific method is cyclical and cumulative. Scientific progress comes from repeatedly challenging and revising existing theories and building new ones. If numerous scientists, using different procedures or participants in varied settings, can repeat, or *replicate*, a study's findings, there is increased scientific confidence in the findings. If the findings cannot be replicated, researchers look for other explanations and conduct further studies. When different studies report contradictory findings, researchers may average or combine the results of all such studies and reach conclusions about the overall weight of the evidence, a popular statistical technique called **meta-analysis**. For example, as you'll discover in Chapter 11, a cross-cultural meta-analysis found that school-based programs teaching children about sexual abuse led to more children disclosing such abuse (Walsh et al., 2015).

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

As you can see in Step 6, after many related findings have been collected and confirmed, scientists may generate a **theory** to explain the data through a systematic, interrelated set of concepts. In common usage, the term *theory* is often assumed to mean something is only a hunch or someone's personal opinion. In reality, scientific theories are based on empirical evidence, rigorously tested, and self-correcting (**Figure 1.7**).

Theory A well-substantiated explanation for a phenomenon or a group of facts that have been repeatedly confirmed by previous research.

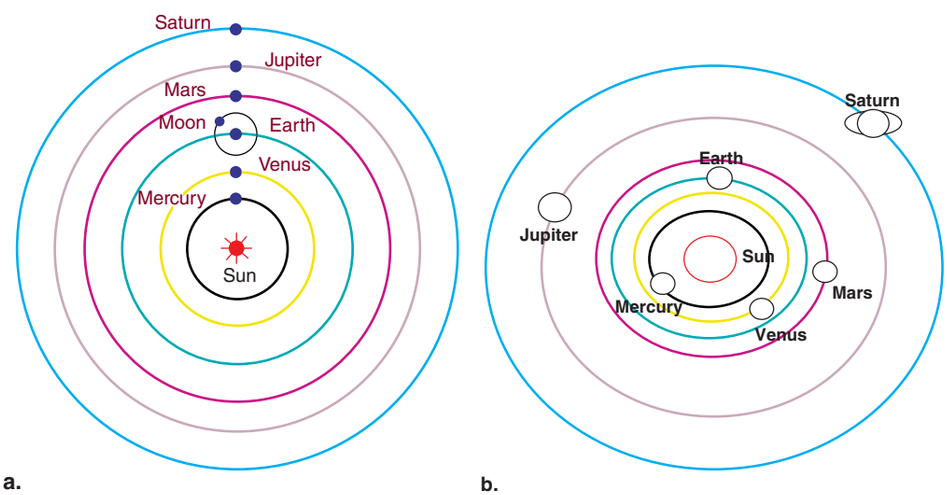


FIGURE 1.7 Opinions versus facts—science to the rescue! Early experiments, conducted primarily by Nicolaus Copernicus (1473–1543), led to a collection of facts and the ultimate theory that the Earth was not the center of the universe (as generally assumed at the time) **(Figure a)**. Instead, it rotated around the sun with the other planets in concentric circles. 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 **(Figure b)**. Today, researchers have expanded the theory even further by demonstrating that our sun is not the center of the universe, but only a part of a galaxy that in turn is only one of many billions. Can you see how these incremental changes illustrate the value of scientific theories and their ever-changing and self-correcting nature?

Psychology's Four Main Goals

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

1. **Description** Description tells what occurred. In some studies, psychologists attempt to *describe*, or name and classify, particular behaviors by making careful scientific observations. Description is usually the first step in understanding behavior. For example, if someone says, "Boys are more aggressive than girls," what does that mean? The speaker's definition of aggression may differ from yours. Science requires specificity.
2. **Explanation** An explanation tells why a behavior or mental process occurred. *Explaining* a behavior or mental process requires us to discover and understand its causes. One of the most enduring debates in science is the **nature–nurture controversy**. 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 (like all other sciences) generally avoids "either/or" positions and focuses instead on *interactions*. Today, almost all scientists agree that most psychological, and even physical, traits reflect an interaction between nature and nurture. For example, research suggests numerous interacting causes or explanations for aggression, including culture, learning, genes, brain damage, and testosterone (Bushman, 2016; Gerring & Vasa, 2016; Lippa, 2016).
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 is linked with aggression (e.g., Buchholz et al., 2017; Crane et al., 2016), we can predict that more fights will erupt in places where alcohol is consumed than in places where it isn't.
4. **Change** For some people, change as a goal of psychology brings to mind evil politicians or cult leaders brainwashing unknowing victims. However, to psychologists, *change* means applying psychological knowledge to prevent unwanted outcomes or bring about desired goals. In almost all cases, change as a goal of psychology is positive. Psychologists help people improve their work 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 (heredity) and nurture (environment) in determining the development of behavior and mental processes.

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 today 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:

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

- **Informed consent** Researchers must obtain **informed consent** 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 researchers and was not receiving any shocks). Although this study was testing participants' willingness to follow orders, they were told that the study was examining the use of shocks to assist with learning. Obviously, in this case, participants' behavior could not be accurately measured if they were told the real focus of the study. Therefore, researchers occasionally need to temporarily deceive participants about the actual reason for the experiment.

  However, when deception is necessary, ethical guidelines and restrictions still apply. One of the most important is **debriefing**, which is conducted once the data collection has been completed. The researchers provide a full explanation of the research, including its design and purpose and any deception used, and then 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 Nonhuman Animals

Nonhuman animals have long played an essential role in scientific research (**Figure 1.8**). Without nonhuman animals in *medical research*, how would we test new drugs, surgical procedures, and methods for relieving pain? In *psychological research*, nonhuman animals (mostly rats and mice) are used in only 7 to 8% of studies (APA, 2009; ILAR, 2009; MORI, 2005). Nevertheless, they have made significant contributions to almost every area of psychology—the brain and nervous system, health and stress, sensation and perception, sleep, learning, memory, motivation, and emotion. For example, an experiment with rats found that those 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?

Nonhuman animal research has also produced significant gains for some animal populations. Examples include the development of more natural environments for zoo animals and more successful breeding techniques for endangered species.

Despite the advantages, using nonhuman animals in psychological research remains controversial. While 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).

Jonathan Selig/Getty Images

FIGURE 1.8 Test your critical thinking

1. Nonhuman animals, like the mice in this photo, are sometimes used in psychological research when it would be impractical or unethical to use human participants. Do you believe nonhuman animal research is ethical? Why or why not?

2. What research questions might require the use of nonhuman animals? How would you ensure the proper treatment of these animals?

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 (Ethical Principles of Psychologists, 2016; Knapp et al., 2017). Therapists must also honor their clients' trust. All personal information and therapy records must be kept confidential. Furthermore, client records are only made available to authorized persons, and with

the client's permission. However, therapists are legally required to break confidentiality if a client threatens violence to him or herself or to others, if a client is suspected of abusing a child or an elderly person, and in other limited situations (Fisher, 2016; Gebhardt, 2016).

A Final Note on Ethical Issues What about ethics and beginning psychology students? Once friends and acquaintances know you're taking a course in psychology, they may ask you to interpret their dreams, help them discipline their children, or even ask your opinion 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 cumulative and continually being revised.

David L. Cole, a recipient of the APA Distinguished Teaching in Psychology Award, reminds us that, "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).

Try This Yourself

Want to Participate in Psychological Research?

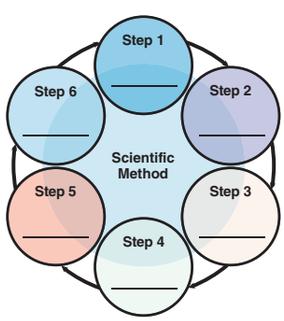
If you'd like more information about psychological research—or if you'd like to try participating in some research studies yourself—go to https://www.mturk.com/mturk/welcome. Through Amazon's *Mechanical Turk (MTurk)* online service, researchers all over the world post studies that need participants. You may get paid for participating, but more importantly, you'll be making a valuable contribution to psychological science!

Retrieval Practice 1.2 | The Science of Psychology

Completing this self-test and the connections section, 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.

Self-Test

1. Label the six steps in the scientific method.



2. A(n) _____ provides a precise definition of how the variables in a study will be observed and measured.
   a. meta-analysis **b.** theory
   c. independent observation **d.** operational definition

3. The goal of _____ is to tell what occurred, whereas the goal of _____ is to tell when.
   a. health psychologists; biological psychologists
   b. description; prediction
   c. psychologists; psychiatrists
   d. pseudopsychologists; clinical psychologists

4. Briefly explain the difference between a scientific theory, an opinion, and a hunch.

5. 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

Connections—Chapter to Chapter

Answering the following question will help you "look back and look ahead" to see the important connections among the various subfields of psychology and chapters within this text.

In the Prologue to this textbook, you learned about Critical Thinking Components (CTCs). For each of the six steps of the scientific method, list at least one CTC used in or demonstrated by that step.

1.3 Research Methods

LEARNING OBJECTIVES

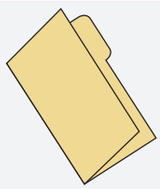
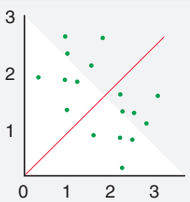
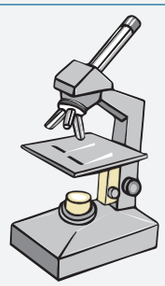
Retrieval Practice While reading the upcoming sections, respond to each Learning Objective in your own words.

Summarize psychology's three major research methods.

- **Review** descriptive research and its four key methods.
- **Discuss** correlational research and its limits and value.
- **Identify** the key terms and components of experimental research.

Having studied the scientific method and psychology's four main goals, we can now examine how psychologists conduct their research. Psychologists generally draw on three major research methods—*descriptive*, *correlational*, and *experimental*. Bear in mind that these major research methods all share several common goals: to gather information, generate research ideas, provide data for current and further studies, and communicate results. But, as you can see in **Table 1.5**, each of these approaches has advantages and disadvantages, and psychologists often use variations of all three methods to study a single problem. In fact, when multiple approaches lead to similar conclusions, scientists have an especially strong foundation for concluding that one variable does affect another in a particular way.

TABLE 1.5 Psychology's Three Major Research Methods

Method	Purpose	Advantages	Disadvantages	
Descriptive • Naturalistic observation • Survey/interview • Case study • Archival research	To observe and record behavior and mental processes	• Allows studies in real-world settings with real-world applications • Provides in-depth information on individuals and/or large groups • Offers data and ideas for future research • Meets psychology's goal of *description*	• Little or no control over variables • Potential biases • Cannot specify cause and effect • Single cases or large surveys may be misleading • Ethical and legal concerns over collection and use of data	
Correlational Statistical analyses of relationships between variables	To detect if two or more variables are related	• Allows studies in real-world settings with real-world applications • Identifies strength and direction of relationships • Offers data and ideas for future research • Meets psychology's goal of *prediction*	• Little or no control over variables • Potential biases • Cannot specify cause and effect • Possible illusory correlations and third-variable problems • Ethical and legal concerns over collection and use of data	
Experimental Manipulation and control of variables	To determine potential cause and effect	• Allows more precise control over variables • Permits causal explanation of behavior and mental processes • Meets psychology's goal of *explanation*	• Cannot manipulate or control certain variables • Potential biases • Results may not generalize to real-world settings • Ethical and legal concerns over use of data and manipulation of participants and certain variables	

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

Descriptive Research

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

Jeffrey Greenberg/Photo Researchers

FIGURE 1.9 Laboratory observation In this type of observation, the researcher brings participants into a specially prepared room, 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.

Naturalistic Observation

As the name implies, **naturalistic observation** involves systematic observation and recording of participants in their natural setting—without interference by the researchers. Such observations can be conducted in a wide variety of settings, from supermarkets to airports to outdoors. Their major function is to gather descriptive information about the typical behavior of people and nonhuman animals. For example, Jane Goodall's classic naturalistic observations of wild chimpanzees provided invaluable insights into their everyday lives, such as their use of tools, their acts of aggression, their demonstrations of affection, and, sadly, even their killing of other chimps' babies (infanticide). A recent observational study of humans 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? See Chapter 16 for the full story.

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

For a researcher who wants to observe behavior in a more controlled setting, *laboratory observation* has many of the advantages of naturalistic observation, but with greater control over the variables (**Figure 1.9**).

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*.

Naturalistic observation A descriptive research technique that observes and records behavior and mental processes in a natural, real-world setting.

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

Survey/Interview

Psychologists use **surveys/interviews** to ask people to report 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 pornography.

"The good news is we had a 100% reader response."

Cartoon Resource/Shutterstock

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 naturalistic observation. For rare disorders or phenomena, researchers

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

try to find someone who has the problem and study him or her intensively. This type of in-depth study of a single research participant, or a small group of individuals, is called a **case study**. In Chapter 2, we'll discuss the fascinating case study of Phineas Gage, who suffered a horrific brain injury, and in Chapter 9 we'll share a disturbing case study examining the effects of extreme childhood neglect and abuse. Such studies obviously could not be conducted using another method, for ethical reasons and because of the rarity of the conditions being studied.

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

Archival Research

The fourth type of descriptive research is **archival research**, in which researchers study previously recorded data. For example, 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 climbers 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 performance by preventing low-ranking team members from sharing their valuable insights and perspectives. (If you're wondering about how America ranked, we're a little below midpoint in hierarchical values.)

Interestingly, the new "digital democracy," based on spontaneous comments on Twitter or Facebook, may turn out to be an even better method of research than the traditional random sampling of adults. Researchers who used a massive archive of billions of stored data from Twitter found "tweet share" predicted the winner in 404 out of 435 competitive races in the U.S. House elections in 2010 (DiGrazia et al., 2013). Apparently, just the total amount of discussion—good or bad—is a very good predictor of votes.

Correlational Research

As you've just seen, data collected from descriptive research provides invaluable information on behavior and mental processes. The findings typically describe the dimensions of a phenomenon or behavior in terms of who was involved, what happened, and 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?

Correlational research A type of research that examines whether and how two or more variables change together; designed to meet the goal of *prediction*.

For example, a recent study found that as we get older, our job satisfaction tends to increase—yet over time within a given organization we become less satisfied (Dobrow et al., 2016). How can we explain this odd finding? Our job satisfaction apparently follows 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 studying and performance on exams. The researchers could then predict exam grades based on amount of studying. The researchers also could 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 (see **Concept Organizer 1.1**).

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

CONCEPT ORGANIZER 1.1 **Understanding the Role of Correlation Coefficients in Correlational Research**

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

As mentioned, *correlational research* examines whether and how two or more variables change together. Once researchers have collected measures on a group under study, they calculate a statistic known as a *correlation coefficient*. This number ranges from −1.00 to +1.00 and is commonly represented by the letter r, as in r = +.54 or r = −.32. As you'll see below, the + or − sign indicates the *direction* of the correlation, whereas the number (.54 or .32) indicates the *strength* of the correlation between two variables. Understanding what all of this means is crucial to becoming an educated consumer of research.

- **Direction of the correlation** Correlational research can produce three types of correlations that vary in different directions. As shown in **Figure 1.10** below, when two factors vary in the same direction (**Figure a**), meaning they increase or decrease together, it's called a *positive correlation*. When two factors vary in opposite directions (**Figure b**), with one increasing as the other decreases, it's known as a *negative correlation*. When there is NO relation between the two variables (**Figure c**), it's a *zero correlation*. The *plus* or *minus* sign in a correlation coefficient indicates the *direction* of the correlation, with plus indicating a positive correlation (as in +.07) and minus indicating a negative correlation (as in −.07). For a zero correlation, no sign is used (as in .00).

  Correlation coefficients are often depicted in graphs called *scatterplots*, a type of graph in which two variables are plotted along two axes (see again Figure 1.10). Note that each dot in a scatterplot represents the values of two variables for one participant. The pattern (or "scattering") of the plots reveals the direction of the correlation (positive, negative, or zero).

- **Strength of the correlation** Look again at the scatterplots in Figure 1.10, 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. Note in **Figure 1.11** (shown on the right) that as the number of the correlational coefficient decreases and gets closer to 0.00, the relationship weakens. In comparison, a correlation of +1.00 or −1.00 indicates the strongest possible relationship. And, once again, we interpret correlations close to zero as representing no relationship between the two variables.

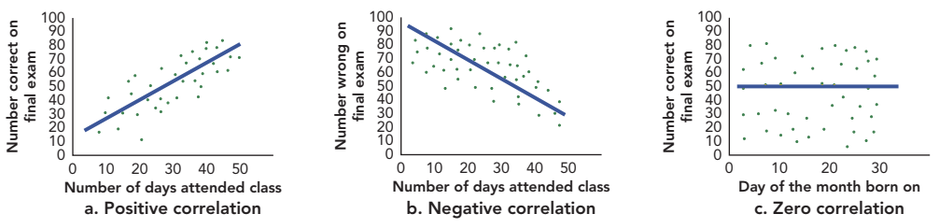


FIGURE 1.10 **Three types of correlation** Note that these are hypothetical graphs, but the results in **Figure a** and **Figure b** are consistent with research findings on the importance of class attendance (e.g., Putnam et al., 2016). For more details, see the *Tools for Student Success* section at the end of this chapter.

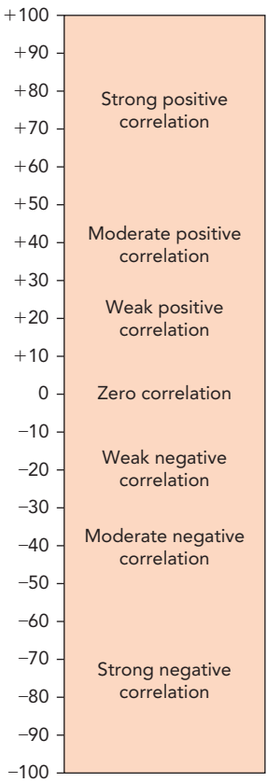


FIGURE 1.11 **Interpreting the strength of various correlation coefficients**

Try This Yourself

Test Your Understanding of Correlations

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

The Limits of Correlations

Correlations are sometimes misleading, confusing, or not particularly useful. In addition, the observation, recording, and data analyses from both descriptive and correlational studies can lead to ethical and legal concerns. For example, surveying or observing survivors after a terrorist attack and then using their data to make generalized predictions may lead to further trauma for the victims. Therefore, it's very important to note 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

wundervisuals/Getty Images

Don Mason/ Blend/Getty Images

FIGURE 1.12 The third-variable problem Ice cream consumption and drowning are highly correlated. Obviously, eating ice cream doesn't cause people to drown. A third factor, high temperatures, increases both ice cream consumption and participation in water-based activities.

Third-variable problem A situation in which a variable that has not been measured accounts for a relationship between two or more other variables; third variables are also known as confounding variables in experiments.

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

which is the effect—or whether other known or unknown factors may explain the relationship (**Figure 1.12**).

Consider this surprising positive correlation: Cities with a higher number of churches have a higher crime rate. Does this mean that an increase in churches leads to more crime? Of course not! Instead, a *third variable* (increased population) is the real source of the link between more churches and more crime.

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

2. **Observed correlations are sometimes illusory—meaning they don't exist!** In this second problem, there is NO factual, statistical connection between two variables—the relationship is the result of random coincidence and/or misperception. Popular beliefs, such as that infertile couples often conceive after an adoption, as well as the irrational fears behind certain anxiety disorders, are often based on **illusory** (false) **correlations** (Brodsky & Gutheil, 2016; Wiemer & Pauli, 2016). Can you see how someone with an intense fear of flying might misperceive the odds of crashes based on overly dramatic media reports? If you're confused about the differences between the third-variable problem and illusory correlations, see the **Study Tip**.

> **Study Tip**
>
> *Note that with the* third-variable problem, *an actual correlation does exist between two or more variables, but a third factor might be responsible for their connection. In contrast, with an* illusory correlation *there is NO measurable connection between two variables—the apparent connection is totally FALSE.*

Interestingly, superstitions, such as breaking a mirror supposedly leading to seven years of bad luck or sports fans wearing their lucky team sports jackets because they believe it will bring the team good luck, are additional examples of illusory correlations. We mistakenly perceive an association that factually does not exist. Unfortunately, these and other well-known superstitions (**Table 1.6**) persist despite logical reasoning and scientific evidence to the contrary.

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 causes of behavior. Paying undue attention to the dramatic (but very rare) instance when an infertile couple conceives after adoption or when a gambler wins a large payout on one specific slot machine is an example of the *saliency bias* (see Chapter 16). In addition to this saliency bias, we also more often note and remember events that confirm our expectations and ignore the "misses." This is known as the *confirmation bias*.

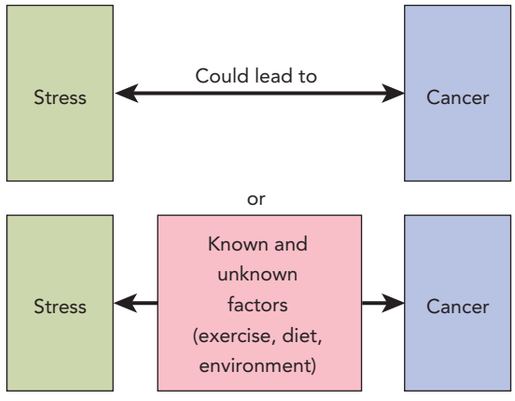
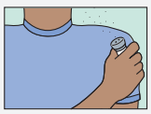
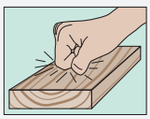


FIGURE 1.13 Correlation versus causation Research has found a strong correlation between stress and cancer (Chapter 3). Just as we can't tell whether the chicken or the egg came first, the correlation in this case does not tell us whether stress causes cancer, whether cancer causes stress, or whether other known and unknown factors, such as smoking, drinking, or pesticides, could contribute to both stress and cancer. Can you think of a way to study the effects of stress on cancer that is not correlational—and is still ethical?

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

TABLE 1.6 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 all the limits of correlational research, we need to emphasize that it's still an incredibly valuable research method, offering at least three major contributions:

1. **Prediction** A correlation can tell us if a relationship exists between two variables, which allows us to use one variable to predict scores on another. Consider a recent study that found a positive correlation between years of education and physical health. This correlation means that we can predict that as your educational level increases, your overall health 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 repeatedly observed over many years 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 healthier behaviors among the more highly educated, along with different thinking and decision-making patterns. If you'd like to explore how increased education might also affect your overall lifetime income, check out the "Media Challenge" for Chapter 1 located within the WileyPlus/Learning Space program.
2. **Real-world settings** A second value to correlational studies is that, like descriptive studies, they can be conducted in real-world settings that would otherwise be impossible or unethical to study. For example, smoking cigarettes and drinking alcohol while pregnant are highly correlated with birth defects (Doulatram et al., 2015; Mason & Zhou, 2015; Roozen et al., 2016). Conducting experiments on pregnant women would obviously be immoral and illegal. However, evidence from this strong correlation, along with other research, has helped convince many women to avoid these drugs while pregnant—likely preventing many birth defects. On a lighter note, research described in Chapter 3 reports 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 settings also often have practical applications. For example, many parents and professionals have repeatedly expressed concerns about the potential ill effects of Facebook and other social media sites on young people. In fact, a recent study compared 12 million Facebook users with nonusers and 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 also be good for our mental and physical health. 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.

3. **Future research** Finally, 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 be followed up with later experiments—the topic of our next section.

Experimental Research

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 variables (independent variables) to measure the effect on some behaviors or mental processes (dependent variables).

Independent variable (IV) The variable that is manipulated 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 possible change; the factor that is affected by (or dependent on) the independent variable.

Experimental group Participants in an experiment who receive the treatment under study—that is, those who are exposed to the independent variable (IV).

Control group Participants in an experiment who do NOT receive the treatment under study—that is, those who are NOT exposed to the independent variable (IV).

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.

As you've just seen, both descriptive and correlational studies are essential because they provide valuable data, insights, and practical applications. However, to determine *causation* (what causes what), we need **experimental research**. This research method is considered the "gold standard" for empirical science because only through an **experiment** can researchers manipulate and control variables to determine cause and effect (Cohen, 2014; Goodwin & Goodwin, 2013; Morling, 2015).

To understand the important key terms and the general setup for an experiment, imagine that you're a psychologist who wants to investigate how texting while driving affects the incidence of traffic accidents. To set up your imaginary experiment, carefully study **Step-by-Step Diagram 1.2**. Step 1 begins with the creation of a testable *hypothesis*, which we defined earlier as a tentative and testable explanation (or "educated guess") about the relationship between two or more variables. As part of this hypothesis, you need to note the specific factors (or variables) that will be observed and measured in your potential experiment. Experiments have two kinds of variables: *independent* and *dependent*. The factor, or *variable*, you manipulate (or change) is called the **independent variable (IV)**. The variable you plan to measure and examine for possible change is known as the **dependent variable (DV)**. In this case, the variable you manipulate (the IV) will be texting versus not texting, and the variable you measure for possible change (the DV) will be the number of traffic accidents.

For Step 2, you assign your research participants to either the **experimental group**, participants who receive the treatment under study, or the **control group**, participants who do NOT receive the treatment under study. Note that having two groups allows the performance of one group to be compared with that of the other. To minimize potentially critical differences between the two groups, you need to *randomly assign* participants to either the experimental group or the control group. **Random assignment** refers to the use of chance procedures (such as a coin toss or a random numbers table) to ensure that all participants have an equal opportunity to be in either group.

For Steps 3 and 4, you—the experimenter—will ask all participants to drive for a given amount of time (e.g., 30 minutes) in a driving simulator. While they're driving, you will record the number of simulated traffic accidents (the DV). [Note: The goal of any experiment is to learn how the dependent variable is *affected by* (depends on) the independent variable.]

During Step 5, you'll compare the results from both groups and report your findings to a peer-reviewed scientific journal like the ones found in the References section provided with this text. Keep in mind that because the control group was treated exactly like the experimental group, except for the IV, any significant difference in the number of traffic accidents (the DV) between the two groups would be the result of the IV. In contrast, if you found little or no difference between the groups, you would conclude that texting does not affect traffic accidents.

Before going on, note that actual research does find that cell phone use, particularly texting, while driving definitely leads to increased accidents and potentially serious or fatal consequences (e.g., Carney et al., 2016; Yannis et al., 2016). In other words: "Let's all just put down the phone and drive."

Research Problems and Safeguards

As you've seen, descriptive, correlational, and experimental research methods all have serious limits and potential biases. To offset these problems, researchers must establish several safeguards to protect against potential sources of error from both the researcher and the participant.

STEP-BY-STEP DIAGRAM 1.2 Experimental research design

STOP! This Step-by-Step 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!

Study Tip

To help you remember the independent and dependent variables (IV and DV), note that the IV is called independent because it is controlled and manipulated by the experimenter. The DV is called dependent because the behavior (or outcome) exhibited by the participants is assumed to depend on manipulations of the IV. You might find it helpful to carefully study these drawings and create a visual picture in your own mind of how:

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

and then the experimenter "measures" the DV, which "depends" on the IV.

When designing an experiment, researchers must follow certain steps to ensure that their results are scientifically meaningful. In this example, researchers want to test whether people texting on cell phones while driving have more traffic accidents than those who don't text while driving.

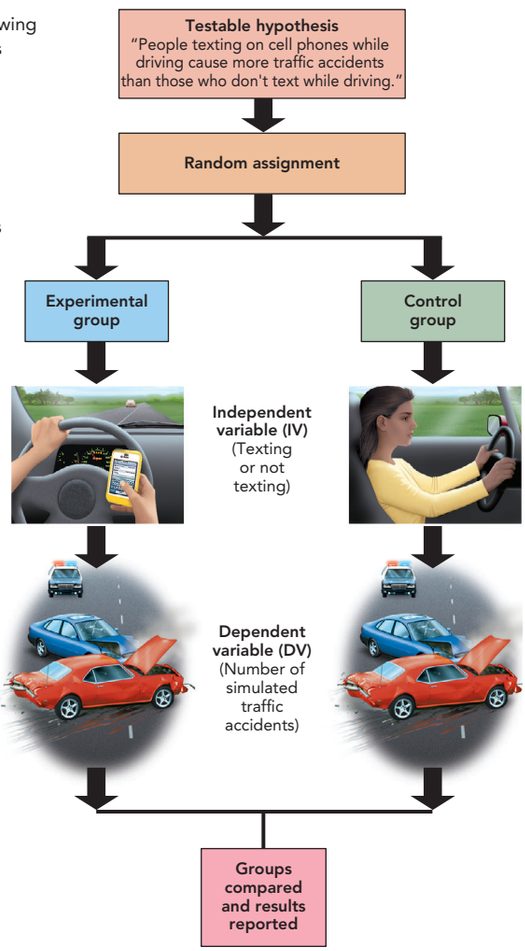
Step 1 After identifying the IV and DV and reviewing the literature, the experimenter develops a testable hypothesis.

Step 2 Next, the experimenter randomly assigns participants to one of two different groups—*experimental* or *control*. Having an experimental group, which receives the treatment, and a control group, which does not receive the treatment, allows a baseline comparison of responses between the two groups.

Step 3 Next, both the experimental and 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 is the independent variable (IV). And the number of simulated traffic accidents is the dependent variable (DV).

Step 4 The experimenter counts the number of simulated traffic accidents for each group and then analyzes the data.

Step 5 The experimenter compares the results from both groups, writes up his or her report, and submits it to scientific journals for possible publication.



Potential Researcher Issues

Let's start with **sample bias**, which occurs when the researcher recruits and/or selects participants who do not accurately reflect the composition of the larger population from which they are drawn. For example, some critics suggest that

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

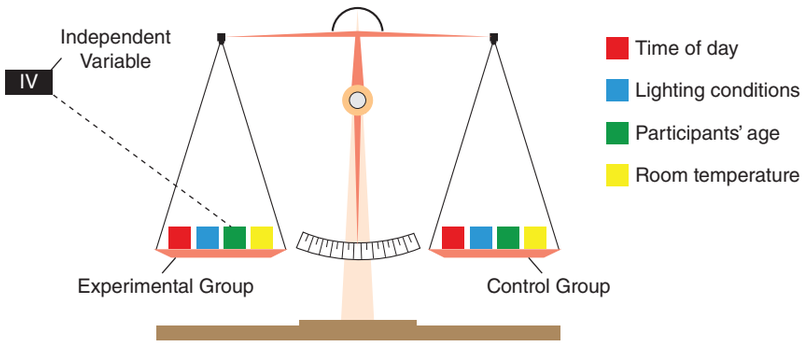


FIGURE 1.14 Controlling for confounding variables Recognizing that certain outside variables may affect their experimental findings, researchers strive for balance between the experimental and control groups, making sure the variables are the same for both. Once balance is achieved, and the independent variable (IV) is added to the experimental group, the experimenters check to see if the scale's balance is significantly disrupted. If so, they can then say that the IV *caused* the change. However, if the IV is not "heavy" enough to make a significant difference, then the experiment "failed," and experimenters go back to further refine their approach, start over, or go on to a new project.

Representative sample A selected sample of participants whose demographics and characteristics accurately reflect the entire population of interest.

Confounding variable An extraneous factor or variable that, if not controlled, could confuse, or *confound*, the effects of the independent variable (IV) and contaminate the results of an experiment; also known as the third-variable problem in correlational research.

psychological literature is biased because it too often uses college students as participants. We can counteract potential sample bias by selecting participants who constitute a **representative sample** of the entire population of interest.

It's also critical to control for extraneous, **confounding variables** (such as time of day, lighting conditions, and room temperature). These variables must be held constant across both the experimental and control groups. Otherwise, if not controlled, these variables might confuse, or *confound*, the effects of the independent variable (IV)—thereby contaminating your research results (**Figure 1.14**). As discussed earlier, *random assignment* also helps control for confounding variables (see the **Try This Yourself**).

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

Try This Yourself

Understanding Random Assignment and Confounding Variables

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

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

Experimenter bias A bias that occurs when a researcher influences research results in the expected direction.

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.

In addition, if experimenters' beliefs and expectations are not controlled for, they can affect participants' responses, producing flawed results. Imagine what might happen if an experimenter breathed a sigh of relief when a participant gave a response that supported the researcher's hypothesis. A good example of this comes from the case of *Clever Hans*, the famous mathematical "wonder horse" (**Figure 1.15**). One way to prevent such **experimenter bias** from destroying the validity of participants' responses is to establish objective methods for collecting and recording data, such as using "blind" observers with no direct connection to the research and/or computers to present stimuli and record responses.

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

Potential Participant Issues

We've seen that researchers can inadvertently introduce error (the experimenter bias). Unfortunately, participants can produce a similar error, called **participant bias**. For example, researchers often use surveys as their main research method or as part of an experiment. And, as you might expect, when participants are asked to self-report on sensitive topics, such as their sexual behaviors or drug and alcohol consumption, they often attempt to present themselves in a favorable way, rather than giving true accounts. This tendency to over-report "good behaviors" and to under-report "bad behaviors" is aptly named the *social desirability* response (see the following **Research Challenge**).

vikarus/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. Do you see how this provided an early example of experimenter bias?

Participant bias A bias that occurs when a research participant contaminates research results.

Research Challenge

Why Do Men and Women Lie About Sex?

The *social desirability bias* is of particular concern when we study sexual behaviors. A fascinating example comes from a study that asked college students to complete a questionnaire regarding how often they engaged in 124 different gender-typical behaviors (Fisher, 2013). Some of these behaviors were considered more typical of men (such as wearing dirty clothes and telling obscene jokes), whereas other behaviors were more common among women (such as writing poetry and lying about their weight). Half of the participants completed these questionnaires while attached to what they were told was a polygraph machine (or lie detector), although in reality this machine was not working. The other half completed the questionnaires without being attached to such a machine.

Can you predict how students' answers differed as a function of their gender and whether they were (or were NOT) attached to the supposed lie detector? Among those who were attached to a supposed lie detector and who believed that it could reliably detect their lies, men were more likely to admit that they sometimes engaged in behaviors seen as more appropriate for women, such as writing poetry. In contrast, women were more likely to admit that they sometimes engaged in behaviors judged more appropriate for men, such as telling obscene jokes. Even more interesting, men reported having had more sexual partners when they weren't hooked up to the lie detector than when they were. The reverse was true for women! They reported fewer partners when they were not hooked up to the lie detector than when they were.

How does the *social desirability response* help explain these differences? We're all socialized from birth to conform to norms (unwritten rules) for our culturally approved male and female behaviors. Therefore, participants who were NOT attached to the supposed lie detector provided more "gender appropriate" responses. Men admitted telling obscene jokes and reported having more sexual partners, whereas women admitted lying about their weight and reported having fewer sexual partners.

These findings were virtually reversed when participants believed they were connected to a machine that could detect their lies. This fact provides a strong example of the dangers of the social desirability response. It also reminds us, as either researchers or consumers, to be very careful when interpreting findings regarding sexual attitudes and behaviors. Gender roles may lead to inaccurate reporting and exaggerated gender differences.

Inti St Clair/Getty Images

Test Yourself

1. **Based on the information provided, did this study (Fisher, 2013) use descriptive, correlational, and/or experimental research?**
2. **If you chose:**
   - ***descriptive research*, is this a naturalistic 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 it as a *quasi-experimental design*.)**
   - **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 critical thinker and consumer of scientific research.

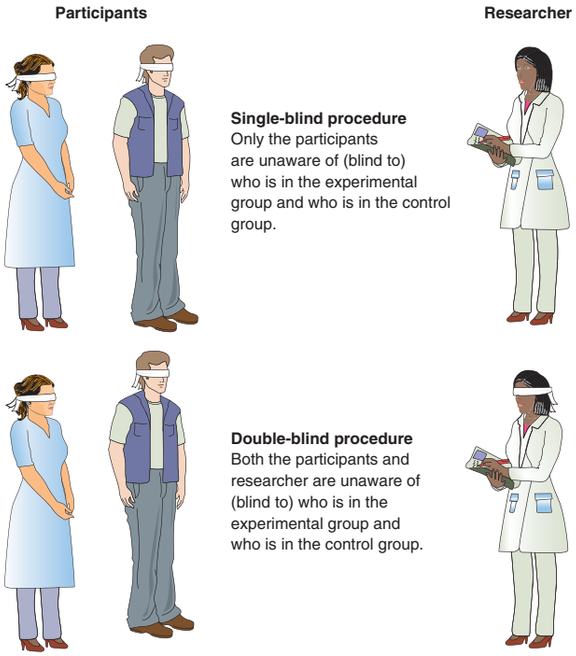


FIGURE 1.16 A single- or double-blind experimental design In an experiment to test a new drug, the participants taking the drug, and possibly the researchers as well, must be unaware of (or "blind" to) who is receiving a *placebo* (a fake pill) and who is receiving the drug itself. This is necessary because researchers know that participants' beliefs and expectations can change their responses and the experimental outcome—the so-called "placebo effect" (Brown, 2013; Dragan-ich & Erdal, 2014).

Additional Research Safeguards

Scientists attempting to minimize both experimenter and participant bias often use **single-blind** and **double-blind studies**. As you can see in **Figure 1.16**, this approach requires that participants, and sometimes also experimenters, be unaware of (or "blind" to) the treatment or condition to which the participants have been assigned.

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

Also, as you discovered in the previous section on ethical guidelines, researchers attempt to control for participant bias by offering anonymous participation, along with guarantees of privacy and confidentiality. In addition, one of the most effective (and controversial) ways of preventing participant bias is to temporarily deceive participants about the true nature of the research project. For example, in studies examining when and how people help others, participants may not be told the true goal of the study because they might try to present themselves as more helpful than they actually would be in real life—another example of the social desirability response.

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

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

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

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

Quasi-Experimental Designs

Given the numerous limits and problems with the experimental method we've just described, 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. For example, 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 can't randomly assign fathers to either the present-at-birth condition or the absent-at-birth condition. Recognizing that assessing the differences between the two groups still might provide important information, experimenters can compare the two groups without random assignment, and it would then be officially called a quasi-experimental design. Why can't quasi-experimental designs make the same strong claims for causation that could be made based on true experiments? Without random assignment, uncontrolled third variables might skew the results.

Take-Home Message

We've just presented a large number of research problems and safeguards associated with the various research methods (descriptive, correlational, and experimental), and we've gathered them all into **Figure 1.17**. Be sure to study it carefully.

Given all these problems, should we simply pack our bags and go home? Of course not! Psychological research does have its limits, but having a general understanding of research