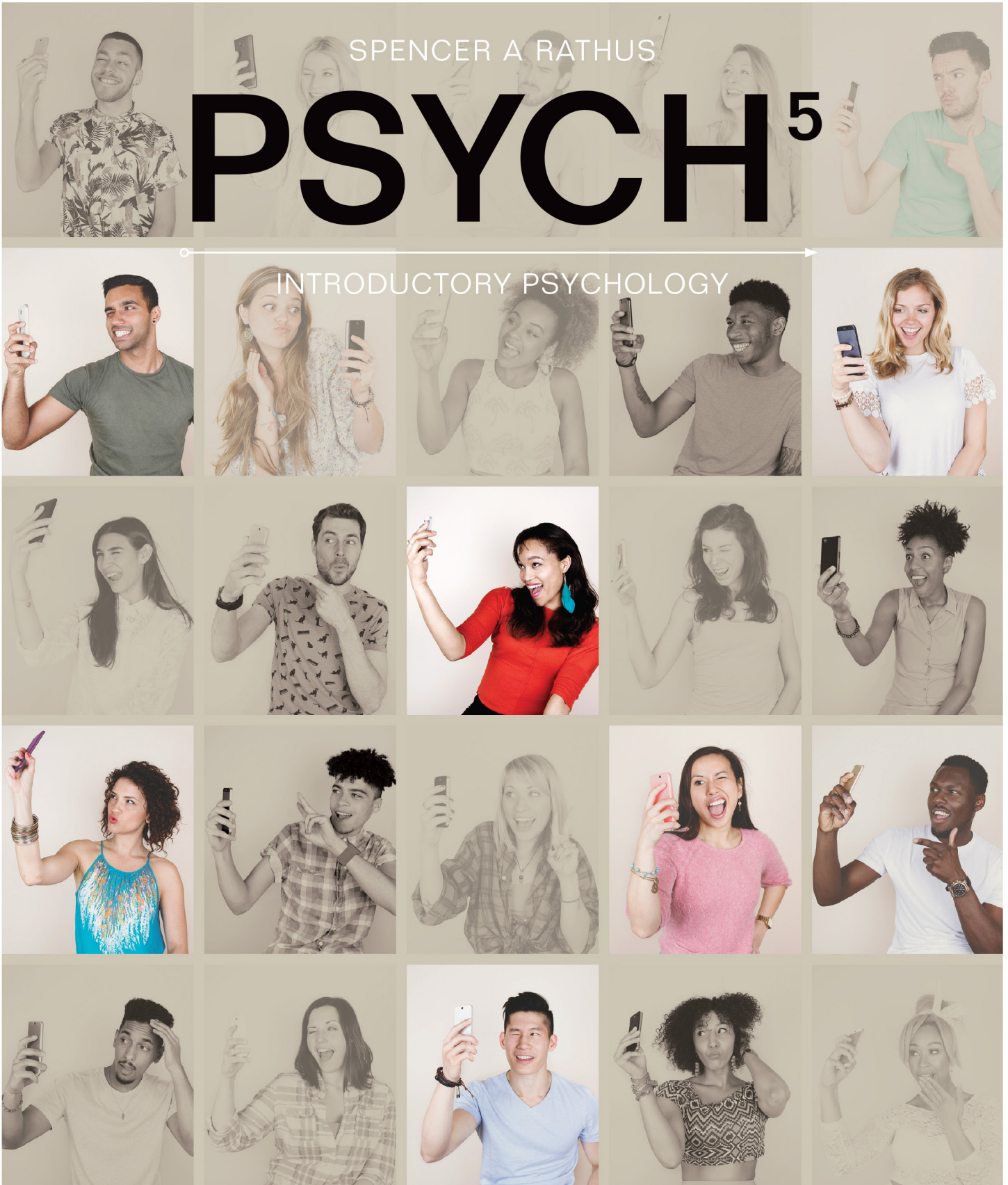


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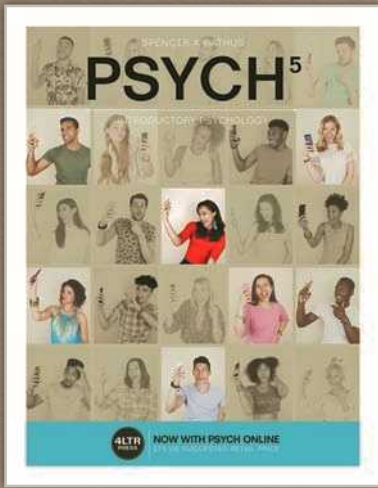
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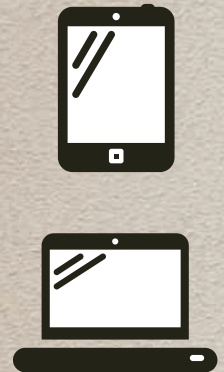
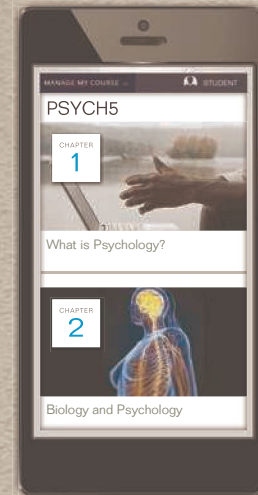
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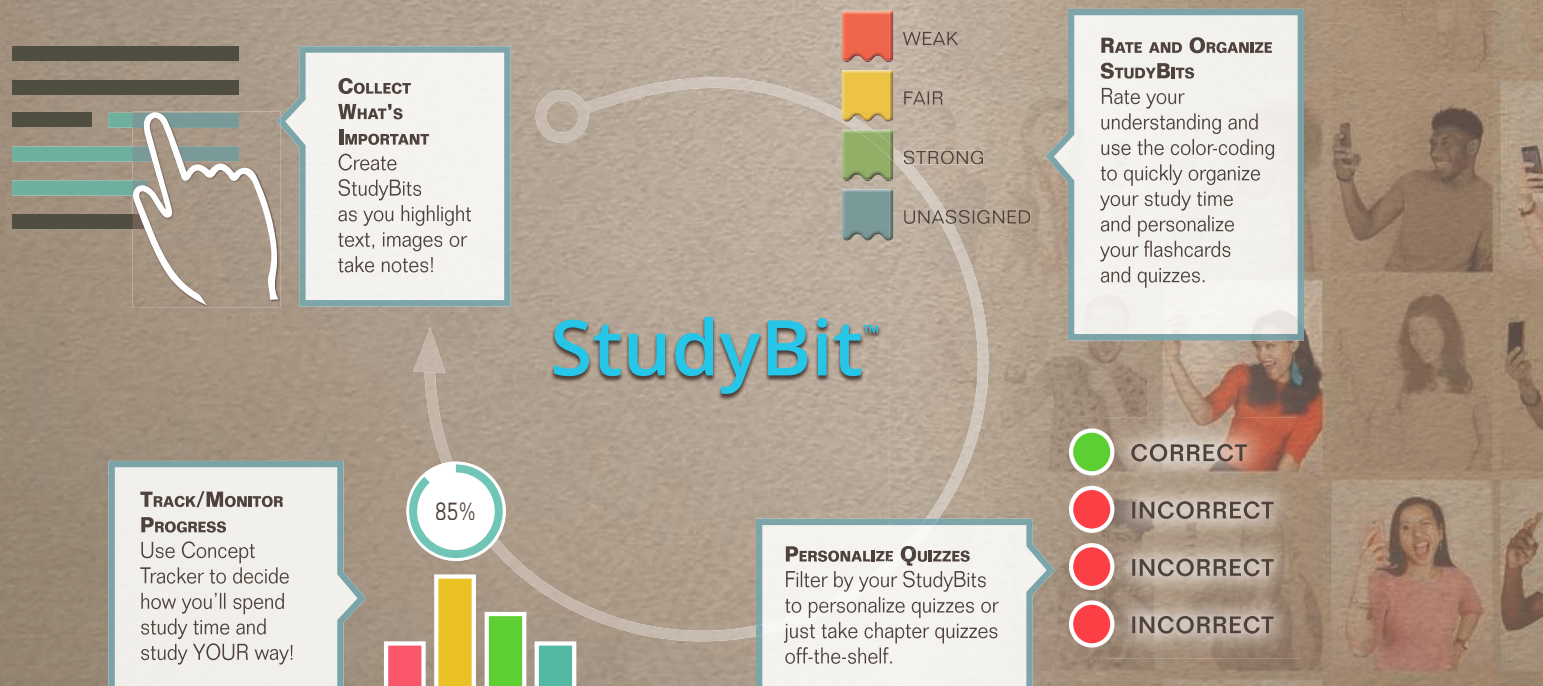
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BRIEF CONTENTS



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1	What Is Psychology?	2
2	Biology and Psychology	30
3	Sensation and Perception	62
4	Consciousness	92
5	Learning	120
6	Memory: Remembrance of Things Past—and Future	146
7	Thinking, Language, and Intelligence	174
8	Motivation and Emotion	204
9	The Voyage through the Life Span	232
10	Personality: Theory and Measurement	260
11	Stress, Health, and Coping	286
12	Psychological Disorders	308
13	Methods of Therapy	334
14	Social Psychology	358
Appendix: Statistics 386		
Answers to StudyTools Questions 400		
References 402		
Index 427		

CONTENTS



1 What Is Psychology? 2

- 1-1 Psychology as a Science 4
- 1-2 Historical Foundations of Psychology 7
- 1-3 Contemporary Perspectives in Psychology 11
- 1-4 How Psychologists Study Behavior and Mental Processes 15
- 1-5 Methods of Research 18
- 1-6 Ethics in Psychological Research 23
- 1-7 Critical Thinking 24

2 Biology and Psychology 30

- 2-1 The Nervous System: On Being Wired 32
- 2-2 The Divisions of the Nervous System 38
- 2-3 The Brain: Wider than the Sky 41
- 2-4 A Voyage through the Brain 43
- 2-5 The Cerebral Cortex 46
- 2-6 The Endocrine System 49
- 2-7 Evolution and Heredity 52

3 Sensation and Perception 62

- 3-1 Sensation and Perception 63
- 3-2 Vision 67
- 3-3 Visual Perception 73

- 3-4 Hearing 80
- 3-5 The Other Senses 84
- 3-6 ESP: Is there Perception without Sensation? 87

4 Consciousness 92

- 4-1 What is Consciousness? 93
- 4-2 Sleep and Dreams 96
- 4-3 Altering Consciousness: Hypnosis, Meditation, and Biofeedback 102
- 4-4 Altering Consciousness through Drugs 106
- 4-5 Depressants 108
- 4-6 Stimulants 110
- 4-7 Hallucinogenics 114

5 Learning 120

- 5-1 Learning, Experience, and Change 121
- 5-2 Classical Conditioning: Learning What is Linked to What 122
- 5-3 Applications of Classical Conditioning 126
- 5-4 Operant Conditioning: Learning What does What to What 129
- 5-5 Applications of Operant Conditioning 136
- 5-6 Cognitive Factors in Learning 138

6 Memory: Remembrance of Things Past—and Future 146

- 6-1 Kinds of Memory 147
- 6-2 Processes of Memory 150
- 6-3 Sensory Memory 153
- 6-4 Short-Term Memory 154
- 6-5 Long-Term Memory 157
- 6-6 Forgetting 161
- 6-7 The Biology of Memory 167



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7 Thinking, Language, and Intelligence 174

- 7-1 Thinking 175
- 7-2 Language 181
- 7-3 Language Development: The Two-Year Explosion 185
- 7-4 Theories of Intelligence 189
- 7-5 The Measurement of Intelligence 193
- 7-6 Nature and Nurture in Intelligence 198

8 Motivation and Emotion 204

- 8-1 The Psychology of Motivation 205
- 8-2 Theories of Motivation 206
- 8-3 Hunger 209
- 8-4 Sexual Motivation and Sexual Orientation 214
- 8-5 Achievement Motivation 219
- 8-6 Emotion 220
- 8-7 Theories of Emotion 224

9 The Voyage through the Life Span 232

- 9-1 Prenatal Development 233
- 9-2 Childhood: Physical Development 235
- 9-3 Childhood: Cognitive Development 237
- 9-4 Childhood: Social and Emotional Development 244
- 9-5 Adolescence 247
- 9-6 Emerging Adulthood 251
- 9-7 Adulthood 252

10 Personality: Theory and Measurement 260

- 10-1 The Psychodynamic Perspective 262
- 10-2 The Trait Perspective 268
- 10-3 Learning-Theory Perspectives 271
- 10-4 The Humanistic–Existential Perspective 273
- 10-5 The Sociocultural Perspective 277
- 10-6 Measurement of Personality 279

11 Stress, Health, and Coping 286

- 11-1 Stress: What it is, Where it Comes from 288
- 11-2 Psychological Moderators of Stress 293
- 11-3 Stress and the Body 295
- 11-4 Psychology and Chronic Health Problems 299

12 Psychological Disorders 308

- 12-1 What are Psychological Disorders? 309
- 12-2 Anxiety Disorders 312
- 12-3 Obsessive–Compulsive and Related Disorders 315
- 12-4 Trauma- and Stressor-Related Disorders 316
- 12-5 Dissociative Disorders 317
- 12-6 Somatic Symptom and Related Disorders 318
- 12-7 Mood Disorders 319
- 12-8 Schizophrenia and Other Psychotic Disorders 324
- 12-9 Personality Disorders 328



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13 Methods of Therapy 334

- 13-1 What is Psychotherapy? 336
- 13-2 Psychodynamic Therapies 338
- 13-3 Humanistic Therapies 339
- 13-4 Behavior Therapy 341
- 13-5 Cognitive Therapies 345

- 13-6 Group Therapies 347
- 13-7 Does Psychotherapy Work? 349
- 13-8 Biological Therapies 352

14 Social Psychology 358

- 14-1 Attitudes 360
- 14-2 Prejudice and Discrimination 364
- 14-3 Attraction and Love 365
- 14-4 Social Perception 368
- 14-5 Social Influence 370
- 14-6 Aggression 375
- 14-7 Group Behavior 377

Appendix: Statistics 386

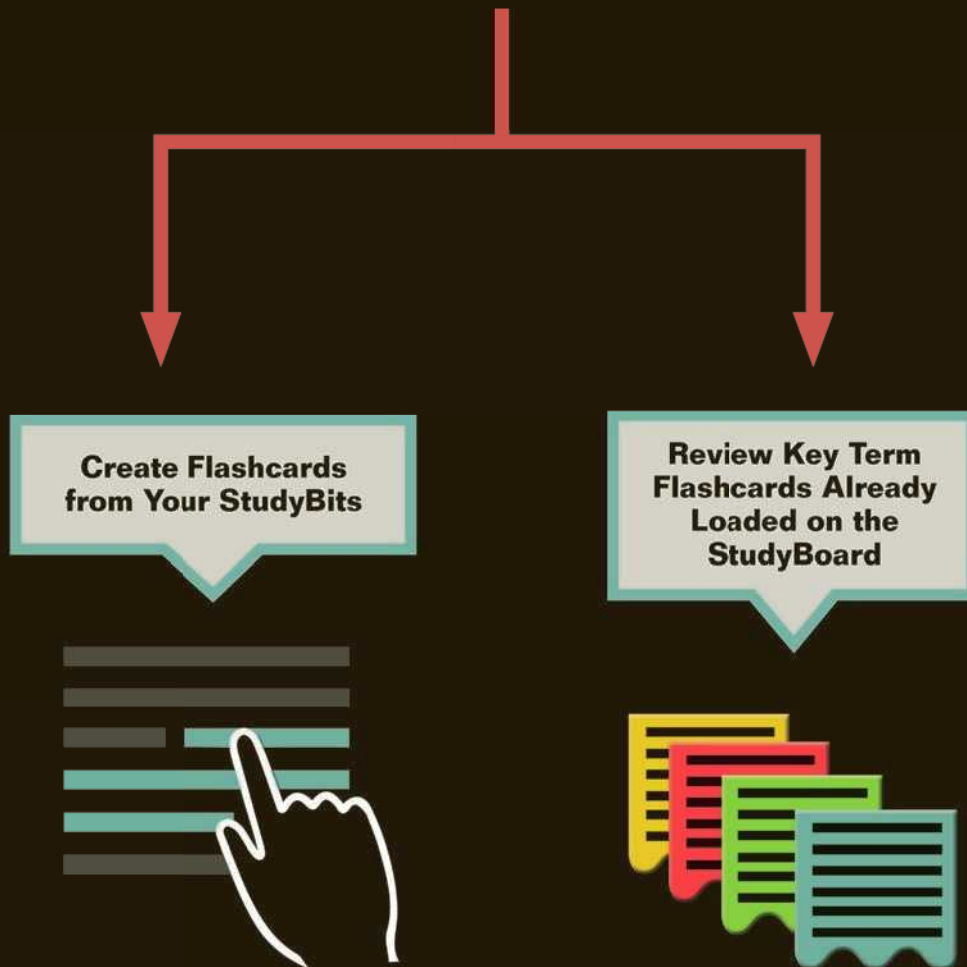
Answers to Study Tools Questions 400

References 402

Index 427

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1

What Is Psychology?

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LEARNING OUTCOMES

After studying this chapter, you will be able to...

- 1-1 Define psychology and describe what psychologists do.
- 1-2 Describe the origins of psychology and discuss people who have made significant contributions to the field.
- 1-3 Identify the theoretical perspectives from which psychologists today view behavior and mental processes.
- 1-4 Outline the scientific method, and explain the relationship between samples and populations.
- 1-5 Explain how psychologists engage in research—including methods of observation, correlation, and experimentation—to learn about behavior and mental processes.
- 1-6 Discuss ethical standards that govern psychological research and practice with humans and animals.
- 1-7 Identify and discuss principles of critical thinking.

After you finish this chapter, go to **PAGE 25** for **STUDY TOOLS**

My favorite place: The checkout counter of the supermarket. After being buffeted about by the crowds in the aisles and trying to convince myself that I really will survive until the people in line ahead of me are checked out, I am rewarded by the display of all the supermarket tabloids. The headlines cry out. Each week, there are 10 new sightings of Elvis and 10 new encounters with extraterrestrials. There are 10 new “absolutely proven effective” ways to take weight off and 10 new ways to conquer stress and depression. There are 10 new ways to tell if your partner has been cheating and, of course, 10 new predictions by astrologers and psychics.

Extraterrestrials regularly kidnap us Earthlings. Although they possess the technology to leap between the stars, aliens must apparently prod and poke us to figure out how we work. While we update our iPhones with the latest apps and music, tabloid drawings suggest that aliens have been flying the same model flying saucer for decades. Their sense of style is nothing to text home about.

Although we can find some humor in tales of abduction by aliens, psychologists and other scientists are interested in the questions these tales raise about human nature and the distinction between sensationalism and science. What do we know about people who claim to have been abducted by aliens? How can we sort truth from fiction and decide whether we will believe them?

Psychologists who have studied claimed alien kidnappings conclude that the kidnappings never occurred. However, the people making the claims are not necessarily mentally ill, nor are they necessarily lying (Ladd & Borshuk, 2013). By and large, these are people who have



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Truth or Fiction.

The world is flooded with sense and nonsense. How can you sort out truth from fiction?

remembered their experiences while undergoing therapy, often under hypnosis. Tales of alien abduction are widely known throughout our culture, so it is not at all surprising that the “memories” of people who claim to have been inducted by aliens would tend to coincide (Meyersburg et al., 2009; Swami et al., 2009).

Abductees generally claim that they are awakened in their sleep by the aliens and unable to move. Psychologists know that many of our voluntary muscles—the ones involved in movement—are “paralyzed” when we sleep, which is why we usually don’t thrash about

(and assault our bed partners) when we dream (Torontali et al., 2014). *Hallucinations*—seeing and hearing things that are not really there—are quite common as we are waking from a sleep-paralyzed state, and it seems that the reported experiences of “abductees” fit the pattern.

TRUTH OR FICTION?

WHAT DO YOU THINK? FOLKLORE, COMMON SENSE, OR NONSENSE? SELECT T FOR “TRUTH” OR F FOR “FICTION,” AND THEN CHECK THE ACCURACY OF YOUR ANSWERS AS YOU READ THROUGH THE CHAPTER.

- T F** More than 2,000 years ago, Aristotle wrote a book on psychology with contents similar to those in the book you’re now reading.
- T F** The ancient Greek philosopher Socrates suggested a research method that is still used in psychology.
- T F** Men receive the majority of doctoral degrees in psychology.
- T F** Even though she had worked to complete all the degree requirements, the first female president of the American Psychological Association turned down the doctoral degree that was offered to her.
- T F** You could survey millions of voters and still not accurately predict the outcome of a presidential election.
- T F** In many experiments, neither the participants nor the researchers know who is receiving the real treatment and who is not.

Psychologists also know that people are quite open to suggestion (Bernstein & Loftus, 2009; Vyse, 2014). Memories are not perfect snapshots. When trial witnesses are asked leading questions—questions that might encourage them to recall events in a certain way—the opposing attorney will usually object (“Leading the witness, your Honor”). Sometimes, the person interviewing the supposed kidnap victim asks leading questions, looking for experiences with aliens.

All in all, “UFO memories may be constructed from bits and pieces of sleep-related hallucinations, nightmares, and media attention, and fixed solidly into place with the suggestion of hypnosis and the validation of support groups” (Clark & Loftus, 1996). “Abductees” may also be trying to escape, temporarily, from their humdrum lives—as might be buyers of supermarket tabloids (Clancy et al., 2002).

Psychologists have thus worked to explain how it can be that many people report being abducted

by aliens and being subjected to tests by them. But is there *scientific evidence* that people have been abducted by aliens? In sum, when we subject the stories in the supermarket tabloids to scientific analysis, we usually find that they fall short of any reasonable requirements of evidence.

This book will take you on a journey. It’s not a journey into outer space. It’s a journey into the inner space of thinking critically about the world around you, about stories and arguments made by other people, about human behavior and mental processes. In our overview of reported alien abductions, we touched on people’s memories, the state of consciousness known as sleep, hallucinations, hypnosis, the search for stimulating events, social influences on witnesses, and the effects of social support and the media. All these, and much, much more, lie within the province of psychology. We will see who psychologists are, what they do, what they have learned, and perhaps most important, how they sort out truth from fiction.

1-1 PSYCHOLOGY AS A SCIENCE

Psychology is the scientific study of behavior and mental processes. Topics of interest to psychologists include the nervous system, sensation and perception, learning and memory, intelligence, language, thought, growth and development, personality, stress and health, psychological disorders, ways of treating those disorders, sexual behavior, and the behavior of people in social settings such as groups and organizations.

Sciences have certain goals. Psychology, like other sciences, seeks to describe, explain, predict, and control the events it studies. Psychology thus seeks to describe, explain, predict, and control behavior and mental processes. Note that the goal of *controlling* behavior and

mental processes doesn’t mean that psychologists seek ways to make people do their bidding, like puppets on strings. Rather, psychologists seek to understand the factors that influence

behavior and apply this knowledge for the public good—for example, to help individuals cope with problems such as anxiety and depression.

When possible, descriptive terms and concepts—such as anxiety and depression—are interwoven into **theories**. Theories propose reasons for relationships among events, as in perception of a threat can arouse feelings of anxiety. They allow us to derive explanations and predictions. Many psychological theories combine statements about behavior (such as eating or aggression), mental processes (such as attitudes and mental images), and biological processes. For instance, many of our responses to drugs such as alcohol and marijuana can be measured as overt behavior, and they are presumed to reflect our (mental) expectations of the drugs and the biological effects of the drugs themselves.

A satisfactory psychological theory allows us to predict behavior. For instance, a theory of hunger should allow us to predict when people will or will not eat. If our observations cannot be adequately explained by, or predicted from, a given theory, we should consider revising or replacing it.

psychology the science that studies behavior and mental processes

theory a set of hypothesized statements about the relationships among events

The remainder of this chapter presents an overview of psychology as a science. You will see that psychologists have diverse interests and fields of specialization. We discuss the history of psychology and the major perspectives from which today's psychologists view behavior. Finally, we consider the research methods psychologists use to study behavior and mental processes.

1-1a WHAT PSYCHOLOGISTS DO

Psychologists share a keen interest in behavior, but they may differ markedly in other ways. Psychologists engage in research, practice, and teaching. Some researchers engage primarily in basic, or pure, research. **Pure research** is undertaken because the researcher is interested in the research topic. Pure research has no *immediate* application to personal or social problems and has therefore been characterized as research for its own sake. However, although pure research is sparked by curiosity and the desire to know and understand, today's pure research frequently enhances tomorrow's way of life. For example, pure research on learning and motivation in pigeons, rats, and monkeys done early in the 20th century has found applications in today's school systems. It has shown, for example, that learning often takes time and repetition and also profits from "booster shots" (repetition after the learning goal has been reached). Pure research into the workings of the nervous system has enhanced knowledge of disorders such as epilepsy, Parkinson's disease, and Alzheimer's disease. Other psychologists engage in **applied research**, which is designed to find solutions to specific personal or social problems.

Many psychologists do not conduct research. Instead, they *practice* psychology by applying psychological knowledge to help individuals change their behavior so that they can meet their own goals more effectively. Still other psychologists primarily teach. They share psychological knowledge in classrooms, seminars, and workshops. Psychologists may also engage in all three: research, practice, and teaching.

1-1b FIELDS OF PSYCHOLOGY

Psychologists are found in a number of specialties. Although some psychologists wear more than one hat, most carry out their functions in the following fields.

Clinical psychologists help people with psychological disorders adjust to the demands of life. Clinical psychologists evaluate problems such as anxiety and depression through interviews and psychological tests. They help clients resolve problems and change

self-defeating behavior. For example, they may help clients face "threats," such as public speaking, by exposing them gradually to situations in which they make presentations to actual or virtual groups (see virtual therapy in Chapter 13). Clinical psychologists are the largest subgroup of psychologists (see Figure 1.1 on page 6). *Counseling psychologists*, like clinical psychologists, use interviews and tests to define their clients' problems. Their clients typically have adjustment problems but not serious psychological disorders. For example, clients may have trouble making academic or vocational decisions; LGBT clients may have difficulty coping with prejudice and discrimination.

School psychologists are employed by school systems to identify and assist students who have problems that interfere with learning. They help schools make decisions about the placement of students in special classes. *Educational psychologists*, like school psychologists, attempt to facilitate learning, but they usually focus on course planning and instructional methods for a school system rather than on individual children. Educational psychologists research issues such as how learning is affected by psychological factors such as motivation and intelligence, sociocultural factors such as poverty and acculturation, and teachers.

Developmental psychologists study the changes—physical, cognitive, social, and emotional—that occur throughout the life span. They attempt to sort out the influences of heredity and the environment on development.

Personality psychologists identify and measure human traits and determine influences on human thought processes, feelings, and behavior. They are particularly concerned with issues such as anxiety, aggression, sexual orientation, and gender roles.

Social psychologists are concerned with the nature and causes of individuals' thoughts, feelings, and behavior in social situations. Whereas personality psychologists tend to look within the person to explain behavior, social psychologists tend to focus on social influences.

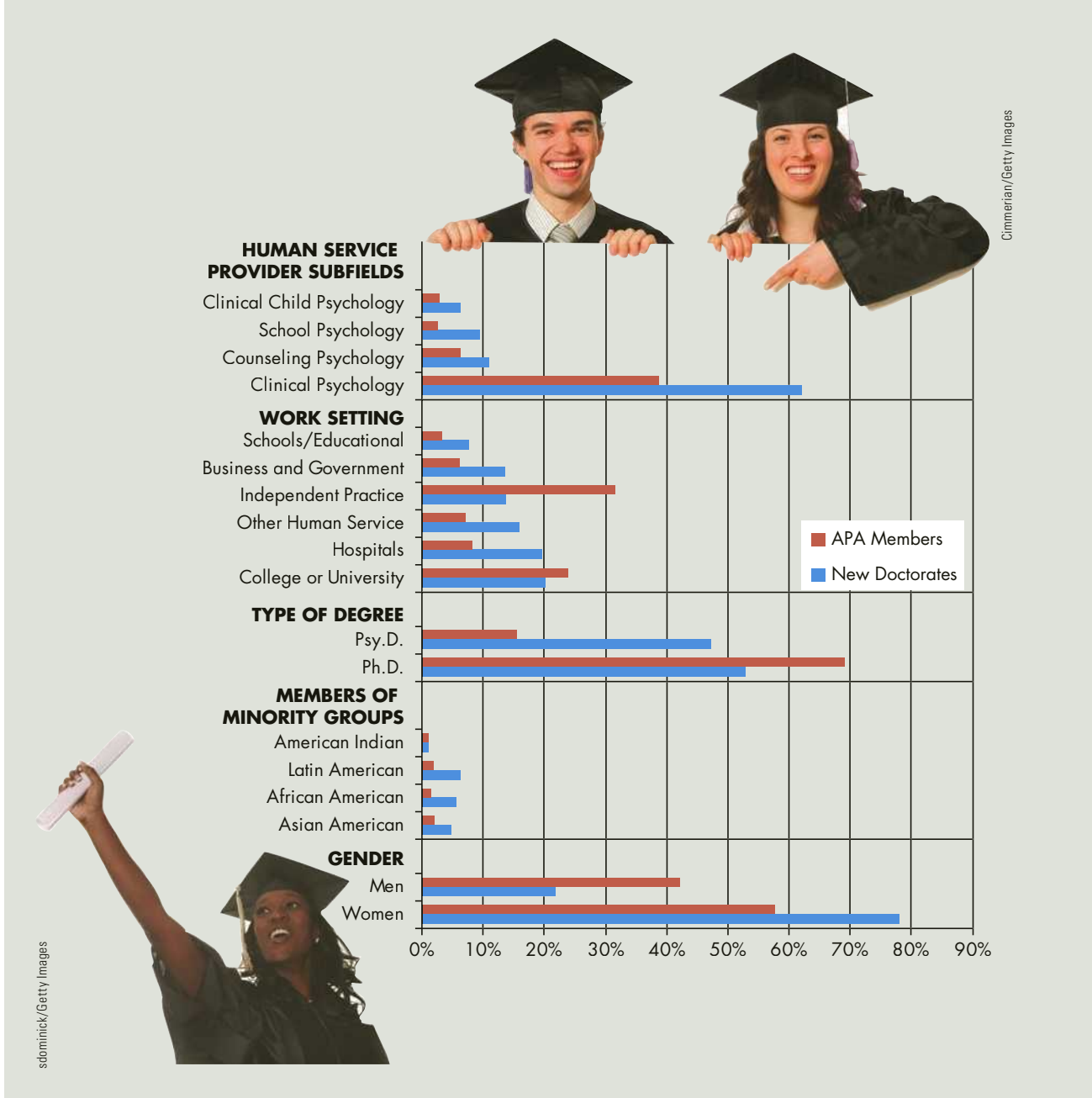
Environmental psychologists study the ways that people and the environment—the natural environment and the human-made environment—influence one another. For example, we know that extremes of temperature and loud noises interfere with learning in school. Environmental psychologists study ways to encourage people to recycle and to preserve bastions of wilderness.

pure research research conducted without concern for immediate applications

applied research research conducted in an effort to find solutions to particular problems

FIG.1.1

THE PSYCHOLOGISTS: PSYCHOLOGISTS WITH NEW DOCTORATES VERSUS MEMBERS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION (APA)



More women and members of ethnic minorities are entering the field of psychology today. The percentage of new psychologists with Psy.D. degrees is also growing.

Source: Adapted from the American Psychological Association (2009). *Doctoral Psychology Workforce Fast Facts*. Health Service Provider Subfields. Center for Workforce Studies. <http://research.apa.org/fastfacts-09.pdf>.
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Psychologists in all specialties may conduct experiments. However, those called *experimental psychologists* specialize in basic processes such as the nervous system, sensation and perception, learning and memory, thought, motivation, and emotion.

For example, experimental psychologists have studied what areas of the brain are involved in processing math problems or listening to music. They use people or animals, such as pigeons and rats, to study learning.



The Origins of Aggression?

Why are TV crime shows so popular? Why are people fascinated by psychopaths? Why do so many boys and men enjoy playing video games such as *Grand Theft Auto*, *God of War*, *Call of Duty*, and *Battlefield*? Psychologists investigate the origins of aggression and violence. They have found that aggressive people and mass murderers are more likely to play violent video games. Does this mean that violent video games cause violent behavior? Could it also mean that violent individuals are more likely to seek out the games? Could both be true? (More on this in Chapter 5.)

Industrial psychologists focus on the relationships between people and work. *Organizational psychologists* study the behavior of people in organizations such as businesses. *Human factors psychologists* make technical systems such as automobile dashboards and computer keyboards more user-friendly. *Consumer psychologists* study the behavior of shoppers in an effort to predict and influence their behavior. They advise store managers on how to lay out the aisles of a supermarket in ways that boost impulse buying, how to arrange window displays to attract customers, and how to make newspaper ads and television commercials more persuasive.

Health psychologists study the effects of stress on health problems such as headaches, cardiovascular disease, and cancer. Health psychologists also guide clients toward healthier behavior patterns, such as exercising and quitting smoking.

FICTION

T **F** Men receive the majority of doctoral degrees in psychology.

It is not true that men receive the majority of doctoral degrees in psychology. Women do.

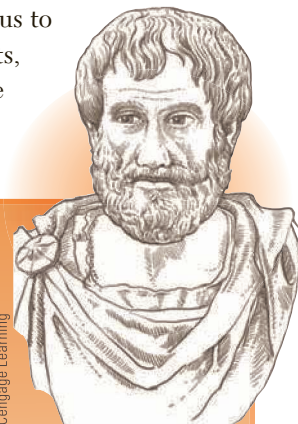
Forensic psychologists apply psychology to the criminal justice system. They deal with legal matters such as whether a defendant was sane when he or she committed a crime. Forensic psychologists may also treat psychologically ill offenders, consult with attorneys on matters such as picking a jury, and analyze offenders' behavior and mental processes. They may conduct research on matters ranging from evaluation of eyewitness testimony to methods of interrogation.

Sport psychologists help athletes concentrate on their performance and not on the crowd, use cognitive strategies such as positive visualization (imagining themselves making the right moves) to enhance performance, and avoid choking under pressure.

1-2 HISTORICAL FOUNDATIONS OF PSYCHOLOGY

Have you heard the expression “Know thyself”? It was proposed by the ancient Greek philosopher Socrates about 2,500 years ago. Psychology, which is in large part the endeavor to know ourselves, is as old as history and as modern as today. Knowledge of

the history of psychology allows us to appreciate its theoretical conflicts, its place among the sciences, the evolution of its methods, and its social and political roles.



ARISTOTLE

Although he lived 2,400 years ago, the Greek philosopher Aristotle made many contributions to contemporary psychology:

- ▶ He argued that science could rationally treat only information gathered by the senses.
- ▶ He enumerated the so-called five senses of vision, hearing, smell, taste, and touch.
- ▶ He explored the nature of cause and effect.
- ▶ He pointed out that people differ from other living things in their capacity for rational thought.
- ▶ He outlined laws of associationism that have lain at the heart of learning theory for more than two millennia.
- ▶ He also declared that people are more motivated to seek pleasure and avoid pain—a view that remains as current today as it was in ancient Greece.

Another ancient contributor to psychology was the Greek philosopher Aristotle (384–322 BCE). Aristotle argued that human behavior, like the movements of the stars and the seas, is subject to rules and laws. Then he delved into his subject matter topic by topic: personality, sensation and perception, thought, intelligence, needs and motives, feelings and emotion, and memory.

TRUTH

T F More than 2,000 years ago, Aristotle wrote a book on psychology with contents similar to those of the one you're now reading.

It is true that Aristotle wrote a book on psychology with contents similar to the one you're now reading more than 2,000 years ago. In fact, the outline for PSYCH could have been written by Aristotle.

Other ancient Greek philosophers also contributed to psychology. Around 400 BCE, Democritus suggested that we could think of behavior in terms of a body and a mind. (Contemporary psychologists still talk about the interaction of biological and mental processes.) He pointed out that our behavior is influenced by external stimulation. Democritus was one of the first to raise the question of whether there is free will or choice. Putting it another way, where do the influences of others end and our “real selves” begin?

Socrates suggested that we should rely on rational thought and **introspection**—careful examination of one's own thoughts and emotions—to gain self-knowledge. He also pointed out that people are social creatures who influence one another.

Had we room enough and time, we could trace psychology's roots to thinkers farther back in time than the ancient Greeks, and we could trace its development through the great thinkers of the Renaissance. As it is,

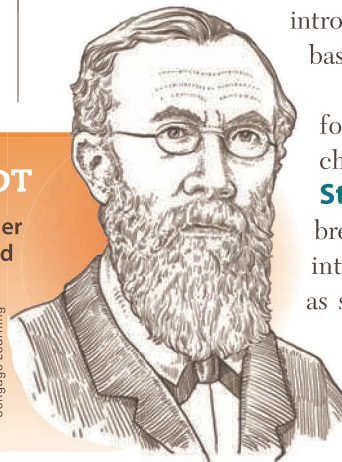
introspection deliberate looking into one's own cognitive processes to examine one's thoughts and emotions

structuralism the school of psychology that argues that the mind consists of three basic elements—sensations, feelings, and images—that combine to form experience

WILHELM WUNDT

Wilhelm Wundt, the founder of structuralism, attempted to break down conscious experience into sensations such as sight and taste, emotions, and mental imagery.

Cengage Learning



TRUTH

T F The ancient Greek philosopher Socrates suggested a research method that is still used in psychology.

Yes, Socrates did suggest a research method that is still used in psychology—introspection. The method is based on Socrates' advice to “Know thyself,” which has remained a motto of psychology ever since.

we must move on to the development of psychology as a laboratory science during the second half of the 19th century. Some historians set the marker date at 1860. It was then that Gustav Theodor Fechner (1801–1887) published his landmark book *Elements of Psychophysics*, which showed how physical events (such as lights and sounds) are related to psychological sensation and perception. Fechner also showed how we can scientifically measure the effect of these events. Most historians set the debut of modern psychology as a laboratory science in the year 1879, when Wilhelm Wundt established the first psychological laboratory in Leipzig, Germany.

1-2a STRUCTURALISM

The German psychologist Wilhelm Wundt (1832–1920) looked as if he were going to be a problem child. He did poorly in elementary school—his mind would wander—and he had to repeat a grade. Eventually he attended medical school because he wanted to earn a good living. But he did not like working with patients and dedicated himself to philosophy and psychology.

Like Aristotle, Wundt saw the mind as a natural event that could be studied scientifically, like light, heat, and the flow of blood. Wundt used introspection to try to discover the basic elements of experience.

Wundt and his students founded the school of psychology called *structuralism*. **Structuralism** attempted to break conscious experience down into *objective* sensations, such as sight or taste, and *subjective* feelings, such as emotional responses, and mental images such as memories or dreams. Structuralists

believed that the mind functions by combining objective and subjective elements of experience.

1-2b FUNCTIONALISM

Toward the end of the 19th century, psychologist William James (1842–1910) became a major figure in the development of psychology in the United States. He focused on the relation between conscious experience and behavior. He argued, for example, that the stream of consciousness is fluid and continuous. Introspection convinced him that experience cannot be broken down into objective sensations and subjective feelings as the structuralists maintained.

William James was a founder of the school of **functionalism**, which focused on behavior as well as the mind or consciousness. Functionalists looked at how our experience helps us function more adaptively in our environments—for example, how habits help us cope with common situations. (When eating with a spoon, we do not create an individual plan to bring each morsel of food to our mouths.) They also turned to the laboratory for direct observations as a way to supplement introspection. Structuralists tended to ask, “What are the pieces that make up thinking and experience?” In contrast, functionalists tended to ask, “How do behavior and mental processes help people adapt to the requirements of their lives?”

James was also influenced by Charles Darwin’s (1809–1882) theory of evolution. Earlier in the 19th century, the British naturalist Darwin had argued that organisms with adaptive features—that is, the “fittest”—survive and reproduce. Functionalists adapted Darwin’s theory and proposed that adaptive behavior patterns are learned and maintained. Maladaptive behavior patterns tend to drop out, and only the fittest behavior patterns survive. These adaptive actions tend to be repeated and become habits. James wrote that “habit is the enormous flywheel of society.” Habit keeps the engine of civilization running.

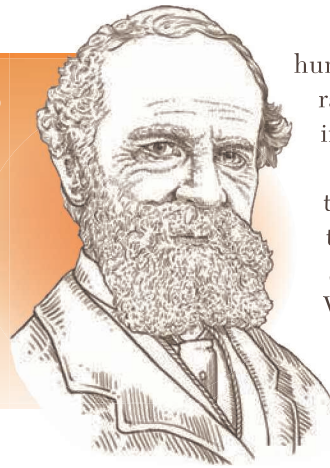
1-2c BEHAVIORISM

Imagine you have placed a hungry rat in a maze. It meanders down a pathway that ends in a T. It can then turn left or right. If you consistently reward the rat with food for turning right at this point, it will learn to turn right when it arrives there, at least when it is

WILLIAM JAMES

William James wrote the first modern psychology textbook in 1890. He wrote, “I wished, by treating Psychology like a natural science, to help her become one.”

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hungry. But what does the rat *think* when it is learning to turn right?

Does it seem absurd to try to place yourself in the “mind” of a rat? So it seemed to John Broadus Watson (1878–1958), the founder of American behaviorism. Watson was asked to consider the contents of a rat’s “mind” as

one of the requirements for his doctoral degree, which he received from the University of Chicago in 1903. Functionalism was the dominant view of psychology at the University of Chicago, and functionalists were concerned with the stream of consciousness as well as observable behavior. But Watson (1913) believed that if psychology was to be a natural science, like physics or chemistry, it must limit itself to observable, measurable events—that is, to behavior alone—hence the term *behaviorism*.

Behaviorism is the school of psychology that focuses on learning observable behavior. The term *observable* refers to behaviors that are observable by means of specialized instruments, such as heart rate, blood pressure, and brain waves. These behaviors are *public*—they can be measured easily and different observers would agree about their existence and features. Given their focus on behavior, behaviorists define psychology as the scientific study of *behavior*, not of *behavior* and *mental processes*.

B. F. Skinner (1904–1990) also contributed to behaviorism. He believed that organisms learn to behave in certain ways because they have been **reinforced** for doing so—that is, their behavior has a positive outcome. He demonstrated that laboratory animals can be trained to carry out behaviors through strategic use of reinforcers, such as food. He trained rats to turn in circles, climb ladders, and push toys across the floor. Because Skinner demonstrated that remarkable combinations of behaviors could be taught by means of reinforcement, many psychologists adopted the view that, in principle, one could

functionalism the school of psychology that emphasizes the uses or functions of the mind rather than the elements of experience

behaviorism the school of psychology that defines psychology as the study of observable behavior and studies relationships between stimuli and responses

reinforcement a stimulus that follows a response and increases the frequency of the response

FIG.1.2 THE POWER OF REINFORCEMENT



Behaviorists have shown that we can teach animals (and people) complex behaviors by first reinforcing approximations to the goal or target behavior. For example, we might first drop a food pellet into our feathered friend's cage when she drops the star anywhere on the tray, and then demand closer tries before reinforcing her. With people, of course, we can reinforce desired behavior by saying things like "Good" and "That's right," or "You're getting there."

explain complex human behavior in terms of thousands of instances of learning through reinforcement (see Figure 1.2).

1-2d GESTALT PSYCHOLOGY

In the 1920s, another school of psychology—**Gestalt psychology**—was prominent in Germany. In the 1930s, the three founders of the school—Max Wertheimer (1880–1943), Kurt Koffka (1886–1941), and Wolfgang Köhler (1887–1967)—left Europe to escape the Nazi threat. They carried on their work in the United States, giving further impetus to the growing American ascendance in psychology.

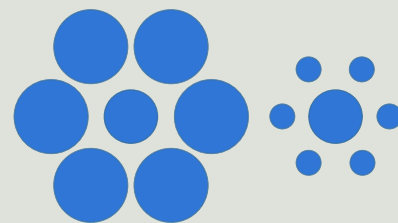
Gestalt psychologists focused on perception and how perception influences thinking and problem solving. The German word *Gestalt* translates roughly to "pattern" or "organized whole." In contrast to behavior-

ists, Gestalt psychologists argued that we cannot hope to understand human nature by focusing only on overt behavior. In contrast

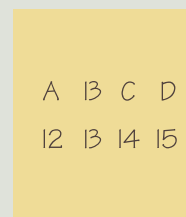
to structuralists, they claimed that we cannot explain human perceptions, emotions, or thought processes in terms of basic units. Perceptions are *more* than the sums of their parts: Gestalt psychologists saw our perceptions as wholes that give meaning to parts, as we see in Figure 1.3.

Gestalt psychologists showed that we tend to perceive separate pieces of information as integrated wholes depending on the contexts in which they occur. In Figure 1.3A, the dots in the centers of the configurations are the same size, yet we may perceive them as being different in size because of their surroundings. The second symbol in each line in part B is identical,

FIG.1.3 GESTALT PSYCHOLOGY AND THE IMPORTANCE OF CONTEXT



A. Are the dots in the center of the configurations the same size? Why not take a ruler and measure them?



B. Is the second symbol in each line the letter *B* or the number *13*?



C. Which of the gray squares is brighter?

Gestalt psychologists have shown that we tend to interpret objects and people according to their context. You interpret somebody's running toward you differently when you are in a dark alley or watching a football game. Interpret the examples shown above.

gestalt psychology the school of psychology that emphasizes the tendency to organize perceptions into wholes and to integrate separate stimuli into meaningful patterns

but in the top row we may perceive it as a B and in the bottom row as the number 13. The symbol has not changed, but its context has. The inner squares in part C are equally bright, but they do not appear so because of their contrasting backgrounds.

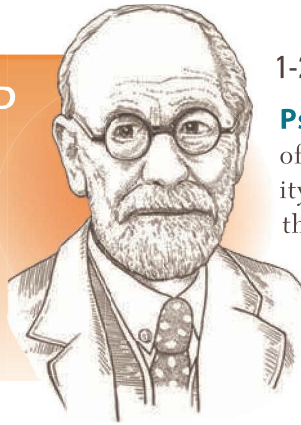
Gestalt psychologists believed that learning could be active and purposeful, not merely responsive and mechanical as in Watson's and Skinner's experiments. They demonstrated that much learning, especially in problem solving, is accomplished by insight, not by mechanical repetition.

Consider Köhler's classic research with chimpanzees, as shown in Figure 1.4. At first, the chimp is unsuccessful in reaching bananas suspended from the ceiling. Then it suddenly stacks the boxes and climbs up to reach the bananas. It seems the chimp has experienced a sudden reorganization of the mental elements of the problem—that is, he has had a “flash of insight.” Köhler's findings suggest that we often manipulate the elements of problems until we group them in such a way that we can reach a goal. The manipulations may take quite some time as mental trial and error proceeds. But once the proper grouping has been found, we seem to perceive it all of a sudden.

SIGMUND FREUD

Sigmund Freud, the founder of psychoanalysis, is the often the first person that comes to mind when people are asked to name a psychologist.

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1-2e PSYCHOANALYSIS

Psychoanalysis is the name of both the theory of personality and the method of psychotherapy developed by Sigmund Freud (1856–1939). As a theory of personality, psychoanalysis proposes that much of our lives is governed by unconscious ideas and impulses that originate in childhood conflicts. As a method of psychotherapy, psychoanalysis aims to help patients gain insight into their conflicts and to find socially acceptable ways of expressing wishes and gratifying needs. We'll discuss psychoanalysis in more depth in Chapter 10.

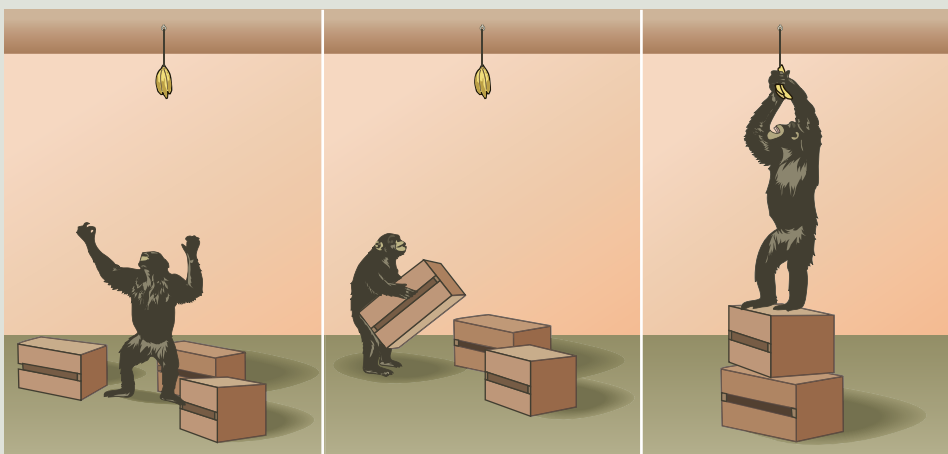
1-3 CONTEMPORARY PERSPECTIVES IN PSYCHOLOGY

Today, we no longer find psychologists who describe themselves as structuralists or functionalists. Although the school of Gestalt psychology gave birth to current research approaches in perception and problem solving, few would label themselves Gestalt psychologists. But we do find Gestalt *therapists* who focus on helping clients integrate conflicting parts of their personal-

ity (making themselves “whole”). The numbers of orthodox behaviorists and psychoanalysts have been declining (Robins et al., 1999). Many contemporary psychologists in the behaviorist tradition look on themselves as social-cognitive theorists, who see much of human learning as intentional rather than mechanical.

psychoanalysis the school of psychology that emphasizes the importance of unconscious motives and conflicts as determinants of human behavior

FIG.1.4 GESTALT PSYCHOLOGY: SOME INSIGHT INTO INSIGHT



Have you ever had an “Aha” experience? The chimpanzee from Köhler's research is shown here having just such an experience. At first, it cannot reach the bananas hanging from the ceiling. After some time has passed, it has an apparent “flash of insight” and rapidly piles the boxes on top of one another to reach the fruit.

The history of psychological thought has taken many turns, and contemporary psychologists differ in their approaches. Today, there are several broad, influential perspectives in psychology: biological, cognitive, humanistic–existential, psychodynamic, learning, and sociocultural. Each approaches its topics in its own way.

1-3a THE BIOLOGICAL PERSPECTIVE

Psychologists with a **biological perspective** seek the relationships between the brain, hormones, heredity, and evolution, on the one hand, and behavior and mental processes on the other. Psychologists assume that thoughts, fantasies, and dreams—and the inborn or instinctive behavior patterns of various species—are made possible by the nervous system and especially by the brain.

Biologically oriented psychologists also study the role of heredity in behavior and mental processes such as psychological disorders, criminal behavior, and thinking. Generally speaking, our heredity provides a broad range of behavioral and mental possibilities. Environmental factors interact with inherited factors to determine specific behavior and mental processes.

Biologically oriented psychologists focus on the evolution of behavior and mental processes as well. Charles Darwin argued that in the age-old struggle for existence, only the fittest (most adaptive) organisms manage to reach maturity and reproduce. For example, fish that swim faster or people who are naturally immune to certain diseases are more likely to survive and transmit their genes to future generations. Therefore, species tend to evolve in adaptive directions. Evolutionary psychologists suggest that much human

social behavior, such as aggressive behavior and mate selection, has a hereditary basis. People may be influenced by social rules, cultural factors, and personal choice, but evolutionary psychologists believe that inherited tendencies sort of whisper in people's ears and tend to move them in certain directions.

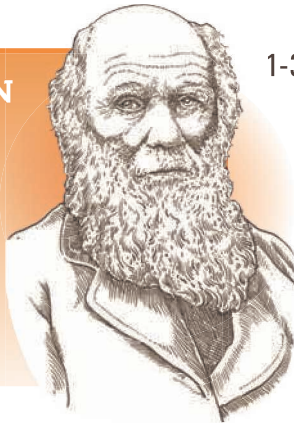
biological perspective the approach to psychology that seeks to understand the nature of the links between biological processes and structures such as the functioning of the brain, the endocrine system, and heredity, on the one hand, and behavior and mental processes, on the other

cognitive having to do with mental processes such as sensation and perception, memory, intelligence, language, thought, and problem solving

CHARLES DARWIN

In the mid-19th century, the British naturalist Charles Darwin presented his theory that the animal and plant species that occupy the world today—including *homo sapiens* (us)—have evolved from earlier species.

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1-3b THE COGNITIVE PERSPECTIVE

Psychologists with a **cognitive** perspective venture into the realm of mental processes to understand human nature. They investigate the ways we perceive and mentally represent the world,

how we learn, remember the past, plan for the future, solve problems, form judgments, make decisions, and use language. Cognitive psychologists, in short, study those things we refer to as the *mind*.

The cognitive tradition has roots in Socrates' advice to "Know thyself" and in his suggested method of introspection. We also find cognitive psychology's roots in structuralism, functionalism, and Gestalt psychology, each of which, in its own way, addresses issues that are of interest to cognitive psychologists.

1-3c THE HUMANISTIC–EXISTENTIAL PERSPECTIVE

The humanistic–existential perspective is cognitive in flavor, yet it emphasizes the role of subjective (personal) experience. Let's consider each of the parts of this perspective: humanism and existentialism.

Humanism stresses the human capacity for self-fulfillment and the central roles of consciousness, self-awareness, and decision making. Humanists believe that self-awareness, experience, and choice permit us, to a large extent, to "invent ourselves" and our ways of relating to the world as we progress through life. Consciousness—our sense of being in the world—is seen as the force that unifies our personalities. *Existentialism* views people as free to choose and as being responsible for choosing ethical conduct. Grounded in the work of Carl Rogers (1951) and Abraham Maslow (1970), the humanistic–existential perspective has many contemporary adherents.

1-3d THE PSYCHODYNAMIC PERSPECTIVE

In the 1940s and 1950s, psychodynamic theory dominated the practice of psychotherapy and was influential in scientific psychology and the arts. Most psychotherapists were psychodynamically oriented. Many renowned artists and writers consulted psychodynamic therapists as a way to liberate the expression of their unconscious ideas. Today, Freud's influence continues to be felt,

although it no longer dominates psychotherapy. Contemporary psychologists who follow theories derived from Freud are likely to call themselves *neoanalysts*. Famous neoanalysts such as Karen Horney (1885–1952) and Erik Erikson (1902–1994) focused less on unconscious processes and more on conscious choice and self-direction.

1-3e PERSPECTIVES ON LEARNING

Many contemporary psychologists study the effects of experience on behavior. Learning, to them, is the essential factor in describing, explaining, predicting, and controlling behavior. The term *learning* has different meanings to psychologists of different persuasions, however. Some students of learning find roles for consciousness and insight. Others do not. This distinction is found today among those who adhere to the behavioral and social–cognitive perspectives.

Early proponents of behaviorism, such as John B. Watson, viewed people as doing things because of their learning histories, their situations, and rewards, not because of conscious choice. Like Watson, contemporary behaviorists emphasize environmental influences and the learning of habits through repetition and reinforcement. **Social cognitive theorists**, in contrast, suggest that people can modify and create their environments. They also grant *cognition* a key role. They note that people engage in intentional learning by observing others. Since the 1960s, social cognitive theorists have gained influence in the areas of personality development, psychological disorders, and psychotherapy.

1-3f THE SOCIOCULTURAL PERSPECTIVE

The profession of psychology focuses mainly on the individual and is committed to the dignity of the individual. However, many psychologists believe we cannot understand people’s behavior and mental processes without reference to their diversity (Miville et al., 2016).

The **sociocultural perspective** addresses many of the ways that people differ from one another. It studies the influences of ethnicity, gender, culture, and socioeconomic status on behavior and mental processes (Comas-Diaz & Greene, 2013). For example, what is often seen as healthful, self-assertive, outspoken behavior by most U.S. women may be interpreted as brazen behavior in Latin American or Asian American communities.



David Burffington/PhotoDisc/Getty Images

Psychologists focus on the individual but believe that we cannot understand individuals without referring to their diversity, such as their gender, their ethnic backgrounds, and their physical condition.

ETHNICITY One kind of diversity involves ethnicity. Members of an *ethnic group* share their cultural heritage, race, language, or history. The experiences of various ethnic groups in the United States highlight the impact of social, political, and economic factors on human behavior and development (Miville et al., 2016).

In the 1940s, Kenneth Bancroft Clark (1914–2005) and Mamie Phipps Clark (1917–1983) conducted research that showed the negative effects of school segregation on African American children. In one such study, African American children were shown white and brown dolls and asked to “Give me the pretty doll,” or “Give me the doll that looks bad.”

social cognitive theory
a school of psychology in the behaviorist tradition that includes cognitive factors in the explanation and prediction of behavior; formerly termed *social learning theory*

sociocultural perspective
the view that focuses on the roles of ethnicity, gender, culture, and socioeconomic status in behavior and mental processes

Most children's choices showed that they preferred the white dolls more than the brown ones. The Clarks concluded that the children had swallowed the larger society's prejudiced views that favored European Americans. The Clark's research was cited by the Supreme Court in 1954 when it overturned the "separate but equal" schools doctrine that had allowed inequalities in school services for various ethnic groups.

Latin American and Asian American psychologists have also made their mark. Jorge Sanchez was among the first to show how intelligence tests are culturally biased—to the disadvantage of Mexican American children. Latina American psychologist Lillian Comas-Diaz (2013) has edited a journal on multicultural mental health. Asian American psychologist Richard M. Suinn (2001) studies mental health and the development of identity among Asians and Asian Americans.

Figure 1.1 shows that the percentage of psychologists from ethnic minorities is higher among psychologists with new doctorates than among APA members who include psychologists from older generations. Psychologists are becoming more diverse.

GENDER Gender refers to the culturally defined concepts of *masculinity* and *femininity*. Gender is not fully defined by anatomic sex. It involves a complex web of cultural expectations and social roles that affect people's self-concepts and hopes and dreams as well as their behavior. Just as members of ethnic minority groups have experienced prejudice, so too have women.

Although American women have attended college only since 1833, when Oberlin College opened its doors to women, most American college students today are in fact women. Women APA members outnumber APA members (refer back to Figure 1.1), and their numbers are growing dramatically, as shown by

the percentage of new doctorates received by women (American Psychological Association, 2009, 2012).

Women have made indispensable contributions to psychology. Mary Whiton Calkins (1863–1930) introduced the method of paired associates to study memory (see Chapter 7), discovered the primacy and recency effects, and engaged in research into the role of the frequency of repetition in the vividness of memories. Calkins had studied psychology at Harvard University, which she had to attend as a "guest student," because Harvard was not yet admitting women. When she completed her Ph.D. requirements, Harvard would not award her the degree because of her sex. Instead, Harvard offered to grant her a doctorate from its sister school, Radcliffe. As a form of protest, Calkins declined the offer. Even without the Ph.D., Calkins went on to become president of the American Psychological Association.

In more recent years, Mary Salter Ainsworth (1913–1999) revolutionized our understanding of attachment between parents and children by means of her cross-cultural studies. Loftus, E. (2015) has shown that our memories are not snapshots of the past. Instead, they often consist of something old (what actually happened), something new (i.e., influenced by more recent events), something borrowed (e.g., further shaped by our biases and prejudices), and something blue (altered by tinges of color or emotion).

The contributions of members of diverse ethnic groups and women have broadened our understanding of the influences of ethnicity and gender on behavior and mental processes. They have also increased our knowledge of differences among Europeans. For example, Southern European singles (from Italy, Greece, and Portugal) are more likely than Northern



How did "the Doll Experiment" by Kenneth Bancroft Clark and Mamie Phipps Clark influence a Supreme Court decision?

Eudora Welty/Historical Premium/Corbis

gender the culturally defined concepts of *masculinity* and *femininity*

MARY WHITON CALKINS

At a time when men dominated the discipline of psychology, Mary Whiton Calkins was one of the pioneers who fought the male-centered bias and encouraged psychology to incorporate the values of the “new woman” (Rogers, 2009). She pioneered research in memory at Wellesley College, where she founded a psychology laboratory in 1891. She introduced the method of paired associates, discovered the primacy and recency effects, and engaged in research into the role of the frequency of repetition in the vividness of memories.



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European singles (from the United Kingdom, France, Germany, and Scandinavia) to live with their parents until they get married (Giuliano, 2007). The researcher suggests that the family ties of Southern Europeans seem to be relatively stronger.

TRUTH

T F Even though she had worked to complete all the degree requirements, the first female president of the American Psychological Association turned down the doctoral degree that was offered to her.

It is true that the first female president of the American Psychological Association, Mary Whiton Calkins, turned down the doctoral degree that was offered to her by Radcliffe. Radcliffe was Harvard University’s “sister school,” and she rejected the sexism that was preventing her from receiving the degree that she had actually earned at Harvard.

1-4 HOW PSYCHOLOGISTS STUDY BEHAVIOR AND MENTAL PROCESSES

Does alcohol cause aggression? Does watching violence on television cause children to be violent? Why do some people hardly ever think of food, whereas others are obsessed with it and snack all day? Why do some unhappy people attempt suicide, whereas others

don’t? How does having people of different ethnic backgrounds collaborating in their work affect feelings of prejudice?

Many of us have expressed opinions—maybe strong opinions—on questions like these. But as we saw in our discussion of people who claim to be abducted by aliens from outer space, scientists insist on evidence. Psychologists, like other scientists, use careful means to observe and measure behavior and the factors that influence behavior.

Psychologists use the scientific method to decide what kind of evidence they need and how to pursue it. They also select the population they intend to study, such as U.S. teenagers or older adults, and try to obtain a representative sample of that population.

1-4a THE SCIENTIFIC METHOD

The **scientific method** is an organized way of using experience and testing ideas to expand and refine knowledge. Psychologists do not necessarily follow the steps of the scientific method as we might follow a recipe in a cookbook, but research is guided by certain principles.

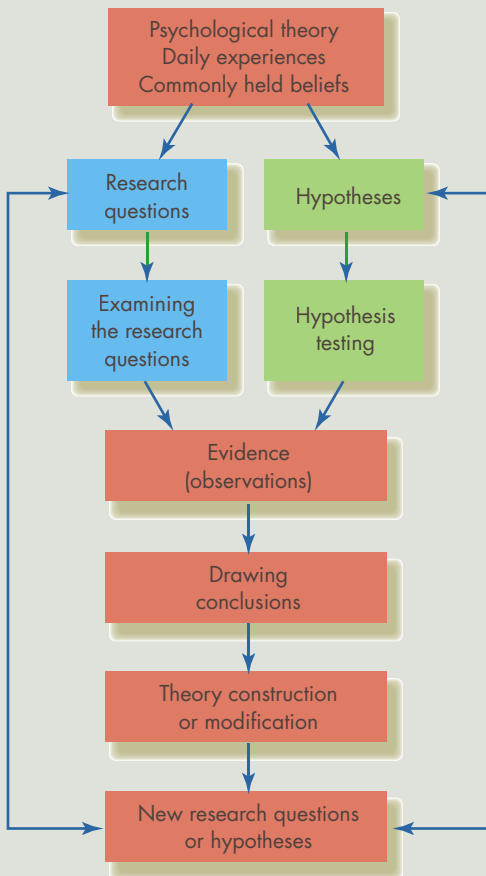
Psychologists usually begin by *formulating a research question*. Research questions can have many sources. Our daily experiences, psychological theory, and even folklore all help generate questions for research. Daily experience in using day-care centers may motivate us to conduct research on whether day care affects the development of social skills or the bonds of attachment between children and their parents. Social cognitive principles of observational learning may prompt research on the effects of television violence. Research questions may also arise from common knowledge. Consider familiar adages such as “misery loves company” and “opposites attract.” Psychologists may ask: *Does misery love company? Do opposites attract?*

A research question may be studied as a question or reworded as a *hypothesis* (see Figure 1.5). A **hypothesis** is a statement about behavior or mental processes that is testable through research. A hypothesis about day care might be that preschoolers who are placed in day care will acquire greater social skills in relating to peers than preschoolers who are cared for in the home.

scientific method an organized way of using experience and testing ideas to expand and refine knowledge

hypothesis in psychology, a specific statement about behavior or mental processes that is tested through research

FIG.1.5 THE SCIENTIFIC METHOD



The scientific method is a systematic way of organizing and expanding scientific knowledge.

Psychologists next examine the research question or *test the hypothesis* through controlled methods such as the experiment. For example, we could take a group of preschoolers who attend day care and another group who do not and introduce each to a new child in a controlled setting such as a child-research center. We could then observe how children in each group interact with the new acquaintance.

correlation an association or relationship among variables, as we might find between height and weight, or between study habits and school grades

selection factor a source of bias that may occur in research findings when participants are allowed to choose for themselves a certain treatment in a scientific study

Psychologists draw conclusions about their research questions or the accuracy of their hypotheses on the basis of their observations or findings. When their observations do not bear out their hypotheses, they may modify the theories from which the

hypotheses were derived. Research findings often suggest refinements to psychological theories and new avenues of research. In our research on day care, we might find that children in day care show greater social skills than children who are cared for in the home (Belsky et al., 2001).

As psychologists draw conclusions from research evidence, they are guided by principles of critical thinking. For example, they try not to confuse **correlations**—or associations—between findings with cause and effect. Although more aggressive children apparently spend more time watching violent television shows, it may be erroneous to conclude from this kind of evidence that television violence *causes* aggressive behavior. A **selection factor** may be at work because the children being studied choose (select) for themselves what they will watch. Perhaps more aggressive children are more likely than less aggressive children to tune in to violent television shows.

1-4b SAMPLES AND POPULATIONS

Consider a piece of history that never quite happened: The Republican candidate Alf Landon defeated the incumbent president, Franklin D. Roosevelt, in 1936. Or at least Landon did so in a poll conducted by a popular magazine of the day, the *Literary Digest*. In the actual election, however, Roosevelt routed Landon by a landslide. In effect, the *Literary Digest* accomplished something like this when they predicted a Landon victory. How was so great a discrepancy possible?

The *Literary Digest*, you see, had surveyed voters by phone. Today, telephone sampling is still widely practiced, but the *Literary Digest* poll was taken during the Great Depression, when people who had telephones were much wealthier than those who did not. People at higher income levels are also more likely to vote

TRUTH

T **F** You could survey millions of voters and still not accurately predict the outcome of a presidential election.

It is true that you could survey millions of voters and still not predict the outcome of a presidential election. Samples must be representative; size alone may not matter.



The Importance of Sample Selection

You may ask 20,000 people like this who they will vote for in the U.S. presidential election, but it will probably not help you determine the winner. Wealthy people tend to vote Republican, and in order to make your prediction, you need to sample people who represent the target population—that is, Americans of various income levels who are likely to vote.

Republican, in this case, for Landon. Question: Is telephone sampling valid if it omits people—like many college students!—whose only telephone is a cellphone?

The *Literary Digest* poll failed because of its method of sampling. A **sample** is a segment of a **population** that must be drawn so that it accurately *represents* that population. Only representative samples allow us to *generalize*—or *extend*—our findings from research samples to target populations, such as U.S. voters, and not subgroups such as southern Californians or European American members of the middle class.

1-4c PROBLEMS IN GENERALIZING FROM PSYCHOLOGICAL RESEARCH

Many factors must be considered when interpreting the accuracy of the results of scientific research. One is the nature of the research sample. Later in the chapter, we consider research in which the participants were drawn from a population of college men who were social drinkers. That is, they tended to drink at social gatherings but not when alone. Who do college men represent other than themselves? To whom can we extend, or generalize, the results? For one thing, they

“All generalizations are dangerous, even this one.”

Alexandre Dumas

do not extend to college women, who, as we see in Chapter 4, are affected more quickly than men are by alcohol.

Also, compared to the general adult male population, college men are younger and score higher on intelligence tests. Social drinkers may also differ biologically and psychologically from alcoholics, who have difficulty controlling their drinking.

By and large, we must also question whether findings of research with men can be generalized to women, and whether research with European American men can be extended to members of ethnic minority groups.

RANDOM AND STRATIFIED SAMPLING One way to achieve a representative sample is by means of random sampling. In a **random sample**, each member of a population has an equal chance of being selected to participate. Researchers can also use a **stratified sample**, which is selected so that identified subgroups in the population are represented proportionately in the sample. For instance, 13% of the American population is African American. A stratified sample would thus be 13% African American. As a practical matter, a large randomly selected sample will show reasonably accurate stratification. A random sample of 1,500 people will represent the broad American population reasonably well. However, a sample of 20,000 European Americans or men will not.

Large-scale magazine surveys of sexual behavior ask readers to fill out and return questionnaires. Although many thousands of readers complete the questionnaires and send them in, do the survey respondents represent the American population? Probably not. These and similar studies may be influenced by **volunteer bias**. People who offer or volunteer to participate in research studies differ systematically from

sample part of a population

population a complete group of interest to researchers, from which a sample is drawn

random sample a sample drawn so that each member of a population has an equal chance of being selected to participate

stratified sample a sample drawn so that identified subgroups in the population are represented proportionately in the sample

volunteer bias a source of bias or error in research reflecting the prospect that people who offer to participate in research studies differ systematically from people who do not

people who do not. In the case of research on sexual behavior, volunteers may represent subgroups of the population—or of readers of the magazines in question—who are willing to disclose intimate information and therefore may also be likely to be more liberal in their sexual behavior (Rathus et al., 2017). Volunteers may also be more interested in research than other people, as well as have more spare time. How might such volunteers differ from the population at large? How might such differences slant or bias the research outcomes?

1-5 METHODS OF RESEARCH

Many people consider themselves experts on behavior and mental processes. How many times, for example, have you or someone else been eager to share a life experience that proves some point about human nature?

We see much during our lifetimes, but our personal observations tend to be fleeting and unsystematic. We sift through experience for the things that interest us. We often ignore the obvious because it does not fit our assumptions about the way things ought to be. Scientists, however, have devised more controlled ways of studying others.

1-5a METHODS OF OBSERVATION

Nearly all kinds of psychological research involve observation of the behavior of samples of populations. But some methods—the case study, the survey, and naturalistic observation—are mainly descriptive in nature.

THE CASE STUDY **Case studies** collect information about individuals and small groups. Many case studies are clinical; that is, they are descriptions of a person's psychological problems and how a psychologist treated

case study a carefully drawn biography that may be obtained through interviews, questionnaires, and psychological tests

them. Case studies are sometimes used to investigate rare occurrences, as in the case of Chris Sizemore, who was diagnosed with dissociative identity disorder (“multiple personalities”). A psychiatrist identified three distinct personalities in Chris. Her story was made into a movie called *The Three Faces of Eve* (a fictitious name). One personality, “Eve White,” was a mousy, well-meaning woman. “Eve Black,” a flirtatious and promiscuous personality sometimes emerged and took control of Eve. A third personality, “Jane,” was well-adjusted and integrated parts of the personalities of the Eves.

Case studies are subject to inaccuracies. We find gaps and factual errors in people's memories (Bernstein & Loftus, 2009). People may also distort their pasts to please or to antagonize the interviewer. Interviewers may also have certain expectations and may subtly encourage participants to fill in gaps in ways that are consistent with these expectations. Psychoanalysts, for example, have been criticized for guiding people who seek their help into viewing their own lives from the psychodynamic perspective (Hergenhahn & Henley, 2014). No wonder, then, that many people provide “evidence” that is consistent with psychodynamic theory—such as, “My parents' inept handling of my toilet training is the source of my compulsive neatness.” However, interviewers of *any* theoretical viewpoint may subtly prod people into saying what they want to hear.



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The Kinsey Studies.

In the film biography *Kinsey*, Liam Neeson played Alfred Kinsey, the scientist who investigated human sexuality during a time when even talking about sex was considered indecent.

THE SURVEY Just as computers and pollsters predict election results and report national opinion on the basis of scientifically selected samples, psychologists conduct **surveys** to learn about behavior and mental processes that cannot be observed in the natural setting or studied experimentally. Psychologists conducting surveys may employ questionnaires and interviews or examine public records. One of the advantages of the survey is that by distributing questionnaires and analyzing answers with a computer, psychologists can study many thousands of people at a time.

One of the best-known surveys, the so-called Kinsey reports, provided surprising information about people's sexual behavior during the middle of the 20th century, a time of widespread sexual repression in the United States. Alfred Kinsey and his colleagues published two surveys of sexual behavior, based on interviews: *Sexual Behavior in the Human Male* (1948) and *Sexual Behavior in the Human Female* (1953). The nation was shocked to hear that masturbation was virtually universal in his sample of men in a day when masturbation was still widely thought to impair health. At the time, it was also widely believed that nearly all single women were virgins. Yet Kinsey found that about one woman in three who remained single at age 25 reported having engaged in sexual intercourse.

Surveys, like case studies, also have sources of inaccuracy (Schwartz, 2007). People may recall their behavior inaccurately or deny or lie about it. Some people try to ingratiate themselves with their interviewers by answering in a socially desirable direction. (You can learn whether you tend to respond in the social desirable direction by taking the self-assessment at the end of the chapter.) The Kinsey studies all relied on male interviewers, but it has been speculated that female interviewees might have been more open with female interviewers. Similar problems may occur when interviewers and the people surveyed are from different ethnic or socioeconomic backgrounds. Other people may falsify attitudes and exaggerate problems to draw attention to themselves or to intentionally foul up the results.

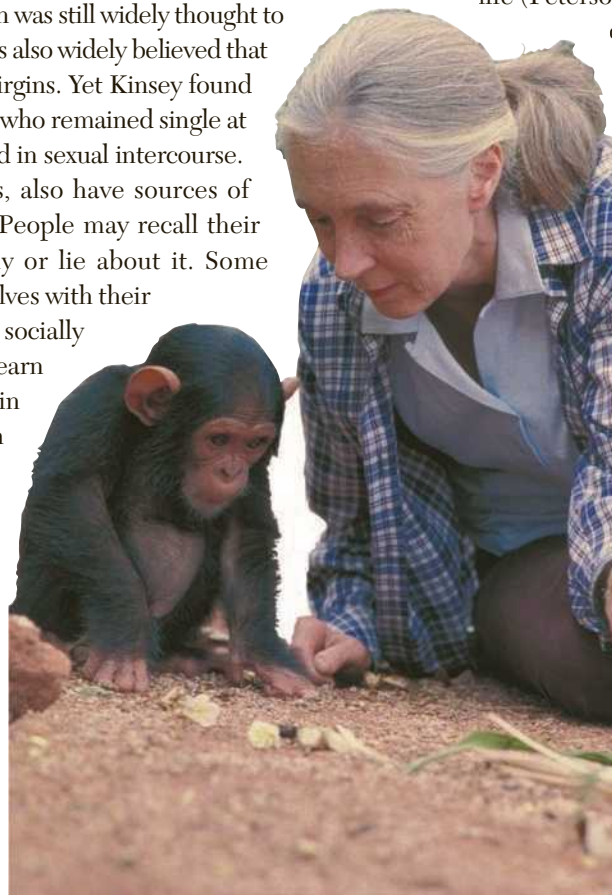
Consider some survey errors caused by inaccurate self-reports of behavior. If people brushed their teeth as often as they claimed and used the amount of toothpaste they indicated, three times as much toothpaste would be sold in the United States as is actually sold (Koerber et al., 2006). People also over report the extent to which they follow doctors' orders (Wilson et al., 2009) and underreport how much they smoke (Swan et al., 2007). Why do you think this is so?

NATURALISTIC OBSERVATION You use **naturalistic observation**—that is, you observe people in their natural habitats—every day. Naturalistic observation allows psychologists and other scientists to observe behavior where it happens, or “in the field.” Observers use unobtrusive measures to avoid interfering with the behaviors they are observing. For example, Jane Goodall has observed the behavior of chimpanzees in their natural environment to learn about their social behavior, sexual behavior, use of tools, and other facts of chimp life (Peterson, 2006; Pusey et al., 2008). Her

observations have shown us that (a) we were incorrect to think that only humans use tools and (b) kissing on the lips, as a greeting, is used by chimps as well as humans.

1-5b CORRELATION

Once psychologists have observed the behavior of their samples, they often use correlation to try to answer questions such as, are people with higher intelligence more likely to do well in school? Are people with a stronger need for achievement likely to climb higher up the corporate ladder? What is the relationship between stress and health?



Naturalistic Observation.

Jane Goodall's naturalistic observations revealed that chimpanzees—like humans—use tools and greet one another with a kiss.

survey a method of scientific investigation in which a large sample of people answer questions about their attitudes or behavior

naturalistic observation a scientific method in which organisms are observed in their natural environments

Kay & Kerl Anmann/BRUCE COLEMAN INC./Alamy Stock Photo

Correlation follows observation. By using the **correlational method**, psychologists investigate whether observed behavior or a measured trait is related to, or correlated with, another. Consider the variables of intelligence and academic performance. These variables are assigned numbers such as intelligence test scores and academic averages. Then the numbers are mathematically related and expressed as a **correlation coefficient** (r). A correlation coefficient is a number that varies from $r = +1.00$ to $r = -1.00$.

Studies report *positive correlations* between intelligence test scores and academic achievement, as measured, for example, by grade point averages. That is, the higher people score on intelligence tests, the better their academic performance is likely to be. Intelligence test scores tend to be positively correlated (about $r = +0.30$ to $r = +0.60$) with academic achievement (see Figure 1.6). But factors *other* than performance on intelligence tests also contribute to academic success. These include early learning opportunities, desire to get ahead, self-discipline, ability to manage stress, and belief in one's ability to succeed (Nisbett, 2013; Jennings et al., 2009; Thomas, 2008).

Many correlations are *negative correlations*; that is, as one variable increases, the other variable decreases. For example, there is a negative correlation between stress and health. As the amount of stress affecting us increases, the functioning of our

immune system decreases. Under high levels of stress, many people show poorer health.

What kinds of correlations (positive or negative) would you expect to find among behavior patterns such as the following: Churchgoing and crime? Language ability and musical ability? Grades in school and delinquency? Why?

Correlational research may suggest, but does not prove, cause and effect. For example, it may seem logical to assume that high intelligence makes it possible for children to profit from education. However, research has also shown that education contributes to higher scores on intelligence tests (Nisbett, 2009). Preschoolers who are placed in stimulating Head Start programs later attain higher scores on intelligence tests than age-mates who did not have this experience. What of the link between stress and health? Does stress impair health, or is it possible that people in poorer health encounter more stress?

1-5c THE EXPERIMENTAL METHOD

The preferred method for answering questions about cause and effect is the experiment. In an **experiment**, a group of participants obtains a treatment, such as a dose

correlational method

a mathematical method of determining whether one variable increases or decreases as another variable increases or decreases

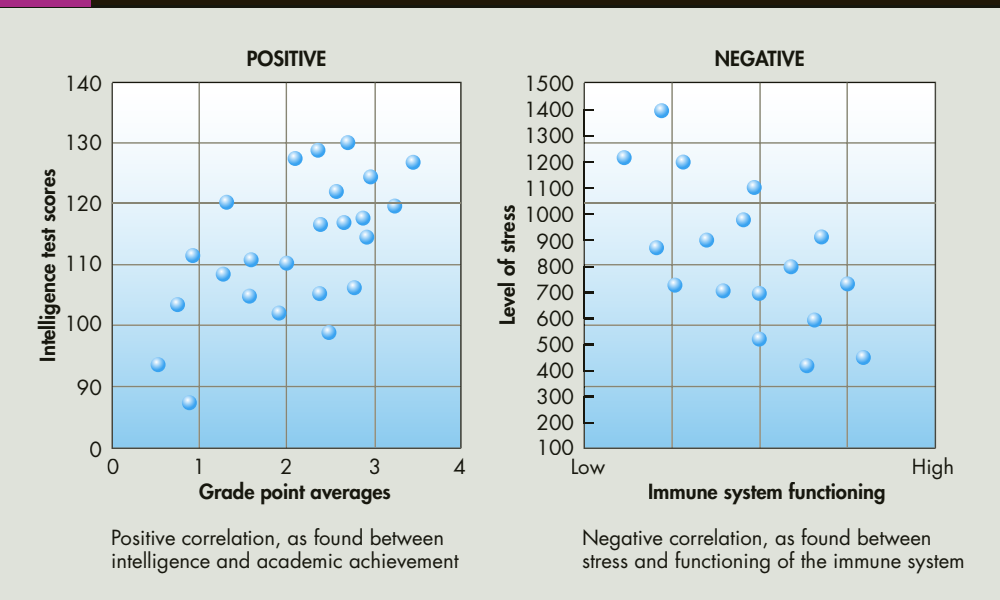
correlation coefficient

a number between $+1.00$ and -1.00 that expresses the strength and direction (positive or negative) of the relationship between two variables

experiment

a scientific method that seeks to confirm cause-and-effect relationships by introducing independent variables and observing their effects on dependent variables

FIG.1.6 CORRELATIONS



When there is a positive correlation between variables, as there is between intelligence and achievement, one increases as the other increases. By and large, the higher people score on intelligence tests, the better their academic performance is likely to be, as in the diagram on the left. (Each dot represents an individual's intelligence test score and grade point average.) But there is a negative correlation between stress and health. As the amount of stress we experience increases, the functioning of our immune system tends to decrease.