Key Questions/ Chapter Outline	Core Concepts	Psychology Matters
1.1 What Is Psychology—and What Is It *Not?*	• Psychology is a broad field, with many specialties, but fundamentally psychology is the science of behavior and mental processes.	**Thinking Critically about Psychology and Pseudopsychology** Six critical questions can help you distinguish scientific psychology from pseudopsychology.
Psychology: It's More Than You Think Psychology Is Not Psychiatry		
1.2 How Do Psychologists Develop New Knowledge?	• Psychologists, like all other scientists, use the scientific method to test their ideas empirically.	**Using Psychology to Learn Psychology** The Key Questions and Core Concepts can help you organize the material in your mind.
The Five Steps of the Scientific Method Five Types of Psychological Research Controlling Biases in Psychological Research Ethical Issues in Psychological Research Questions Science Cannot Answer		
1.3 What Are Psychology's Six Main Perspectives?	• Six main viewpoints dominate the rapidly changing field of modern psychology—the biological, cognitive, behavioral, whole-person, developmental, and sociocultural perspectives—each of which grew out of radical new concepts about mind and behavior.	**Psychology as a Major** To call yourself a psychologist, you'll need graduate training.
Separation of Mind and Body and the Modern Biological Perspective The Founding of Scientific Psychology and the Modern Cognitive Perspective The Behavioral Perspective: Rejection of Introspection and a Focus on Observable Behavior The Whole-Person Perspectives: Psychodynamic, Humanistic, and Trait and Temperament The Developmental Perspective: Changes Arising from Nature and Nurture The Sociocultural Perspective: The Individual in Context The Changing Face of Psychology		

Critical Thinking Applied

Facilitated Communication

chapter 1

mind, behavior, and psychological science

"After the kids had all that sugar—the cake, ice cream, punch, and candy—they were absolutely bouncing off the walls!" said one of our friends who was describing the recent birthday party for her 8-year-old daughter.

I must have had a skeptical look on my face, because she stopped her story short and asked, "You don't believe it?" Then she added, "You psychologists just don't believe in common sense, do you?"

I responded that what people think of as "common sense" can be wrong, reminding her that common sense once held that Earth was flat. "Perhaps," I suggested, "it might be wrong again—this time about the so-called sugar high that people think they observe."

"It could have been just the excitement of the party," I added.

"*Think* they observe?" my friend practically shouted. "Can you *prove* that sugar doesn't make children hyperactive?"

"No," I said. Science doesn't work that way. "But what I *could* do," I ventured, "is perform an experiment to test the idea that sugar makes children 'hyper.' Then we could see whether your claim passes or fails the test."

My timing wasn't the best for getting her involved in a discussion of scientific experiments, so let me pose the problem to you.

—RJ

PROBLEM: How would you test the claim that sugar makes children hyperactive?

We invite you to think how we might set up such an experiment. We could, for example, give kids a high-sugar drink and see what happens. But because people often see only what they expect to see, our expectations about sugar and hyperactivity could easily influence our observations. So, how could we design an experiment on the sugar problem that also accounts for our expectations? It is not an easy problem, but we will think it through together in this chapter.

Every chapter in the book will begin with a problem such as this—a problem aimed at getting you actively involved in learning psychology and thinking critically about some important concept in the chapter. Thinking these issues through with us, rather than just passively reading the words, will also help you develop a *schema* (a mental framework) that will make each of these concepts more meaningful and more easily remembered.

The important concept illustrated by the "sugar high" problem in this chapter is one of the most fundamental concepts in all of psychology: using the *scientific method* to explore the mind and behavior. But before we get into the nitty and gritty of the scientific method, let's be more specific about what we mean by the term *psychology* itself.

1.1 KEY QUESTION
WHAT IS PSYCHOLOGY—AND WHAT IS IT *NOT*?

"I hope you won't psychoanalyze me," says the student at the office door. It is a frequent refrain, and an occupational hazard for professors of psychology. But students need not worry about being psychoanalyzed—for two reasons. First, not all psychologists are trained to diagnose and treat mental problems, and they are in the minority among professors of psychology. Second, only a few psychologists are actually *psychoanalysts*. The term *psychoanalysis* refers to a highly specialized and not-very-common form of therapy. You will learn more about the distinction between psychologists and psychoanalysts later in the chapter—but, in the meantime, don't fret that your professor will try to find something wrong with you. In fact, your professor is much more likely to be interested in helping you learn the material than in looking for signs of psychological disorder.

So, you might wonder, if psychology is not all about mental disorders and therapy, what *is* it all about?

The term **psychology** comes from *psyche,* the ancient Greek word for "mind," and the suffix *-ology,* meaning "a field of study." Literally, then, *psychology* means "the study of the mind." Most psychologists, however, use the broader definition given in our Core Concept for this section of the chapter:

Psychology The science of behavior and mental processes.

core concept

Psychology is a broad field, with many specialties, but fundamentally psychology is the science of behavior and mental processes.

One important point to note about this definition: Psychology includes not only *mental processes* but *behaviors*. In other words, psychology's domain covers both the *internal* mental processes that we can observe only indirectly (such as thinking, feeling, and desiring) and *external,* observable behaviors (such as talking, smiling, and running). A second important part of our definition concerns the *scientific* component of psychology. In brief, the science of psychology is based on objective, verifiable evidence—not just the opinions of experts and authorities, as we often find in nonscientific fields. A more complete explanation of what we mean by "the science of psychology" will occupy the second part of this chapter.

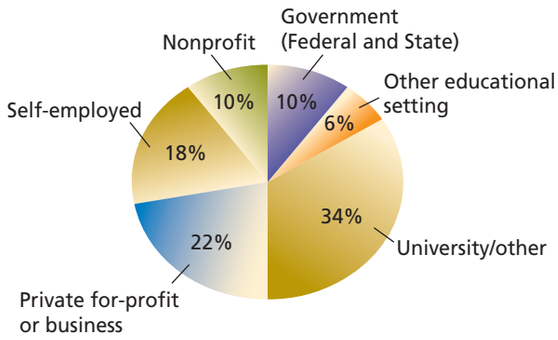


FIGURE 1.1
Work Settings of Psychologists

(*Source:* Updated information from *Employed Doctoral Scientists and Engineers, by Sector of Employment, Broad Field of Doctorate and Sex: 2001,* National Science Foundation.)

Psychology: It's More than You Think

Psychology covers more territory than most people realize. As we have seen, not all psychologists are therapists. Some work in education, industry, sports, prisons, government, churches and temples, private practice, and in the psychology departments of colleges and universities. (See Figure 1.1.) Other psychologists work for engineering firms, consulting firms, and the courts (both the judicial and the NBA variety). In these diverse settings, they perform a wide range of tasks, including teaching, research, assessment, and equipment design—as well as psychotherapy. In fact, psychology's specialties are too numerous to cover them all here, but we can give you the flavor of the field's diversity by first dividing psychology into three broad categories.

Three Ways of Doing Psychology Broadly speaking, psychologists cluster into three main categories: *experimental psychologists, teachers of psychology,* and *applied psychologists*. Some overlap exists among these groups, however, because many psychologists take on multiple roles in their work.

Experimental psychologists (sometimes called *research psychologists*) constitute the smallest of the three groups. Nevertheless, they perform most of the research that creates new psychological knowledge (Frincke & Pate, 2004). While some experimental psychologists can be found in industry or in private research institutes, the majority work at a college or university, where most also teach.

Teachers of psychology are traditionally found at colleges and universities, where their assignments most often involve not only teaching but research and publication. Increasingly, however, psychologists can be found at community colleges and high schools, where their teaching load is higher because these institutions generally do not require research (American Psychological Association, 2007b; Johnson & Rudmann, 2004).

Applied psychologists use the knowledge developed by experimental psychologists to tackle human problems, such as equipment design, personnel selection, and psychological treatment. They work in a wide variety of places, such as schools, clinics, factories, social service agencies, airports, hospitals, and casinos. All told, some 64 percent of the doctoral-level psychologists in the United States work primarily as applied psychologists, and that percentage has been steadily increasing since the 1950s (Kohout & Wicherski, 2000).

Applied Psychological Specialties Some of the most popular applied specialties include:

- *Industrial and organizational psychologists* (often called *I/O psychologists*) specialize in personnel selection and in tailoring the work

Experimental psychologists Psychologists who do research on basic psychological processes—as contrasted with applied psychologists; also called research psychologists.

Teachers of psychology Psychologists whose primary job is teaching, typically in high schools, colleges, and universities.

Applied psychologists Psychologists who use the knowledge developed by experimental psychologists to solve human problems.

environment to maximize productivity and morale. Some I/O psychologists also develop programs to train and retain employees; others may do market research.

- *Sports psychologists,* as you might expect, work with athletes to help them improve their performance by planning practice sessions, enhancing motivation, and learning to control emotions under pressure. Many major sports franchises have sports psychologists on staff.
- *Engineering psychologists* work at the interface between people and equipment. Some design airplane instrument displays or control panels, for easy and reliable human use. Some do psychological detective work to discover what went wrong in accidents attributed to "human error." Others may consult with architects or road builders to design conditions that will optimize traffic flow. Engineering psychologists usually work in private industry or in government—often on a team with other scientists.
- *School psychologists* have expertise in the problems of teaching and learning. Most school psychologists work for a school district, where they spend a good deal of time administering, scoring, and interpreting psychological tests. They also may diagnose learning and behavior problems and consult with teachers, students, and parents.
- *Rehabilitation psychologists* work with physicians, nurses, counselors, and social workers on teams that may treat patients having both physical and mental disorders, such as stroke, spinal cord injury, alcoholism, drug abuse, or amputation. Some work in a hospital setting. Others work for social service agencies and for sheltered workshops that provide job training for people with disabilities.

CONNECTION • CHAPTER 13
Clinical and counseling psychologists help people deal with mental disorders and other psychological problems.

- *Clinical psychologists* and *counseling psychologists* provide services for people having problems with social and emotional adjustment or those facing difficult choices in relationships, careers, or education. About half of all doctoral-level psychologists list clinical or counseling psychology as their specialty (American Psychological Association, 2003b). Clinicians are more likely to have a private practice involving psychological testing and long-term therapy, while counseling psychologists are more likely to work for an agency or school and to spend fewer sessions with each client.

Psychiatry A medical specialty dealing with the diagnosis and treatment of mental disorders.

More information on the career possibilities in psychology can be found in *Careers in Psychology for the Twenty-First Century,* published by the American Psychological Association (2003a).

Applying psychological principles of learning and motivation, sports psychologists work with athletes to improve performance.

Psychology Is Not Psychiatry

Just as beginning psychology students may think that all psychologists are clinical psychologists, they may not know the distinction between *psychology* and *psychiatry.* So let's clear up that confusion—just in case you encounter a test question on the topic.

Virtually all psychiatrists, but only some psychologists, treat mental disorders—and there the resemblance ends. **Psychiatry** is a medical specialty, not a part of psychology at all. Psychiatrists hold MD (Doctor of Medicine) degrees and, in addition, have specialized training in the treatment of mental and behavioral problems, typically with drugs. Therefore, psychiatrists are licensed to prescribe medicines and to perform other medical procedures. Consequently, psychiatrists tend to view patients from a *medical* perspective, as persons with mental "diseases."

By contrast, psychology is a much broader field that encompasses the whole range of human behavior and mental processes, from brain

function to social interaction and from mental well-being to mental disorder. For most psychologists, graduate training emphasizes research methods, along with advanced study in a specialty such as those listed earlier. Moreover, while psychologists usually hold doctoral degrees, their training usually is not *medical* training, although an exception involves a few clinical psychologists who have recently, under new laws in a handful of states, acquired the medical qualifications for prescribing drugs specifically for psychological problems. Most states, however, have yet to open the door to prescription privileges for psychologists (Holloway, 2004a,b; Practice Directorate Staff, 2005).[1]

So, now you know that psychiatry is not psychology. Now let's look at something else that often gets confused with psychology: *pseudopsychology*.

Fortune tellers, astrologers, and other practitioners of pseudopsychology don't bother to verify their claims with careful research—nor do their clients engage in critical thinking about such practices.

PSYCHOLOGYMATTERS

Thinking Critically about Psychology and Pseudopsychology

The TV series *Sci Fi Investigates* continues a long tradition that also included such programs as *The X Files* and *Unsolved Mysteries*. All have played on people's fascination with the fantastic and the paranormal—especially claims of mysterious powers of the mind and supernatural influences on our personalities. So does the horoscope in your daily newspaper. Never mind that astrology has been thoroughly debunked (Schick & Vaughn, 2001). The same goes for the supposed power of the full moon to encourage crime and mental disorder (Berman, 2003). Nor is there any factual basis for graphology (the bogus science of handwriting analysis), fortune telling, or the purported power of subliminal messages to make us buy products or vote for certain politicians. All these fall under the heading of **pseudopsychology:** unsupported psychological beliefs masquerading as scientific truth.

Certainly horoscopes and paranormal claims can be fun as pure entertainment, but it is important to keep pseudopsychology in perspective. Thus, one of the goals we have for this text is to help you *think critically* about extraordinary claims made about behavior and mental processes.

What Is Critical Thinking? Those who talk about "critical thinking" often find themselves in the position of Supreme Court Justice Potter Stewart, who famously was unable to define *pornography* but concluded, "I know it when I see it." Like Justice Stewart, your fearless authors (Phil, Bob, and Vivian) cannot offer a definition of critical thinking with which everyone will agree. Nevertheless, we are willing to jump into the fray with a list of the six **critical thinking skills** that we wish to emphasize in this book. Each is based on a question that we believe should be asked when confronting new ideas.

1. *What Is the Source?* Does the person making the claim have real expertise in the field? Suppose, for example, that you hear a newscast on which a politician or pundit declares that juvenile lawbreakers can be "scared straight" by a program in which they receive near-abusive treatment by felons who try to scare them away from a delinquent lifestyle with tales of the harsh life in prison. Such programs have, in fact, been tried in several states (Finckenauer et al., 1999). The first thing to ask is whether the person making the claim has

Pseudopsychology Erroneous assertions or practices set forth as being scientific psychology.

Critical thinking skills This book emphasizes six critical thinking skills, based on the following questions: What is the source? Is the claim reasonable or extreme? What's the evidence? Could bias contaminate the conclusion? Could the reasoning avoid common fallacies? Does the issue require multiple perspectives?

[1]Throughout this book you will find that we use brief citations in parentheses, calling your attention to a complete bibliographic reference found in the "References" section, beginning on p. R-1, near the end of this book. These brief in-text citations give the authors' last names and the publication date. With the complete references in hand, your library can help you find the original source.

any real knowledge of corrections—or, at the very least, has sought the counsel of someone with the necessary expertise.

Additionally, one should ask whether the source has something substantial to gain from the claim. If it's a medical breakthrough, does the claimant stand to make money from a new drug or medical device? In the case of a "scared straight" program, is the source trying to score political points?

2. *Is the Claim Reasonable or Extreme?* Life is too short to be critical of everything, of course, so the trick is to be selective. How? Critical thinkers are skeptical of claims touted as "breakthroughs" or "revolutionary." Likewise, claims that conflict with well-established knowledge should raise a red flag. In the case of "scared straight" programs—or any other quick fix for a difficult problem—one should be wary because simple solutions to complex problems rarely exist.
3. *What's the Evidence?* As the famous astronomer Carl Sagan once said about reports of people being abducted by aliens, "Extraordinary claims require extraordinary evidence" (Nova Online, 1996). Returning to our "scared straight" example, we should ask: Is there extraordinary evidence supporting the "scared straight" approach? Often those touting a new program will offer anecdotes and testimonials suggesting that the program has had a dramatic effect. Critical thinkers, though, know that testimonials and anecdotes, no matter how compelling, are not *evidence*. They merely represent the experiences of some individuals. But it would be risky to assume that what seems true for some people must also be true for everyone. To know for sure, scientific studies must be conducted. In fact, studies have shown not only that "scared straight" programs do not work but that they may actually inoculate juveniles against fears about prison. Surprising as it may seem, the hard evidence suggests that juveniles exposed to such treatments, on the average, subsequently get in *more* trouble than do those not given the "scared straight" treatment (Petrosino, Turpin-Petrosino, & Buehler, 2003).
4. *Could Bias Contaminate the Conclusion?* Critical thinkers know the conditions under which biases are likely to occur, and they are able to recognize common types of bias that we will examine in this chapter. For example, they would question whether medical researchers who are involved in assessing new drugs can be unbiased if they are receiving money from the companies whose drugs they are testing (McCook, 2006).

   The form of bias most applicable to our "scared straight" example is **emotional bias:** People not only fear crime and criminals, but they are often in favor of harsh treatments for criminal behavior, as we can see in the spate of "three strikes" laws passed by state legislators in recent years. Accordingly, the "scared straight" approach may appeal to people simply because of its presumed harshness, rather than because it works.

   Another especially common form of bias is **confirmation bias,** the all-too-human tendency to remember events that confirm our beliefs and ignore contradictory evidence (Halpern, 2002; Nickerson, 1998). Confirmation bias explains why believers in astrology remember the predictions that seemed accurate and forget about the ones that missed the mark. Confirmation bias also explains why gamblers have better recollections for the times they won than for those when they lost. And here's one more example: In an amazing brain-scan study done just before a recent presidential election, people with strong political opinions listened to contradictory statements made by one of their favorite politicians. When they did so, the brain circuits associated with reasoning suddenly shut down, while those parts of the brain most involved with emotion remained active (Shermer, 2006; Westen et al., 2006). It was as though the brain was saying, "I don't want to hear anything that conflicts with my beliefs." This brain-scan study, then, offers strong evidence that the

Emotional bias The tendency to make judgments based on attitudes and feelings, rather than on the basis of a rational analysis of the evidence.

Confirmation bias The tendency to attend to evidence that complements and confirms our beliefs or expectations, while ignoring evidence that does not.

brain itself can physically switch into a "confirmation bias mode," when it confronts contradictory evidence.

5. *Does the Reasoning Avoid Common Fallacies?* We will study several common logical fallacies in this book, but the one most applicable to the "scared straight" example is the assumption that "common sense" is a substitute for data. No matter how sensible the program may sound, there is no substitute for gathering some objective evidence.
6. *Does the Issue Require Multiple Perspectives?* The "scared straight" intervention makes the simplistic assumptions that (a) fear of punishment is the major deterrent to delinquency and (b) delinquent youth will respond positively to realistic threats of punishment. A more sophisticated view sees delinquency as a complex problem that demands scrutiny from several perspectives. Psychologists, for example, may look at delinquency from the standpoints of learning, social influence, or personality traits. Economists would be interested in the financial incentives for delinquency. And sociologists would focus on such things as gangs, poverty, and community structures. Surely such a multifaceted problem will require a more complex solution than a scary program.

Harmful Effects of Pseudopsychology But, you might ask, what's the big deal if people want to believe in pseudopsychological claims? Let's look at a few serious problems that such *un*critical thinking can cause.

In 1949, the Nobel Prize in medicine went to the inventor of the "lobotomy," a crude brain operation that disconnected the frontal lobes from the rest of the brain. The procedure had no careful scientific basis, yet it became popular because people who *wanted* it to work didn't ask critical questions. Originally intended as a treatment for severe mental disorders, the operation led instead to thousands of permanently brain-injured patients. Only after drugs for psychiatric disorders came into wide use in the 1950s did most of the world recognize the folly in this procedure.

For a modern example of pseudopsychology's harmful effects, we offer the widespread belief that positive thoughts can cure dire diseases, such as cancer. What could possibly be wrong with that idea? For one thing, the evidence doesn't support the notion that a person's state of mind affects the chances of recovery from a serious physical illness (Cassileth et al., 1985; Coyne et al., 2007). For another, the attitude-can-make-you-well belief can lead to blaming patients who do not get well for not having an attitude that was sufficiently optimistic (Angell, 1985; Becker, 1993).

Yet, countering pseudopsychological beliefs is not easy—and can even be dangerous. To see why, we have only to look back a few decades in parts of the United States, where a person who dared to question the widespread belief in the inferiority of African Americans risked being beaten, jailed, or lynched. Even today, in many regions of the world, posing critical questions about the status of women or ethnic prejudices can carry dire consequences.

In this book we will take a less dangerous approach—but still one that we hope will be productive. We will emphasize critical thinking in two ways. One involves the "problem" presented at the beginning of each chapter: For its solution, each of these problems will require both the critical thinking skills we have just described and some new knowledge to be developed in the chapter. The second way we will encourage you to think critically involves a special section at the end of every chapter, where we will model the critical thinking process as we consider a "hot button" issue related to the material in the chapter. If you disagree or have evidence that you think we should consider on one of these issues, we urge you to contact us and give us your critical take on the matter.

DO IT YOURSELF! Psychological Science or Psychobabble?

Now, let's put a sampling of your psychological beliefs to the test. Some of the following statements are true, and some are false. Don't worry if you get a few—or all—of the items wrong: You will have lots of company. The point is that what so-called common sense teaches us about psychological processes may not withstand the scrutiny of a scientific test. Mark each of the following statements as "true" or "false." (The answers are given at the end.)

1. _____ It is a myth that most people use only about 10% of their brains.
2. _____ During your most vivid dreams, your body may be paralyzed.
3. _____ Psychological stress can cause physical illness.
4. _____ The color red exists only as a sensation in the brain. There is no "red" in the world outside the brain.
5. _____ Bipolar (manic–depressive) disorder is caused by a conflict in the unconscious mind.
6. _____ The newborn child's mind is essentially a "blank slate" on which everything he or she will know must be "written" (learned) by experience.
7. _____ Everything that happens to us leaves a permanent record in memory.
8. _____ You were born with all the brain cells that you will ever have.
9. _____ Intelligence is a nearly pure genetic trait that is fixed at the same level throughout a person's life.
10. _____ Polygraph ("lie detector") devices are remarkably accurate in detecting physical responses that, in the eye of a trained examiner, reliably indicate when a suspect is lying.

Answers The first four items are true; the rest are false. Here are some brief explanations for each item; you will find more detail in the chapters indicated in parentheses. **1.** True: This is a myth. We use all parts of our brains every day. (See Chapter 2, "Biopsychology, Neuroscience, and Human Nature.") **2.** True: During our most vivid dreams, which occur during rapid eye movement sleep (REM), the voluntary muscles in our body are paralyzed, with the exception of those controlling our eyes. (See Chapter 8, "States of Consciousness.") **3.** True: The link between mind and body can make you sick when you are under chronic stress. (See Chapter 14, "Stress, Health, and Positive Psychology.") **4.** True: Strange as it may seem, all sensations of color are created in the brain itself. Light waves do have different frequencies, but they have no color. The brain interprets the various frequencies of light as different colors. (See Chapter 7, "Sensation and Perception.") **5.** False: There is no evidence at all that unconscious conflicts play a role in bipolar disorder. Instead, the evidence suggests a strong biochemical component. The disorder usually responds well to certain drugs, hinting that it involves faulty brain chemistry. Research also suggests that this faulty chemistry may have a genetic basis. (See Chapter 12, "Psychological Disorders," and Chapter 13, "Therapies for Psychological Disorders.") **6.** False: Far from being a "blank slate," the newborn child has a large repertoire of built-in abilities and protective reflexes. The "blank slate" myth also ignores the child's genetic potential. (See Chapter 6, "Psychological Development.") **7.** False: Although many details of our lives are remembered, there is no evidence that memory records all the details of our lives. In fact, we have good reason to believe that most of the information around us never reaches memory and that what does reach memory often becomes distorted. (See Chapter 4, "Memory.") **8.** False: Contrary to what scientists thought just a few years ago, some parts of the brain continue to create new cells throughout life. (See Chapter 2, "Biopsychology, Neuroscience, and Human Nature.") **9.** False: Intelligence is the result of both heredity and environment. Because it depends, in part, on environment, your level of intelligence (as measured by an IQ test) can change throughout your life. (See Chapter 5, "Thinking and Intelligence.") **10.** False: Even the most expert polygrapher can incorrectly classify a truth-teller as a liar or fail to identify someone who is lying. Objective evidence supporting the accuracy of lie detectors is meager. (See Chapter 9, "Emotion and Motivation.")

CheckYourUnderstanding

1. **RECALL:** In what way is modern psychology's scope broader than the Greek concept of *psyche?*
2. **RECALL:** Name two types of *applied* psychologists.
3. **RECALL:** Why is the notion that the full moon encourages crime and mental disorder an example of pseudopsychology?
4. **APPLICATION:** Which critical thinking questions discussed in this section would be most applicable to the argument that harsher sentences are the best way of dealing with crime, because "punishment is the only language that criminals understand"?
5. **RECALL:** Give an example of the potentially harmful effects of pseudopsychology.
6. **UNDERSTANDING THE CORE CONCEPT:** How is psychology different from psychiatry and other disciplines that deal with people?

Answers **1.** Modern psychology studies behavior, as well as the mind. **2.** There are many sorts of applied psychologists. The ones mentioned in this chapter are I/O psychologists, sports psychologists, engineering psychologists, school psychologists, rehabilitation psychologists, clinical psychologists, and counseling psychologists. **3.** The idea that the moon causes mental disorder is based on anecdote, but it has no scientific basis. The persistence of this belief is also a good illustration of confirmation bias. **4.** Probably the most applicable for this claim would be these: "What is the evidence?" and "Could bias contaminate the conclusion?" But we wouldn't disagree with any of the other critical thinking questions that you may have listed because; just as with the "scared straight" issue, they could all apply to a critical analysis of the claim. **5.** The ones listed in this section were lobotomies, use of "lie detectors," and the belief in the intellectual inferiority or superiority of some races. **6.** Psychology is a broader field, covering all aspects of behavior and mental processes.

1.2 KEY QUESTION
HOW DO PSYCHOLOGISTS DEVELOP NEW KNOWLEDGE?

As early as 1880, psychologists were challenging the claims of spiritualists and psychics (Coon, 1992). And today, psychology continues to dispute the unfounded claims of pseudoscience—which seem to blossom far faster than they can be nipped in the bud. Modern sources of such nonsense include astrologers, palm readers, and graphologists, along with an assortment of psychics, seers, and prophets who claim to have special insights into people's personalities and the ability to predict their futures.

So, what makes psychology different from these pseudopsychological approaches to understanding people? Answer: None of them have survived trial by the *scientific method,* which is a way of testing ideas against observations. Instead, pseudopsychology is based on speculation, confirmation bias, anecdote—and on human gullibility.

You might think this a snobbish view for psychologists to take. Why can't we make room for many different ways of understanding people? In fact, we do. Psychologists welcome sociologists, anthropologists, psychiatrists, and other scientists as partners in the enterprise of understanding people. We reject only those approaches that claim to have "evidence" but offer only anecdotes and testimonials.

So, what makes psychology a real science? Again, it's the *method*. As our Core Concept for this section says:

core concept

Psychologists, like all other scientists, use the scientific method to test their ideas empirically.

What is this marvelous method? Simply put, the **scientific method** is a way of putting ideas to an objective pass–fail test. The essential feature of this testing procedure is **empirical investigation,** the collection of objective information by means of careful measurements based on direct experience. Let's unpack this important concept a little more.

Literally, *empirical* means "experience based"—as contrasted with speculation based solely on reason, hope, authority, faith, or "common sense." Investigating a question empirically means collecting evidence carefully and systematically. From these empirical investigations, psychological science ultimately seeks to develop comprehensive explanations for behavior and mental processes. In science we call these explanations *theories*, a commonly misunderstood word.

"It's only a theory," people may say. But to a scientist, *theory* means something special. In brief, a scientific **theory** is a testable explanation for a set of facts or observations (Allen, 1995; Kukla, 1989). Obviously, this definition differs from the way people customarily use the term. In everyday language, *theory* can mean wild speculation or a mere hunch—an idea that has no evidence to support it. But to a scientist, a good theory has two attractive attributes: (a) the power to explain the facts and (b) the ability to be tested. Some theories have a great deal of evidence to support them, while others are highly speculative. Examples of well-supported theories include Einstein's theory of relativity, the germ theory of disease, and Darwin's theory of natural selection. And as you will see throughout this text, psychology has many well-supported theories, too.

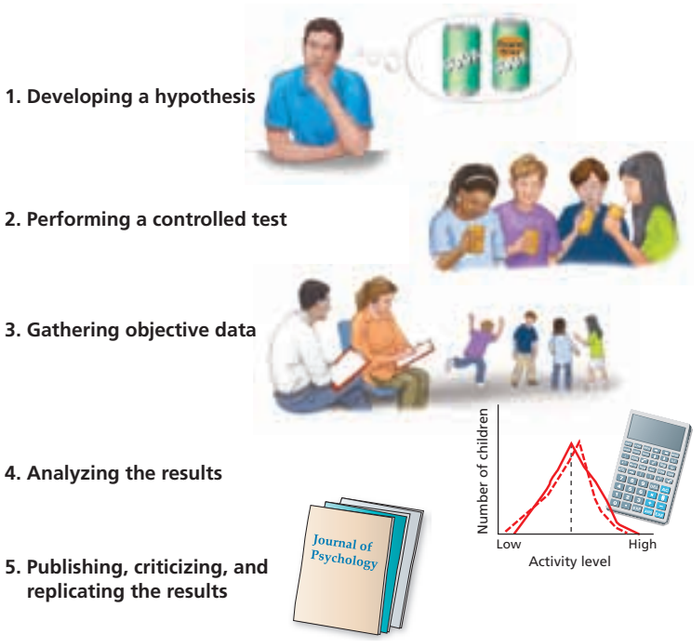
Now, to illustrate the scientific method in action, let's return to the problem we posed at the beginning of the chapter: How would you go about testing whether sugar causes hyperactivity in children? As we go through the steps of designing a scientific experiment to answer this question, please remember that there is usually more than one good way to perform an empirical investigation. Your ideas, even if they differ from ours, can be good ones, too, as long as they follow the requirements of good science.

Scientific method A five-step process for empirical investigation of a hypothesis under conditions designed to control biases and subjective judgments.

Empirical investigation An approach to research that relies on sensory experience and observation as research data.

Theory A testable explanation for a set of facts or observations. In science, a theory is not just speculation or a guess.

FIGURE 1.2
Five Steps of the Scientific Method



The Five Steps of the Scientific Method

Testing any scientific assertion requires five basic steps that we can illustrate by our experiment on the behavioral effects of sugar. (See Figure 1.2.) All scientists follow essentially the same steps, no matter whether their field is psychology, biology, chemistry, astronomy, or any other scientific pursuit. Thus, it is the *method* that makes these fields scientific, not their subject matter.

Developing a Hypothesis The scientific method first requires a testable idea, or prediction. Scientists call this prediction a **hypothesis.** The term literally means "little theory" because it often represents only one piece of a larger theoretical explanation. For example, a hypothesis suggesting that introverted people are attracted to extraverted people might be part of a theory tying together all the components of romantic attraction. Alternatively, a hypothesis can just be an interesting idea that piques our curiosity—as in our experiment on the effects of sugar on children.

To be testable, the hypothesis must be potentially *falsifiable*—that is, stated in such a way that it can be shown to be either correct or incorrect. So, if our hypothesis states that sugar causes children to become hyperactive, we could test it by having children consume sugar and then observing any effect on their activity level. If we find none, the hypothesis is falsified. (The hypothesis would *not* be falsifiable if we were merely to state a value judgment—for example, that sugar is "bad" for children.)

Next, the scientist must consider precisely how the hypothesis will be tested, which means specifying all aspects of the experiment in concrete terms called **operational definitions.** This requires that we specify the procedures (operations) to be used in conducting the experiment and measuring the results. The following examples, which could serve as operational definitions for our experiment, will help you understand this important idea.

- *Operational definition of children.* We can't test all the children in the world, of course. So, our operational definition of "children" might be all the third graders in one class at a nearby elementary school.

Hypothesis A statement predicting the outcome of a scientific study; a statement describing the relationship among variables in a study.

Operational definitions Objective descriptions of concepts involved in a scientific study. Operational definitions may restate concepts to be studied in behavioral terms (e.g., fear may be operationally defined as moving away from a stimulus). Operational definitions also specify the procedures used to produce and measure important variables under investigation (e.g., "attraction" may be measured by the amount of time one person spends looking at another).

- *Operational definition of sugar.* Likewise, we could specify what we mean by "sugar" as the amount of sugar in a commercial soft drink. If we decide, for example, to use 7Up as our sugar source, we could operationally define "sugar" as the 38 grams available in one can of 7Up. (Using a noncaffeinated beverage, such as 7Up, avoids the possibly confounding effects of caffeine on the children's behavior.)
- *Operational definition of hyperactive.* This one will be a bit more complicated. Suppose we have observers who will rate each child's behavior on the following 5-point scale:

passive		moderately active		very active
1	2	3	4	5

So, if our experimental design specifies giving some children a sugar-sweetened drink and others the same drink containing artificial sweetener, we can operationally define *hyperactive* as a significantly higher average rating for the group getting the sugared drink.

With our hypothesis and operational definitions in hand, we have taken the first step in our scientific study. But there is more to do: We still need to perform the actual experiment. (The great failing of pseudosciences like astrology or fortune-telling is that they never actually take this step of verifying or rejecting their assertions.)

Performing a Controlled Test To be ethical, our experiment should include only those children whose parents give permission for their participation. So, we might begin by explaining to parents and the teacher the broad outline of the experiment in the following way:

> We propose to examine the supposed effect of sugar on children's activity level. To do so, we have planned a simple study of the children in your child's third-grade classroom—subject to the permission of their parents. The procedure calls for dividing the children into two groups: At lunchtime, one group will be given a commercial soft drink (7Up) sweetened with sugar, while the other group will be given the same drink sweetened with an artificial sweetener (Diet 7Up). The children will not be told to which groups they have been assigned. For the rest of the school day, observers will rate the children's activity level. The ratings should show whether the group receiving the sugar-sweetened drink was more active than the other group. We will share the results with you at the end of the study.

Psychologists use special terms as a shorthand way of referring to the two groups to be compared in an experiment such as ours and to the two different treatment conditions to which they will be exposed. Those receiving the special treatment of interest are said to be in the *experimental condition.* (In our study, the experimental condition involves the high-sugar drink.) Individuals exposed to the experimental condition, then, make up the **experimental group.** Meanwhile, those in the **control group** enter the *control condition,* where they do *not* receive the special treatment. (In our study, the control group will get the artificially sweetened drink.) Thus, the control group serves as a standard against which to compare those in the experimental group. (See Figure 1.3.)

In the most basic experimental design, the researcher varies one factor and holds all the other experimental conditions constant. Scientists call that one variable factor the **independent variable.** (In our experiment, the different amounts of sugar given to the two groups constitute the independent variable.) By manipulating the independent variable in this way, the experimenter can determine whether that factor *causes* any observed effect. You can think of the independent variable as a factor that the experimenter changes *independently* of all the other carefully controlled experimental conditions.

Experimental group Participants in an experiment who are exposed to the treatment of interest.

Control group Participants who are used as a comparison for the experimental group. The control group is not given the special treatment of interest.

Independent variable A stimulus condition so named because the experimenter changes it independently of all the other carefully controlled experimental conditions.

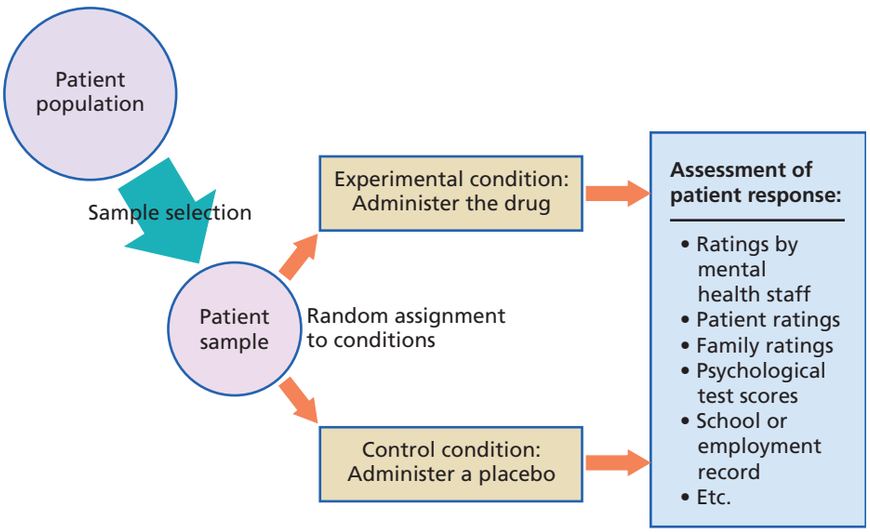


FIGURE 1.3
Experimental Groups and Control Groups in a Drug Study

Well-designed experiments often compare the responses of an experimental group and a control group, as in this design for evaluating a new drug.

One more issue to consider in designing and conducting an experiment involves the selection of participants in such a way that the experimental and control groups are essentially the same—except for the experimental treatment they receive. The important thing is that we don't want to mistake some preexisting difference between the two groups for the effects of the independent variable. So, in our study of sugar and activity level, it wouldn't do to put all the girls in one group and all the boys in the other. (Why not? There could be gender differences in their physical reactions to sugar. In addition, one sex might be better than the other at controlling their reactions.) Nor would it be a good idea to have shy children in one group and outgoing children in the other (because the shy children are likely to be less active in the first place). In brief, experimenters must find a way to avoid systematic bias in assigning individuals to the experimental or control group. A good solution involves **random assignment,** where participants are assigned to each group by chance alone. One way to do this would be to list the children alphabetically and then assign alternating names to the experimental and control groups. In this way, chance minimizes any potential differences between the two groups. This, in turn, assures that any differences in activity level are truly due to sugar rather than some other factor.

Random assignment A process used to assign individuals to various experimental conditions by chance alone.

Data Pieces of information, especially information gathered by a researcher to be used in testing a hypothesis. (Singular: datum.)

Dependent variable The measured outcome of a study; the responses of the subjects in a study.

Gathering Objective Data In the third step of the scientific method, the scientist collects objective **data:** information gathered by direct observation. In our experiment, the data will consist of the observers' ratings of the children's activity level. Scientists refer to such data as the **dependent variable.** The term comes from the expectation that the responses of participants in an experiment will *depend* directly on the conditions to which they have been exposed. (You might think of the independent variable as the *stimuli* you are studying and the dependent variable as the *responses* made by the participants in your experiment.)

Analyzing the Results and Accepting or Rejecting the Hypothesis In the fourth step of the scientific method, the researcher examines the results (the data) to see whether the hypothesis survived the test or whether it must be rejected.

This step usually requires some special mathematical analysis, particularly if the data require a close call. Statistics can tell the researcher whether the observed results are likely due to the independent variable or merely due to chance. A detailed explanation of statistics lies beyond the scope of this book. In fact, it's a subject for a whole course in itself. But to give you a glimpse of this world, we have provided a brief introduction to statistics in the Appendix, which can be found online.

In our experiment, the statistical analysis will be relatively straightforward, because we merely want to know whether scores for the children receiving sugar are higher than those taking the sugar-free drink. If so, we can declare that our hypothesis has been supported. If not, we will reject the hypothesis.

Publishing, Criticizing, and Replicating the Results In the final step of the scientific method, researchers find out whether their work can withstand the scrutiny and criticism of the scientific community. To do so, they communicate their results to colleagues by publishing them in a professional journal, making a presentation at a professional meeting, or writing a book. Then the researchers must wait for the critics to respond.

If colleagues find the study interesting and important—and especially if it challenges other research or a widely held theory—the critics may look for flaws in the research design: Did the experimenters choose the participants properly? Were the statistical analyses done correctly? Could other factors account for the results? Alternatively, they may decide to check the study by *replicating* it. To **replicate** the experiment they would redo it, to see whether they would get the same results.

In fact, our study of the effects of sugar on children is a simplified replication of research done previously by Mark Woolraich and his colleagues (1994). Their study lasted three weeks and compared an experimental group of children who ate a high-sugar diet with a control group given a low-sugar diet with artificial sweeteners. Contrary to folk wisdom, the researchers found no differences between the groups in behavior or cognitive (mental) function. So, if our study were to find a "sugar high" effect, it would contradict the Woolraich findings, and you can be sure that it would receive careful scrutiny and criticism.

Criticism also goes on behind the scientific scenes to filter out poorly conceived and executed research prior to publication. Journal editors and book publishers (including the publishers of this book) routinely seek the opinions of expert reviewers. As a result, authors usually receive helpful, if sometimes painful, suggestions for revision. Only when a hypothesis has cleared all these hurdles will editors put it in print and scholars tentatively accept it as scientific "truth."

We should emphasize, however, that scientific findings are always tentative. As long as they stand, they stand in jeopardy from a new study that requires a new interpretation or sends earlier work to the academic scrap heap. Consequently, the results of both our sugar study and the Woolraich sugar study could be eventually replaced by better, more definitive knowledge. Obviously, then, the scientific method is an imperfect system, but it is the best method ever developed for testing ideas about the natural world. As such, it represents one of humankind's greatest intellectual achievements.

Five Types of Psychological Research

We're not out of the scientific woods yet—even though we have covered the basic steps of science's experimental method. We still need to consider other forms that psychological research may take. Aside from *experiments,* scientists do *correlational studies, surveys, naturalistic observations,* and *case studies.* Each, we will see, has its advantages, limitations, and special applications.

Replicate In research, this refers to doing a study over to see whether the same results are obtained. As a control for bias, replication is often done by someone other than the researcher who performed the original study.

Experiments In a well-designed **experiment,** all the conditions that could potentially influence the results come under the researcher's control. Thus, we sought to control the other conditions under which the children were tested in our "sugar" study: By using children in a single classroom and randomly assigning them to the two experimental conditions, we were able to assure that all the variables for both groups were the same—except for the amount of sugar they ingested. This allows us to be confident that the results were due to the effects of sugar, rather than any other factors.

Correlational Studies Sometimes scientists cannot gain enough control over the situation to allow them to conduct a true experiment. Here's an example: Suppose that you wanted to test the hypothesis that children who ingest lead-based paint (common in older homes, especially in low-income urban housing) run an increased risk of learning disabilities. You couldn't do an experiment to verify this hypothesis. Why? In an experiment you would have to manipulate the independent variable—which would mean giving toxic material to a group of children. Obviously, this would be harmful and unethical.

Fortunately, you can find a way around the problem—but at the expense of some control over the research conditions. The solution takes the form of a **correlational study.** In correlational research you, in effect, look for a "natural experiment" that has already occurred by chance in the world outside the laboratory. So, in a correlational study on the effects of ingesting lead-based paint, you might look for a group of children who had already been exposed to leaded paint. Then, you would compare them to another group who had not been exposed. As a further control, you should try to match the groups so that they are comparable in every conceivable respect (such as age, family income, and gender)—except for their exposure to leaded paint.

The big drawback of a correlational study is that you can never be confident that the groups are really comparable, because you did not randomly assign people to test groups or manipulate the independent variable. In fact, the groups may differ on some important variables (such as access to health care or nutrition) that you may have overlooked. Thus, you cannot say with certainty that the condition of interest was the *cause* of the effects you observed. So, even if you observe more learning disabilities among children who were exposed to lead-based paint, you cannot conclude that exposure to the paint *caused* the disabilities. The most you can say is that lead-based paint is *correlated* or associated with learning disabilities. Scientists often put the general principle this way: *Correlation does not necessarily mean causation.* In fact, confusing correlation with causation is one of the most common critical thinking errors, and is an example of a fallacy in reasoning.

Researchers usually express the degree of correlation as a number known as the *correlation coefficient,* often symbolized in formulas by the letter *r.* The size of the correlation coefficient summarizes the relationship between the two variables: It can range from a negative number (as low as –1.0) to a positive number (as high as +1.0). We won't go into the details of calculating the correlation coefficient here, but any introductory statistics book will tell you how to do it. You can also find more information about correlations in the Appendix online.

The important thing is for you to develop a feeling for what *positive correlation, negative correlation,* and *zero correlation* mean. (See Figure 1.4.) If the variables have *no relationship* at all, their correlation is zero. You would expect a zero correlation between height and GPA, for example. If, however, the two variables show a relationship in which they vary in the same direction (as one variable increases, so does the other) then we say they have a **positive correlation.** An example of a positive correlation is the moderate relationship between SAT scores and college grades (which is approximately +0.4). In other words, as SAT scores increase, grades in college also increase.

Experiment A kind of research in which the researcher controls all the conditions and directly manipulates the conditions, including the independent variable.

Correlational study A form of research in which the relationship between variables is studied, but without the experimental manipulation of an independent variable. Correlational studies cannot determine cause-and-effect relationships.

Positive correlation A correlation coefficient indicating that the variables change simultaneously in the same direction: As one grows larger or smaller, the other grows or shrinks in a parallel way.

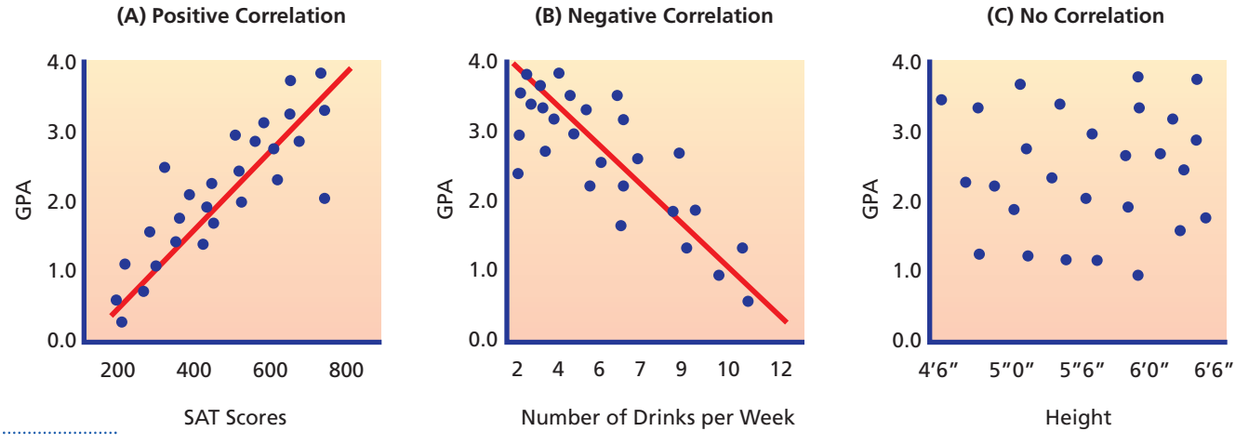


FIGURE 1.4
Three Types of Correlation

The graphs illustrate the three main types of correlation, with data points for 27 individuals. (A) shows a *positive correlation* between SAT scores and GPA; (B) shows a *negative correlation* between alcohol consumption and GPA; and (C) shows *no correlation* between height and GPA.

But when one variable decreases as the other increases, they have a **negative correlation,** and their correlation coefficient would have a negative sign. You would probably find a negative correlation between the amount of alcohol consumed by college students and their grade-point averages (as college students increase their consumption of alcohol, their grade-point averages decrease). In our earlier example, we might have predicted a negative correlation between lead levels in the blood and IQ scores.

It is also important to understand that *a correlation can show a strong relationship even when it is negative*. (*Note:* Professors often ask test questions about this!) Let us suppose that we find a negative correlation of –0.7 between some measure of anxiety and time spent studying. In other words, more anxiety is correlated with less studying. Even though this is a negative correlation, it shows a *stronger* relationship than, for example, the positive correlation between SAT scores and grades (+0.4) that we cited earlier.

Surveys If you want to know people's attitudes, preferences, or other characteristics, you don't need to perform an experiment or a correlational study. Instead, you can simply ask them for the information, using a **survey.** It is a method widely used by political pollsters and marketing consultants, as well as by many researchers in psychology and sociology. Surveys typically ask people for their responses to a prepared set of questions. The survey method offers the advantage of generating large numbers of respondents with relative ease. But the value of a survey is only as good as the honesty of the respondents' reports (Schwarz, 1999). Two other important factors affecting survey results include the *wording of the questions* (Are they clear? Are they biased?) and the *sample* (How well do the respondents represent the group of interest to the pollsters?).

Naturalistic Observations In her classic studies showing that chimpanzees have a complex, tool-making culture, Jane Goodall just observed chimps in their natural jungle setting. Likewise, when psychological researchers want to know how people act in their natural surroundings (as contrasted with the artificial conditions of a laboratory), they use the same method of **naturalistic observation.** This approach might also be a good choice for studying child-rearing practices, shopping habits, or how people flirt in public. Thus, the setting for a naturalistic

Negative correlation A correlation coefficient indicating that the variables change simultaneously in opposite directions: As one becomes larger, the other gets smaller.

Survey A technique used in descriptive research, typically involving seeking people's responses to a prepared set of verbal items.

Naturalistic observation A form of descriptive research involving behavioral assessment of people or animals in their home surroundings.

Jane Goodall used the method of naturalistic observation to study chimpanzee behavior.

In his book **Even the Rat Was White,** *Robert Guthrie called attention to the neglect of contributions by African Americans in psychology.*

observation could be as varied as a home, a shopping mall, a lunchroom, or a remote wilderness. This is the point to remember: Naturalistic observations are made under far less controlled conditions than are experiments because the researcher merely observes and records behaviors, rather than manipulating the environment. We should be clear, however, that the best naturalistic observations follow a carefully thought-out plan. Nevertheless, when doing this sort of research, the scientist must be especially cautious about jumping to cause-and-effect conclusions.

Case Studies How might you do a study to find out what factors shaped comedian Eddie Murphy's sense of humor? You can't have an experimental and a control group, because you have only one Eddie Murphy. A well-controlled study is obviously out of the question, so the researcher will probably turn to yet another kind of research, the **case study,** which focuses on only a few individuals—sometimes just one. Scientists usually reserve this approach for the in-depth study of unusual people with rare problems or unusual talents. For example, in his book *Creating Minds,* Howard Gardner (1993) used the case study method to explore the thought processes of several highly creative individuals, including Einstein, Picasso, and Freud. Therapists who use case studies to develop theories about mental disorder sometimes call this the *clinical method.* By either name, the disadvantages of this approach lie in its subjectivity, its small sample size, and the lack of control over the variables that could affect the individuals under study. These limitations severely restrict the researcher's ability to draw conclusions that can be applied with confidence to other individuals. Nevertheless, the case study can sometimes give us valuable information that could be obtained in no other way.

Controlling Biases in Psychological Research

Assisted suicide. Abortion. Capital punishment. Do you have strong feelings and opinions on any of these issues? Emotion-laden topics such as these can bring out biases that make critical thinking difficult, as we have seen. The possibility of bias, then, poses problems for psychologists interested in studying such issues as child abuse, gender differences, or the effects of racial prejudice—topics that may interest them precisely because of their own strong opinions. Left uncontrolled, researchers' biases can affect the ways they design a study, collect the data, and interpret the results. Let's take a look at two forms of bias that require special vigilance in research.

Emotional bias, which we discussed earlier in connection with critical thinking, involves an individual's cherished beliefs, strong preferences, unquestioned assumptions, or personal prejudices. Often these are not obvious to the individual who has such biases. For example, in his book *Even the Rat Was White,* psychologist Robert Guthrie (1998) points out the bias in the long psychological tradition of using mainly white participants (usually college students) in research—without even realizing that they were introducing bias with their sample-selection procedures. This practice, then, diminished the applicability of the research results to people-in-general. Fortunately, the scientific method, with its openness to peer criticism and replication, provides a powerful counterbalance to an experimenter's emotional bias. Still, scientists would prefer to identify and control their biases before possibly erroneous conclusions hit print.

Expectancy bias can also affect scientists' conclusions when they observe only what they *expect* to observe. (You can see a close kinship here with *confirmation bias,* also discussed earlier.) For example, we can see expectancy bias at work in a study in which psychology students trained rats to perform behaviors such as pressing a lever to obtain food (Rosenthal & Lawson, 1964). The experimenters told some students that their rats were especially bright; other students heard that their rats were slow learners. (In fact, the experimenters had randomly

Case study Research involving a single individual (or, at most, a few individuals).

Expectancy bias The researcher allowing his or her expectations to affect the outcome of a study.

selected both groups of rats from the same litters.) Sure enough, the students' data showed that rats believed to be bright outperformed their supposedly duller littermates—in accord with the students' expectations. How could this be? Apparently, rats perform better for an enthusiastic audience! Follow-up questionnaires showed that the students with the "bright" rats were "more enthusiastic, encouraging, pleasant, and interested in their rat's performance."

Not only can these sources of bias lead to erroneous conclusions, but they can also produce expensive or even dangerous consequences. Imagine that you are a psychologist working for a pharmaceutical company that wants you to test a new drug. With millions of dollars riding on the outcome, you may not be thinking with complete objectivity. And what about the doctors who are going to be prescribing the drug to patients in your study? Surely those doctors will have high hopes for the drug, as will their patients. And so the stage is set for your own bias to creep into the study along with the expectations of other involved.

A common strategy for controlling expectancy bias in drug studies is to keep participants in the research experimentally "blind," or uninformed, about whether they are getting the real drug or a **placebo** (a sham "drug" with no medical value). An even better strategy is a **double-blind study**, which involves keeping *both* the participants and the experimenter clueless about which group receives which treatment. In a drug study, this would mean that neither the researchers nor the participants would know (until the end of the study) which individuals were getting the new drug and which were getting the placebo. This scientific trick controls expectations by assuring that the experimenters will not inadvertently treat the experimental group differently from the control group. It also controls for expectations of those receiving treatment, because they are also "blind" to which group they have been assigned.

As you can imagine, expectancy bias could affect the response of the children in our sugar study. Similarly, the expectations of the observers could color their judgments. To prevent this, we should incorporate a double-blind procedure into our experimental design.

CONNECTION • CHAPTER 7

For many people, the brain responds to placebos in much the same way that it responds to pain-relieving drugs.

Placebo *(pla-SEE-bo)* Substance that appears to be a drug but is not. Placebos are often referred to as "sugar pills" because they might contain only sugar, rather than a real drug.

Double-blind study An experimental procedure in which both researchers and participants are uninformed about the nature of the independent variable being administered.

Ethical Issues in Psychological Research

Research also can involve serious ethical issues, such as the possibility of people being hurt or unduly distressed. No researcher would want this to happen, yet the issues are not always clear. Is it ethical, for example, in an experiment on aggression, to deliberately provoke people by insulting them? What degree of stress is too high a price to pay for the knowledge gained from the experiment? Such ethical issues raise difficult, but important, questions, and not all psychologists would answer them in exactly the same way.

To provide some guidelines for researchers, the American Psychological Association (APA) publishes *Ethical Principles of Psychologists and Code of Conduct* (2002). This document not only deals with the ethical obligation to shield research participants from potentially harmful procedures, but it also admonishes researchers that information acquired about people during a study must be held confidential (Knapp & VandeCreek, 2003; Smith, 2003a,b).

Deception The use of *deception* poses an especially knotty problem for researchers in psychology. The *Ethical Principles* document states that, under most circumstances, participation in research should be voluntary and informed. That is, we should advise volunteers of what challenges they will face and give them a real opportunity to opt out of the study. But the issue can be more complicated than it first appears. What if you are interested in the "good Samaritan" problem: the conditions under which people will help a stranger in distress? If you tell people that you have contrived a phony emergency situation and ask them whether they are willing to help, you will spoil the very effect that you are trying to study. Consequently, the guidelines do allow for deception under some conditions, provided that no substantial risks are likely to accrue to the participants.

You might well ask, "Who judges the risks?" Most places where research is done now have watchdog committees, called *institutional review boards* (IRBs) that make these judgments by examining all studies proposed to be carried out within an institution, such as a college, university, or clinic. Further, when a researcher uses deception, the APA guidelines require that participants be informed of the deception as soon as is possible without compromising the study's research goals. Individuals used in deceptive research must also be *debriefed* after the study to make sure that they suffer no lasting ill effects. Despite these precautions, some psychologists stand opposed to the use of deception in any form of psychological research (Baumrind, 1985; Ortmann & Hertwig, 1997).

Animal Studies Another long-standing ethical issue surrounds the use of laboratory animals, such as rats, pigeons, and monkeys. Animals make attractive research subjects because of the relative simplicity of their nervous systems and the ease with which a large number of individuals can be maintained under controlled conditions. Animals also have served as alternatives to humans when a procedure was deemed risky or outright harmful, such as implanting electrodes in the brain to study its parts.

With such concerns in mind nearly 100 years ago, officers of the American Psychological Association established a Committee on Precautions in Animal Experimentation, which wrote guidelines for animal research (Dewsbury, 1990). More recently, the APA's *Ethical Principles* document reiterated the experimenter's obligation to provide decent living conditions for research animals and to weigh any discomfort caused them against the value of the information sought in the research. Additional safeguards appear in a 1985 federal law that regulates animal research (Novak & Suomi, 1988).

TABLE 1.1 What Questions Can the Scientific Method *Not* Answer?

The scientific method is not appropriate for answering questions that cannot be put to an objective, empirical test. Here are some examples of such issues:

Topic	Question
Ethics	Should scientists do research with animals?
Values	Which culture has the best attitude toward work and leisure?
Morality	Is abortion morally right or wrong?
Preferences	Is rap music better than blues?
Aesthetics	Was Picasso more creative than Van Gogh?
Existential issues	What is the meaning of life?
Religion	Does God exist?
Law	What should be the speed limit on interstate highways?

Although science can help us understand such issues, the answers ultimately must be settled by logic, faith, legislation, consensus, or other means that lie beyond the scope of the scientific method.

Recent years have seen a renewal of concern, both inside and outside of psychology, about the use of animals as research subjects, particularly when the research involves painful or damaging procedures, such as brain surgery, electrode implants, or pain studies. Some people feel that the limitations should be more stringent, especially on studies using humanlike animals, such as chimpanzees. Others believe that limitations or outright bans should apply to all animal research, including studies of simple animals such as sea slugs (which are often used in neurological studies). While many psychologists support animal research under the APA guidelines, the issue remains a contested one (Bird, 2005; Plous, 1996).

Questions Science Cannot Answer

You should understand that we are *not* saying that science can give us answers to every important question in our lives. Even scientists themselves don't take a scientific approach to everything. The scientific method is simply the best way to find answers to testable questions about the natural world—the world of atoms and animals, of stones and stars, and of behavior and mental processes. So, what are science's boundaries and limitations? Science is *not* appropriate for answering questions that cannot be empirically tested—such as questions of ethics, morality, religious beliefs, or preferences. For some examples of questions that science can never answer, please see Table 1.1.

PSYCHOLOGYMATTERS

Using Psychology to Learn Psychology

In this book, your authors have attempted to help you find meaningful patterns that will aid you in making a mental map (sometimes called a *cognitive map* or *concept map*) of every chapter. To do so, we have built in many learning devices. Among the most important are numbered Key Questions and Core Concepts. Let us show you how using these features can make your study of psychology easier.

The Key Questions, which act as the main headings in each chapter, give you a "heads up" by signaling what to watch for as you read. For example,

Key Question 1.2 for this section of the chapter asked, HOW DO PSYCHOLOGISTS DEVELOP NEW KNOWLEDGE? This should alert you to the idea that psychologists must have a special method for developing new knowledge and that you should be alert to what the method is. The larger point is that you are much more likely to remember new concepts if you approach them with an appropriate Key Question in mind (Glaser, 1990). You can also use the Key Question as a review-check of your understanding of each section before the next test. If you have a study partner, try asking each other to give detailed answers to the Key Questions.

You can think of Core Concepts as brief answers to the Key Questions. (In fact, each one is numbered to match its Key Question.) A Core Concept also highlights the central idea in each chapter section—much like a preview of coming attractions. It is important to realize that a Core Concept is not a complete answer but a capsule summary of ideas to be fleshed out. As you come to understand the meaning of a Core Concept, you will see that the details of the section—the terms, names, and important research—will fall easily into place. And to reinforce your understanding, it is a good idea to revisit the Core Concept after you have finished reading the section. In fact, this is precisely what the brief end-of-section quizzes (Check Your Understanding) are designed to do.

Another good way to use the Core Concepts is to see whether you can explain how the terms in boldface link to the Core Concepts. Let's take Core Concept for this section, which says:

> **Psychologists, like all other scientists, use the scientific method to test their ideas empirically.**

This should alert you that there are two especially important ideas that will be described in this section: *scientific method* and *testing ideas empirically.* Knowing this will help you find the important ideas and organize them in your mind.

In summary, then, the Key Questions and Core Concepts are designed to pose important questions that lead you to the big ideas in the chapter. They will help you step back from the details to see meaningful patterns—as the saying goes, to distinguish the forest from the trees.

CheckYourUnderstanding

1. **RECALL:** What is the difference between a scientific theory and a mere opinion?
2. **APPLICATION:** Which of the following could be an operational definition of "fear"?
   a. an intense feeling of terror and dread when thinking about some threatening situation
   b. panic
   c. a desire to avoid something
   d. moving away from a stimulus
3. **ANALYSIS:** Identify the only form of research that can determine cause and effect. Why is this so?
4. **ANALYSIS:** Why would an experimenter randomly assign participants to different experimental conditions?
5. **ANALYSIS:** Which one of the following correlations shows the strongest relationship between two variables?
   a. +0.4
   b. +0.38
   c. -0.7
   d. .05
6. **ANALYSIS:** What would be a good method for controlling expectancy bias in research on a new drug for depression?
7. **RECALL:** Why does research using deception pose an ethical problem?
8. **UNDERSTANDING THE CORE CONCEPT:** What do scientists mean by *empirical observation?*

Answers **1.** A scientific theory is a testable explanation for the available facts or observations. An opinion is not necessarily testable, nor does it necessarily attempt to explain all the relevant information. **2.** d. (because it is the only one couched in terms of behaviors that can be observed objectively) **3.** Only the experiment can determine cause and effect, because it is the only method that involves manipulation of the independent variable. **4.** Random assignment helps insure that the experimental and control groups are comparable. **5.** c. **6.** A double blind study, because it controls for the expectations of both the experimenter and the participants who receive the drug. **7.** Deception involves a conflict with the principle that participants in research should give their informed consent. (Deception is, however, permitted under certain circumstances specified in the Ethical Principles document.) **8.** Empirical observation requires making careful measurements based on direct experience.

1.3 KEY QUESTION
WHAT ARE PSYCHOLOGY'S SIX MAIN PERSPECTIVES?

The shape of modern psychology has been molded by its history, which dates back some 25 centuries to the Greek philosophers Socrates, Plato, and Aristotle. These sages not only speculated about consciousness and madness; they also knew that emotions could distort thinking and that our perceptions are interpretations of the external world. Even today, people would probably agree with many of these ancient conjectures—and so would modern psychology.

But the Greeks also came up with some psychological notions that seem odd to the modern mind. They believed, for example, that emotions flowed from the heart, the liver, and the spleen and that mental disorder could be caused by excess bile. Strange as these ideas now sound, we still use the metaphor of "heartfelt" emotions and may even speak of "venting the spleen," as a figure of speech for anger.

Yet, the Greeks get only partial credit for laying the foundations for psychology. At roughly the same time, Asian and African societies were developing their own psychological ideas. In Asia, followers of Yoga and Buddhism were exploring consciousness, which they attempted to control with meditation. Meanwhile, in Africa, other explanations for personality and mental disorder were emerging from traditional spiritual beliefs (Berry et al., 1992). Based on these *folk psychologies,* shamans (healers) developed therapies rivaling in effectiveness the treatments used in psychology and psychiatry today (Lambo, 1978). It was, however, the Greek tradition and, later, the Church that most influenced the winding developmental path of Western psychology as a science.

Oddly, it never occurred to any of the ancient thinkers to put their speculations to a test in the same way that we planned the test for our hypothesis about sugar and hyperactive behavior. In the Greek mind, truth came from simple observation, logic, and the authority of experts. The breakthrough idea of a controlled experiment wouldn't appear for more than two thousand years.

Fast forwarding just a dozen centuries, we find the medieval Church in control of Europe, with its clerics actively suppressing inquiry into human nature. Why? Part of the answer was an attempt to discourage interest in the "world of the flesh." The other part of the answer lay in the conviction that the mind and soul were inseparable, operating outside the natural laws that govern worldly objects and events. For medieval Christians, the human mind—like the mind of God—presented a mystery that mortals should never try to solve.

Change of this entrenched viewpoint did not come easily. It took a series of radical new ideas, spaced over several hundred years, to break the medieval mindset and lay the intellectual foundation for modern psychology—which brings us to our Core Concept for this section:

Six main viewpoints dominate the rapidly changing field of modern psychology—the biological, cognitive, behavioral, whole-person, developmental, and sociocultural perspectives—each of which grew out of radical new concepts about mind and behavior.

core concept

Separation of Mind and Body and the Modern Biological Perspective

The 17th-century philosopher René Descartes *(Day-CART)* proposed the first of these radical new concepts that eventually led to modern psychology. (See Table 1.2.) His idea involved *a distinction between the spiritual mind and the physical body.* The genius of Descartes's insight was that it allowed the Church to keep the mind off limits for scientific inquiry but still allowed the study of human sensations and behaviors because they were based on physical activity in the

TABLE 1.2 The Big Ideas on which Psychology's Six Perspectives Are Based

Perspective	Big Idea	Sources
Biological perspective	The body can be studied separately from the mind.	René Descartes
Cognitive perspective	The methods of science can be used to study the mind.	Wilhelm Wundt
Behavioral perspective	Psychology should be the science of observable behavior—not mental processes.	John Watson
Whole-person perspective	***Psychodynamic psychology:*** Personality and mental disorders arise from processes in the unconscious mind.	Sigmund Freud
	Humanistic psychology: Psychology should emphasize human growth and potential, rather than mental disorder.	Abraham Maslow Carl Rogers
	Trait and temperament psychology: Individuals can be understood in terms of their basic temperaments and enduring personality traits.	Originally from the ancient Greeks
Developmental perspective	People change as the influences of heredity and environment unfold over time.	Many psychologists
Sociocultural perspective	The power of the situation: Social and cultural influences can overpower the influence of all other factors in determining behavior.	Many psychologists

nervous system. His proposal fit well with exciting new discoveries about the biology of nerve circuits in animals, where scientists had just shown how the sense organs convert stimulation into the nerve impulses and muscular responses. Such discoveries, when combined with Descartes' separation of mind and body, allowed scientists, for the first time, to demonstrate that biological processes, rather than mysterious spiritual forces, lay behind sensations and simple reflexive behaviors.

The Modern Biological Perspective The tradition of studying the biological bases of psychological processes, which began with Descartes, can still be seen in the **biological perspective** found in modern psychology. In this view, our personalities, preferences, behavior patterns, and abilities all stem from our physical makeup. Accordingly, biological psychologists search for the causes of our behavior in the nervous system, the endocrine (hormone) system, and the genes. They are also interested in the psychological effects of environmental trauma, such as accidents or disease.

Modern biological psychologists, no longer constrained by the dictates of the medieval Church, have rejoined mind and body (although they leave issues of the soul to religion). Biological psychologists now view the mind as a product of the brain. While they don't deny the value of other perspectives on mind and behavior, biological psychologists see their mission as learning as much as possible about the physical underpinnings of psychological processes.

Biological perspective The psychological perspective that searches for the causes of behavior in the functioning of genes, the brain and nervous system, and the endocrine (hormone) system.

Neuroscience The field devoted to understanding how the brain creates thoughts, feelings, motives, consciousness, memories, and other mental processes.

Two Variations on the Biological Theme As you might imagine, the biological view has strong roots in medicine and biological science. In fact, the emerging field of **neuroscience** combines biological psychology with biology, neurology, and other disciplines interested in brain processes. Thanks to spectacular advances in computers and brain-imaging techniques, neuroscience is a hot area of research. Among their achievements, neuroscientists have begun to unravel the mystery of how our eyes and brain convert light waves into vision. They have also learned how damage to certain parts of the brain can destroy specific abilities, such as speech, social skills, or memory. And, as we will see in Chapter 8,

they have used brain wave patterns to open up the hidden world of sleep and dreams.

Another important variant of biological psychology sprouted recently from ideas proposed by Charles Darwin some 150 years ago. This new **evolutionary psychology** holds that much human behavior arises from inherited tendencies, and it has been given a substantial boost by the recent surge of research in genetics. In the evolutionary view, our genetic makeup—including our most deeply ingrained behaviors—were shaped by the conditions our remote ancestors faced thousands of years ago.

According to evolutionary psychology, environmental forces have pruned the human family tree, favoring the survival and reproduction of individuals with the most adaptive mental and physical characteristics. Darwin called this process *natural selection*. Through it, the physical characteristics of our species have evolved (changed) in the direction of characteristics that gave the fittest organisms a competitive advantage.

Some proponents of evolutionary psychology have made highly controversial claims. In their view, even the most undesirable human behaviors, such as warfare, rape, and infanticide, may have grown out of biological tendencies that once helped humans adapt and survive (Buss, 2008). This approach also proposes controversial biological explanations for certain gender differences—why, for instance, men typically have more sexual partners than do women. More of this controversy will have to wait until our discussion of sexuality in Chapter 9.

The Founding of Scientific Psychology and the Modern Cognitive Perspective

Another radical idea that shaped the early science of psychology came from chemistry, where scientists had noticed patterns in properties of the chemical elements, leading them to develop the famous *periodic table*. At one stroke, the periodic table made the relationships among the elements clear. This revolutionary discovery particularly intrigued one Wilhelm Wundt, a German scientist (who, incidentally, later became the first person to call himself a "psychologist"). Wundt wondered if he could simplify the human psyche in the same way the periodic table had simplified chemistry. (See Table 1.2.) Perhaps he could discover "the elements of conscious experience"! Although Wundt never realized his dream of a periodic table for the mind, he did have this breakthrough insight: *The methods of science could be used to study the mind, as well as the body.*

Introspecting for the Elements of Conscious Experience

"Please press the button as soon as you see the light," Professor Wundt might have said, as he readied to record the *reaction time* between the light stimulus and student's response. Such experiments were common fare in the world's first psychology laboratory where Wundt and his students also performed studies in which trained volunteers described their sensory and emotional responses to various stimuli—a technique called **introspection**— based on an elaborate classification scheme Wundt had devised. There, at the University of Leipzig, in 1879, Wundt and his students began history's first psychology experiments: studies on what they proposed to be "elements" of consciousness, including sensation and perception, memory, attention, emotion, thinking, learning, and language. All our mental activity, they asserted, consists of different combinations of these basic processes.

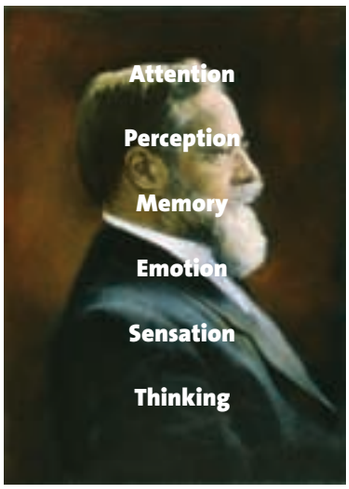
Wundt's Legacy: Structuralism

Wundt's pupil, Edward Bradford Titchener, brought the quest for the elements of consciousness to America, where Titchener began calling it **structuralism.** Titchener's term was fitting, because his goal—like

Evolutionary psychology A relatively new specialty in psychology that sees behavior and mental processes in terms of their genetic adaptations for survival and reproduction.

Introspection The process of reporting on one's own conscious mental experiences.

Structuralism A historical school of psychology devoted to uncovering the basic structures that make up mind and thought. Structuralists sought the "elements" of conscious experience.



E. B. Titchener brought Wundt's quest for the "elements of conscious experience" to America. These elements included the terms you see superimposed on Titchener's image.

In 1879, Wilhelm Wundt (1832–1920) founded the first formal laboratory devoted to experimental psychology. He's shown here (center) in his laboratory in Leipzig in 1912.

that of Wundt—was to reveal the most basic "structures" or components of the mind (Fancher, 1979). So, even though Wundt never used the term, he is considered the "father" of structuralism.

From the outset, both Wundt and Titchener became magnets for critics. Objections especially targeted the introspective method as being too subjective. After all, said the critics, how can we judge the accuracy of people's description of their thoughts and feelings?

But, Wundt and Titchener have had the last laugh. Even though psychologists sometimes view their ideas as quaint, they still rely on updated versions of the old structuralists' methods. For example, you will see introspection at work when we study sleep and dreaming. And you will experience introspection yourself in the upcoming "Do It Yourself!" box. Finally, we can guess that Wundt and Titchener, if they were alive today, would still be laughing for one more reason: The topics that they first identified and explored can be found as chapter headings in every introductory psychology text, including this one.

James and the Function of Mind and Behavior One of Wundt's most vocal critics, the American psychologist William James, argued that the German's approach was far too narrow. (James also said that it was boring—which didn't help his already strained relationship with Wundt.) Psychology should include the *function* of consciousness, not just its *structure,* James argued. Appropriately, his brand of psychology led to a "school"[2] that became known as **functionalism** (Fancher, 1979).

James and his followers found Charles Darwin's ideas far more interesting than Wundt's. Like Darwin, James had a deep interest in emotion that included its relation to the body and behavior (not just as an element of con-

Functionalism A historical school of psychology that believed mental processes could best be understood in terms of their adaptive purpose and function.

[2]The term *school* refers to a group of thinkers who share the same core beliefs.

sciousness, as in Wundt's system). Recurring bouts of depression probably added to his concern with problems and emotions of everyday living (Ross, 1991; Viney, 2006). James also liked Darwin's emphasis on organisms *adapting* to their environments. James therefore proposed that psychology should explain how people adapt—or fail to adapt—to the real world outside the laboratory.

This sort of thinking led the functionalists to become the first *applied* psychologists—interested in how psychology could be used to improve human life. James himself wrote extensively on the development of learned "habits," the psychology of religion, and teaching. Incidentally, he was also probably the first American professor ever to ask for student evaluations (Fancher, 1979). His follower, John Dewey, founded the "progressive education" movement, which emphasized learning by *doing*, rather than by merely listening to lectures and memorizing facts.

Introspection was the point on which structuralism and functionalism agreed. Ironically, their point of agreement was also their greatest point of vulnerability: The introspective method was subjective, leaving them open to the criticism that their versions of psychology were not really scientific. Overcoming this problem took over a half century and the cooperation of experts from several disciplines that came together to form the *cognitive perspective*.

William James spoke of the "stream of consciousness," which portrayed consciousness as an active, ever-changing process. This metaphor, James argued, was much more apt than Wundt's image of consciousness composed of many separate elements.

The Modern Cognitive Perspective The development of the computer—which became the new metaphor for the mind—gave psychology an irresistible push toward a new synthesis: the quest to understand how we perceive our world.

For such demonstrations, the Gestalt psychologists borrowed Wundt's method of introspection, but they objected to his emphasis on the parts, or "elements," of consciousness. Instead, the Gestalt psychologists sought to understand how we construct "perceptual wholes," or *Gestalts.* How do we, for example, form the perception of a face from its component lines, shapes, colors, and textures? Their ultimate goal was even grander: They believed that understanding perception would lead them to an understanding of how the brain creates perceptions. You will get to know the Gestalt psychologists better in Chapter 7, when we take an in-depth look at sensation and perception.

DO IT YOURSELF! A Demonstration from Gestalt Psychology

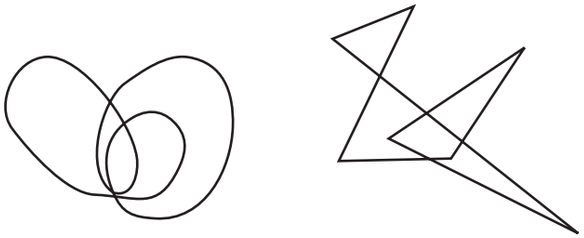


FIGURE 1.5
Takete or Maluma?

Without reading further, decide quickly which one of the two figures above you would name "Takete" and which you would call "Maluma." You might want to see if your friends give the same answer.

According to an early 20th-century group of German psychologists, known as the *Gestalt psychologists,* the names you give to these figures may reflect the associations wired into your brain. Indeed, most people think that the soft-sounding term *Maluma* is more appropriate for the rounded left-hand figure, while the sharp-sounding term *Takete* better fits the pointy figure on the right (Köhler, 1947). This was just one of many simple tests they developed in their

Strict behaviorists, such as B. F. Skinner, believe that psychology should focus on the laws that govern behavior—that is, on the relations between stimuli (S) and responses (R)—rather than on the subjective processes of the mind.

modern **cognitive perspective,** which emphasizes *cognition,* mental activity such as sensation, perception, learning, thinking, and memory. All such activities involve the processing of information, say the cognitive psychologists. From this viewpoint, our thoughts and actions arise when our computer-like brains interpret our experiences and generate responses. For a brief comparison of the cognitive perspective with the other five main psychological perspectives, see Table 1.2.

You might consider cognitive psychologists as heirs to the best of the structuralist, functionalist, and Gestalt traditions. They have appropriated ideas from other sources, as well. From linguistics they took the notion that our most basic language abilities are wired into our brains at birth (Pinker, 2002). From medicine they have borrowed the technology that now allows visualizing the activity of the brain and connecting it to mental processes. And it was from computer science that they borrowed the metaphor of the brain as a biological computer—a processor of information (Gardner, 1985; Gazzaniga, 1998a). Those who are especially interested in the biological underpinnings of mind and behavior are known as *cognitive neuroscientists.*

The Behavioral Perspective: Rejection of Introspection and a Focus on Observable Behavior

Early in the 1900s, a particularly radical and feisty group, known as the *behaviorists,* made a name for themselves by disagreeing with nearly everyone. Most famously, they proposed the idea that the mind should not be a part of psychology at all! John B. Watson, an early leader of the behaviorist movement, argued that a truly objective science of psychology should deal solely with observable events: *stimuli* from the environment and the organism's *responses.* **Behaviorism,** said Watson, should be the science of *behavior* and environmental conditions that influence behavior. (See Table 1.2.)

CONNECTION • CHAPTER 3

John Watson and his colleague Rosalie Rayner performed a notorious experiment in which they taught a young boy, Albert, to fear furry objects.

Behavioral Psychology Loses Its Mind In general, the behaviorists rejected any science of subjective mental processes. And, in particular, they objected to *introspection,* the practice of reporting on mental experiences—a technique that the structuralists, functionalists, and Gestalt psychologists all used. But Watson and his followers cared nothing about what people were thinking or feeling. Instead, they wanted to know how people would *act*—for example, whether a child would recoil from a rabbit that earlier had been paired with a sudden loud noise.

B. F. Skinner, the most influential American behaviorist since Watson, argued that the seductive concept of "mind" has led psychology in circles. The mind, he said, is something so subjective that it cannot even be proved to exist (Skinner, 1990). (Think about it: Can you prove that you have a mind?) As Skinner noted wryly, "The crucial age-old mistake is the belief that . . . what we feel as we behave is the cause of our behaving" (Skinner, 1989, p. 17).

And so, the behaviorists rejected a science of inner experience, choosing instead to study the person entirely from the outside, based only on what they could observe directly: the effects of people, objects, and events on behavior. We can summarize the radical new idea that drove behaviorism this way: *Psychology should be the study of observable behavior and the stimuli that shape behavior.* This **behavioral perspective** called attention especially to the way our actions are modified by their consequences, as when a child is praised for saying, "Thank you." Perhaps the behaviorists' greatest contribution to psychology consists of a detailed understanding of how the environment affects learning. The behaviorists have also given us powerful methods of changing behavior by altering the environment (Alferink, 2005; Roediger, 2004). We will examine all of these ideas more closely in Chapter 3.

Cognitive perspective Another of the main psychological viewpoints distinguished by an emphasis on mental processes, such as learning, memory, perception, and thinking, as forms of information processing.

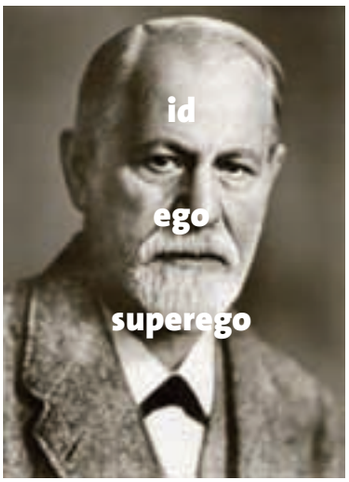
Behaviorism A historical school (as well as a modern perspective) that has sought to make psychology an objective science that focused only on behavior—to the exclusion of mental processes.

Behavioral perspective A psychological viewpoint that finds the source of our actions in environmental stimuli, rather than in inner mental processes.

The Whole-Person Perspectives: Psychodynamic, Humanistic, and Trait and Temperament

At the dawn of the 20th century, another challenge to Wundt and structuralism came from the Viennese physician Sigmund Freud and his disciples, who were developing a method of treating mental disorders based on yet another radical idea: *Personality and mental disorders arise mainly from processes in the unconscious mind, rather than from consciousness*. (See Table 1.2.) Moreover, Freud's *psychoanalytic theory* purported to explain the *whole person,* not just certain components (such as attention, perception, memory, or emotion), as the other schools of psychology had done. His goal was to explain every aspect of mind and behavior in a single, grand theory.

Although Freud was not the first to recognize that we are unaware of some mental processes, neither structuralism nor functionalism nor Gestalt psychology nor behaviorism had imagined that unconscious processes could dominate the personality and cause mental disorders. And Freud's ideas were revolutionary in another respect: None of the earlier "schools" of psychology had proposed a comprehensive method of psychotherapy.



Sigmund Freud taught that the mind had three parts: the unconscious reservoir of energy, needs, and desires (the id), the guardian of morals and values (the superego), and the conscious executive of the personality (the ego).

Psychodynamic Psychology

Freud could be a difficult mentor, provoking many of his followers to break ranks and develop their own theories. We use the term *psychodynamic* to refer to all these *neo-Freudian* formulations that arose from Freud's idea that the mind (psyche), especially the unconscious mind, is a reservoir of energy (dynamics) for the personality. This energy, says **psychodynamic psychology,** is what motivates us. Practitioners specializing in psychotherapy have found such a view especially attractive.

The first and best-known representative of the psychodynamic approach is, of course, Sigmund Freud, whose system is called **psychoanalysis.** Originally conceived as a medical technique for treating mental disorders, psychoanalysts emphasize the analysis of dreams, slips of the tongue (the so-called "Freudian slip"), and a technique called *free association* to gather clues to the unconscious conflicts that are thought to be censored by consciousness. Even today, most psychoanalysts are physicians with a specialty in psychiatry and advanced training in Freudian methods. (And now, as we promised earlier, you know the difference between a *psychologist* and a *psychoanalyst*.)

But Freud and his followers were not the only ones aspiring to explain the whole person. Two other groups shared an interest in a global understanding of the personality, *humanistic psychology* and *trait and temperament psychology.* Here we group all three under the heading of the **whole-person perspectives.**

Humanistic Psychology

Reacting to the psychoanalytic emphasis on sinister forces in the unconscious, **humanistic psychology** took a different tack. The radical new idea developed by the humanistic therapists was *an emphasis on the positive side of our nature that included human ability, growth, and potential.* (See Table 1.2.) In the humanistic view, your self-concept and your physical and emotional needs have a huge influence on your thoughts, emotions, and actions.

Led by the likes of Abraham Maslow and Carl Rogers, humanistic psychologists also rejected what they saw as the cold and mechanical approach of scientific psychology. In its place, they offered a model of human nature emphasizing the free will that people can use to make choices affecting their lives (Kendler, 2005). As you might have suspected, humanistic psychologists have not produced a great deal of scientific research, although their voluminous writings have had a major impact on the practice of counseling and psychotherapy.

Psychodynamic psychology A clinical approach emphasizing the understanding of mental disorders in terms of unconscious needs, desires, memories, and conflicts.

Psychoanalysis An approach to psychology based on Sigmund Freud's assertions, which emphasize unconscious processes. The term is used to refer broadly both to Freud's psychoanalytic theory and to his psychoanalytic treatment method.

Whole-person perspectives A group of psychological perspectives that take a global view of the person: Included are *psychodynamic psychology, humanistic psychology,* and *trait and temperament psychology.*

Humanistic psychology A clinical approach emphasizing human ability, growth, potential, and free will.

Trait and Temperament Psychology The ancient Greeks, who anticipated so many modern ideas, proclaimed that our personalities are ruled by four body *humors* (fluids): blood, phlegm, melancholer, and yellow bile. Depending on which humor was dominant, an individual's personality might be sanguine (dominated by blood), slow and deliberate (phlegm), melancholy (melancholer), or angry and aggressive (yellow bile).

CONNECTION • CHAPTER 10
People's personalities differ on five major trait dimensions, cleverly called the *Big Five.*

We no longer buy into the ancient Greek typology, of course. But their notion of *personality traits* lives on in modern times as **trait and temperament psychology.** The fundamental idea distinguishing this group says: *Differences among people arise from differences in persistent characteristics and dispositions called* traits *and* temperaments. (See Table 1.2.)

You have probably heard of such traits as *introversion* and *extraversion,* which seem to be fundamental characteristics of human nature. Other traits that psychologists have identified in people all over the world include a sense of anxiety or well-being, openness to new experiences, agreeableness, and conscientiousness. We will examine these "Big Five" personality traits more closely in Chapter 10. Some psychologists also propose that we differ on an even more fundamental level called *temperament,* thought to account for the different dispositions observed among newborn babies (and among adults, as well).

The Developmental Perspective: Changes Arising from Nature and Nurture

Change may be the only constant in our lives. According to the **developmental perspective,** psychological change results from an interaction between the *heredity* written in our genes and the influence of our *environment*. (See Table 1.2.) A big question mark, however, stands over the relative contributions made by these two forces. So, developmental psychologists ask: Which counts most heavily, *nature* or *nurture* (heredity or environment) in shaping who we become? As you might expect, biological psychologists emphasize *nature,* while behaviorists emphasize *nurture*. But developmental psychology is where the two forces come together.

The big idea that defines the developmental perspective is this: *People change in predictable ways as the influences of heredity and environment unfold over time*. In other words, humans think and act differently at different times of their lives. Physically, development can be seen in such predictable processes as growth, puberty, and menopause. And psychologically, development can be observed in the acquisition of language, logical thinking, and the assumption of different roles at different times of life.

In the past, much of the developmental research has focused on children—in part because they change so rapidly and in rather predictable ways. More recently, however, developmental psychologists have increasingly turned their attention to teens and adults—showing that developmental processes continue throughout our lives. In Chapter 6, we will explore the common patterns of psychological change seen across the entire lifespan, from before birth to old age. The developmental theme will appear elsewhere throughout this text, too, because development affects all our psychological processes, from biology to social interaction.

Trait and temperament psychology
A psychological perspective that views behavior and personality as the products of enduring psychological characteristics.

Developmental perspective One of the six main psychological viewpoints, distinguished by its emphasis on nature and nurture and on predictable changes that occur across the lifespan.

Sociocultural perspective A main psychological viewpoint emphasizing the importance of social interaction, social learning, and a cultural perspective.

The Sociocultural Perspective: The Individual in Context

Who could deny that people exert powerful influences on each other? The **sociocultural perspective** places the idea of *social influence* center stage. From this viewpoint, *social psychologists* have long probed the mysteries of liking, lov-

ing, prejudice, aggression, obedience, and conformity. And more recently, many have become interested in how these social processes vary from one *culture* to another. (See Table 1.2.)

Culture, a complex blend of human language, beliefs, customs, values, and traditions, exerts profound influences on all of us. We can see culture in action by comparing people, for example, in the California–Mexican culture of San Diego and the Scandinavian-based culture of Minnesota. Psychology's earlier blindness to culture was due, in part, to the beginnings of scientific psychology in Europe and North America, where most psychologists lived and worked under similar cultural conditions (Lonner & Malpass, 1994; Segall et al., 1998). But now the perspective has broadened. Although nearly half of the world's half-million psychologists still live and work in the United States, it is encouraging to note that interest in psychology is also growing in countries outside of Europe and North America (Pawlik & d'Ydewalle, 1996; Rosenzweig, 1992, 1999). Even so, most of our psychological knowledge still has a North American/European flavor. Recognizing this bias, **cross-cultural psychologists** have begun the long task of reexamining the "laws" of psychology across cultural and ethnic boundaries (Cole, 2006).

Proponents of the sociocultural view, of course, do not deny the effects of heredity or learning or even of unconscious processes. Rather they bring to psychology a powerful additional concept: *the power of the situation.* From this viewpoint, then, *the social and cultural situation in which the person is embedded can overpower all other factors that influence behavior.*

To summarize the perspectives we have just covered, please have a look at Figure 1.6. There you will find a thumbnail overview of the main viewpoints that make up the spectrum of modern psychology. A few moments taken to fix these perspectives in your mind will pay big dividends in your understanding of the chapters that follow, where we will refer to them often, as we shift from one perspective to another.

Dr. Phil Zimbardo, one of your authors, is a social psychologist who studies the "power of the situation" in controlling our behavior. You will see how strongly social situations affect our behavior when you read about his Stanford Prison Experiment in Chapter 11.

Culture A complex blend of language, beliefs, customs, values, and traditions developed by a group of people and shared with others in the same environment.

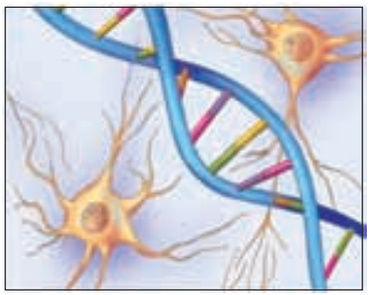
Cross-cultural psychologists Those who work in this specialty are interested in how psychological processes may differ among people of different cultures.

The Changing Face of Psychology

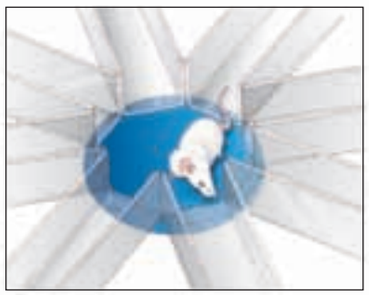
Modern psychology is a field in flux. Over the last several decades, the biological, cognitive, and developmental perspectives have become dominant. And increasingly, adherents of once-conflicting perspectives are making connections and joining forces. So we now see such new and strange hybrid psychologists as "cognitive behaviorists" or "evolutionary developmentalists." At the same time, nearly all specialties within psychology seem eager to make a connection with neuroscience, which is rapidly becoming one of the pillars of the field. Yet another trend has appeared among psychologists taking a sociocultural perspective: Those who put the emphasis on culture are gaining ascendancy. Meanwhile, the Freudian camp seems to be losing ground among those holding a whole-person perspective.

We also call your attention to an especially noteworthy shift in the proportion of psychologists who are women and members of minority groups. Ethnic minorities—especially Asians, African Americans, and Latinos—are becoming psychologists in increasing numbers (Kohout, 2001). Even more striking is the new majority status of women in psychology. In 1906, only 12% of American psychologists listed were women, according to a listing in *American Men of Science* (named with no irony intended). By 1921 the proportion had risen above 20%. And now, women receive more than two-thirds of the new doctorates awarded in the field each year (Cynkar, 2007; Kohout, 2001).

Cross-cultural psychologists, such as this researcher in Kenya, furnish important data for checking the validity of psychological knowledge.



The Biological Perspective focuses on:
- nervous system
- endocrine system
- genetics
- physical characteristics



The Behavioral Perspective focuses on:
- learning
- control of behavior by the environment
- stimuli and responses—but not mental processes

The Developmental Perspective focuses on:
- changes in psychological functioning across the life span
- heredity and environment

The Cognitive Perspective focuses on:
- mental processes, such as thought, learning, memory, and perception
- the mind as a computer-like "machine"
- how emotion and motivation influence thought and perception ("hot cognition")

The Whole-Person Perspective includes:
- the *Psychodynamic view*, which emphasizes unconscious motivation and mental disorder
- the *Humanistic view*, which emphasizes mental health and human potential
- the *Trait and Temperament view*, which emphasizes personality characteristics and individual differences

The Sociocultural Perspective focuses on:
- social influences on behavior and mental processes
- how individuals function in groups
- cultural differences

FIGURE 1.6
Summary of Psychology's Six Main Perspectives

Although psychology has always included a higher proportion of women than any of the other sciences, women have too often found gender biases blocking their career paths (Furumoto & Scarborough, 1986). For example, G. Stanley Hall, one of the pioneers of American psychology, notoriously asserted that academic work would ruin a woman's health and cause deterioration of her reproductive organs. Nevertheless, as early as 1905 the American Psychological Association elected its first female president, Mary Whiton Calkins.

CONNECTION • CHAPTER 10
The opening vignette in the "Personality" chapter gives more detail about Mary Calkins's life.

Ironically, Calkins had earlier been denied a doctorate by Harvard University because of her sex even though she had completed all the requirements. In those early days of psychology, as in all fields of science, women were pressured to choose between marriage and career; those who managed to have a career were usually limited to less prestigious positions at women's colleges. Still, they made important contributions to their developing field, as you can see in a sampling presented in Table 1.3.

TABLE 1.3 Early Contributions Made by Women in Psychology

	Research Area	Institutional Affiliation
Mary Calkins	Memory, psychology of the self	Wellesley College
Christine Ladd Franklin	Logic and color vision	Johns Hopkins University
Kate Gordon	Memory and attention	Mount Holyoke, Carnegie Tech
Julia Gulliver	Dreams and the subconscious self	Rockford University
Alice Hinman	Attention and distraction	University of Nebraska
Lillien Martin	Psychophysics	Wellesley College
Anna McKeag	Pain	Bardwell School
Naomi Norsworthy	Abilities of the child	Columbia Teachers College
Millicent Shinn	Child development	Unaffiliated
Helen Thompson	Mental traits	Mount Holyoke College
Margaret Washburn	Perception	Vassar College
Mabel Williams	Visual illusions	Unaffiliated

Source: The 1906 edition of *American Men of Science.*

DO IT YOURSELF! An Introspective Look at the Necker Cube

The cube in Figure 1.7A will trick your eye—or, more accurately, it will trick your brain. Look at the cube for a few moments, and suddenly it will seem to change perspectives. For a time it may seem as if you were viewing the cube from the upper right (Figure 1.7B). Then, abruptly, it will shift and appear as though you were seeing it from the lower left (Figure 1.7C).

It may take a little time for the cube to shift the first time. But, once you see it change, you won't be able to prevent it from alternating back and forth, seemingly at random. Try showing the cube to a few friends and asking them what they see. Do they see it shifting perspectives, as you do?

This phenomenon was not discovered by a psychologist. Rather, Louis Necker, a Swiss geologist, first noticed it nearly 200 years ago while looking at cube-shaped crystals under a microscope. Necker's amazing cube illustrates two important points.

First, it illustrates the much-maligned process of *introspection,* pioneered by Wundt and his students. You will note that the only way we can demonstrate that the Necker cube changes perspectives in our minds is by introspection: having people look at the cube and report what they see. And why is this important to psychology? Only the hardest of the hard-core behaviorists would deny that something happens mentally within a person looking at the cube. Moreover, as the Gestalt psychologists noted, this shifting perspective obviously involves more than seeing lines on a page. In fact, the Necker cube demonstrates that we add meaning to our sensations—a process called *perception,* which will be a main focus of a later chapter.

The second important point is this: The Necker cube can serve as a metaphor for the multiple perspectives in psychology. Just as there is no single right way to see the cube, there is no single perspective in psychology that gives us the whole "truth" about behavior and mental processes. Put another way, if we are to understand psychology fully, we must alternately shift our viewpoints among multiple perspectives.

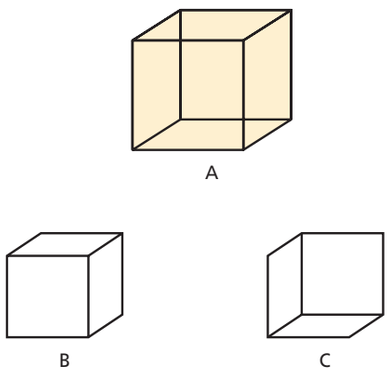


FIGURE 1.7
Different Perspectives of the Necker Cube

Necker cube An ambiguous two-dimensional figure of a cube that can be seen from different perspectives: The Necker cube is used here to illustrate the notion that there is no single "right way" to view psychological processes.

PSYCHOLOGYMATTERS:

Psychology as a Major

Becoming a fully fledged psychologist requires substantial training beyond the bachelor's degree. In graduate school, the psychology student takes advanced classes in one or more specialized areas while developing general skills as a scholar and researcher. On completion of the program, the student receives a master's or doctor's degree, typically a PhD (Doctor of Philosophy), an EdD (Doctor of Education), or a PsyD (Doctor of Psychology).

Satisfying careers are available, however, at various levels of education in psychology, although by far the best choices are available to holders of a doctorate (Smith, 2002b). In most states, a license to practice psychology requires a doctorate, plus a supervised internship. Most college and university teaching or research jobs in psychology also require a doctorate.

A master's degree, typically requiring two years of study beyond the bachelor's level, may qualify you for employment as a psychology instructor at the high school level or as an applied psychologist in certain specialties, such as counseling. Master's-level psychologists are common in human service agencies, as well as in private practice (although many states do not allow them to advertise themselves as "psychologists").

Holders of associate's degrees and bachelor's degrees in psychology or related human services fields may find jobs as psychological aides and technicians in agencies, hospitals, nursing homes, and rehabilitation centers. If this is your goal, however, you should know that salaries at this level are relatively low (Kohout, 2000). A bachelor's degree in psychology, coupled with training in business or education, can also lead to interesting careers in personnel management or education.

If you would like further information about job prospects and salary levels for psychologists, search the U.S. Department of Labor's *Occupational Outlook Handbook* (2008–2009 edition). You can find it on the Web at www.bls.gov/oco/home.htm.

CheckYourUnderstanding

1. **RECALL:** René Descartes made a science of psychology possible when he suggested that _____.
2. **APPLICATION:** "The differences between men and women are mainly the result of different survival and reproduction issues faced by the two sexes." Which of the main viewpoints in psychology would this statement represent?
3. **RECALL:** Which of the early schools of psychology is most closely associated with developing the method of *introspection?*
4. **APPLICATION:** If you were a teacher trying to understand how students learn, which of the following perspectives would be most helpful?
   a. the cognitive view
   b. the psychodynamic view
   c. structuralism
   d. the trait and temperament view
5. **RECALL:** To which of the structuralists' and functionalists' ideas did the behaviorists object?
6. **RECALL:** Which of the "whole-person" views focuses on understanding the unconscious mind?
7. **APPLICATION:** "Soldiers may sometimes perform heroic acts, not so much because they have heroic personality traits but because they are in a *situation* that encourages heroic behavior." Which perspective is this observation most consistent with?
8. **APPLICATION:** If you wanted to tell whether a friend had experienced a perceptual shift while viewing the Necker cube, you would have to use the method of _____, which was pioneered by Wundt and the structuralists.
9. **UNDERSTANDING THE CORE CONCEPT:** Which of the following sets of factors is all associated with the perspective indicated?
   a. memory, personality, environment: the behavioral perspective
   b. mental health, mental disorder, mental imagery: the trait and temperament perspective
   c. heredity, environment, predictable changes throughout the lifespan: the developmental perspective
   d. neuroscience, evolutionary psychology, genetics: the cognitive perspective

Answers **1** Descartes declared that sensations and behaviors are the result of activity in the nervous system. **2** the biological perspective—in particular the viewpoint of evolutionary psychology **3** structuralism **4** a **5** They partiicularly objected to the concept of the *mind* as an object of scientific study. They also objected to introspection as a subjective, and therefore unscientific, method. **6** the psychodynamic view, especially psychoanalysis **7** the sociocultural perspective **8** introspection **9** c

Critical Thinking Applied: Facilitated Communication

Autism is a developmental disorder that can cause severe impairments in attention, cognition (thinking and related mental processes), communication, and social functioning. In the most extreme forms, persons with autism often seem encapsulated in their own worlds, disconnected from people around them. Consequently, the psychological resources they require can impose a heavy burden on parents and teachers. It is no wonder, then, that a technique known as "facilitated communication" was heralded as a dramatic "breakthrough" when it was touted as a means of communicating with individuals who have *autism*.

What Is the Issue?

Here's how facilitated communication was said to work: A *facilitator* attempts to help the person with autism converse by helping him or her answer questions by pointing to letters on a letter board or keyboard. (You can see how this is done in the accompanying photo.) The technique rests on the unfounded belief that untapped language abilities lie hidden by the mask of autism. You may have already identified the problem with this method: How can we be sure that the individual, rather than the facilitator, is the one responding?

Parents and teachers enthusiastically received the initial reports on facilitated communication. But many psychologists remained skeptical. The real issue, they said, was this: Can we find evidence to show that this method really works—or not? They pointed out that testimonials are not acceptable scientific evidence. They also suggested that the helper might be consciously or unconsciously guiding the child's hand to produce the messages.

When skeptical psychologists tested the claims for facilitated communication, they found that it wasn't the autistic children who were responsible for the messages.

What Critical Thinking Questions Should We Ask?

On its face, the claim that a person with autism is, somehow, ready but unable to communicate—and that this simple pointing technique could break through the barrier of autism—sounded too good to be true. Such extreme claims should be a cue for critical thinkers to ask two other questions. First, "Is there a possibility of bias?"—perhaps because the facilitators and the parents want so much to find an effective therapy for this disorder. Second, then, is the critical thinking question, "What is the evidence?"

Sure enough, evidence in the form of scientific studies showed that, when the facilitator knew the questions, the child with autism would seem to give sensible answers. But when "blinders" were applied—by hiding the questions from the facilitator—the responses were inaccurate or nonsensical (American Psychological Association, 2003; Lilienfeld, 2007).

Sadly, although facilitated communication had extended hope to beleaguered parents and teachers, a scientific look presented a picture showing how uncritical belief could lead to consequences far worse than false hopes. Not only were more effective treatments delayed, but parents blamed themselves when their children did not respond to the treatment as expected (Levine et al., 1994). Worst of all were the false accusations of sexual abuse based on messages thought to have come from children with autism (Bicklen, 1990; Heckler, 1994). The research left little doubt, however, that these messages had originated wholly in the minds of the facilitators. In light of such findings, the American Psychological Association (2003b) denounced facilitated communication as a failure and relegated it to the junk pile of ineffective therapies.

What Conclusions Can We Draw?

So, what lessons about critical thinking can you, as a student of psychology, take away from the facilitated communication fiasco? After all, you won't be able to run your own scientific test on every fantastic-sounding claim that comes along. We hope that it will help instill a skeptical attitude about reports of extraordinary new treatments, dramatic psychological "breakthroughs," and products that claim to help you develop "untapped potential." And, we hope you will

always pause to ask: What is the evidence? Is there another possible explanation? Has someone done a controlled test? Could the claims be merely the result of people's expectations—that is, of *expectancy bias?* Confirmation bias and emotional biases were undoubtedly at work, too: Parents and teachers desperate for an effective treatment uncritically grabbed onto the anecdotal reports of success. Perhaps this summarizes the big lesson to be learned: No matter how much you want to believe, and no matter how many anecdotes and testimonials you have, none of it ever adds up to real evidence.

Chapter Summary

1.1 What Is Psychology—And What Is It *Not?*

Core Concept 1.1: Psychology is a broad field, with many specialties, but fundamentally psychology is the science of behavior and mental processes.

All psychologists are concerned with some aspect of behavior and mental processes. Unlike the pseudosciences, scientific **psychology** demands solid evidence to back up its claims. Within psychology there are many specialties that fall within three broad areas. **Experimental psychologists** primarily do research, but they often teach as well. Those who are primarily **teachers of psychology** work in a variety of settings, including colleges, universities, and high schools. **Applied psychologists** practice many specialties, such as engineering, school, rehabilitation psychology, clinical psychology, and counseling. In contrast with psychology, **psychiatry** is a medical specialty that deals with mental disorder.

In the media, much of what appears to be psychology is actually **pseudopsychology.** Telling the difference requires development of **critical thinking skills**—which this book organizes around the following questions that should be asked when confronting new claims that purport to be scientifically based:

- What is the source?
- Is the claim reasonable or extreme?
- What is the evidence?
- Could bias contaminate the conclusion?
- Does the reasoning avoid common fallacies?
- Does the issue require multiple perspectives?

Unchecked, pseudopsychology can have harmful effects, as seen in the use of the "lobotomy" and the "lie detector." People are attracted to pseudopsychology for many reasons, but one of the most important is **confirmation bias,** which can also blind them to more credible alternatives.

Applied psychologists (p. 5)
Confirmation bias (p. 8)
Critical thinking skills (p. 7)
Emotional bias (p. 8)
Experimental psychologists (p. 5)
Pseudopsychology (p. 7)
Psychiatry (p. 6)
Psychology (p. 4)
Teachers of psychology (p. 5)

MyPsychLab Resources 1.1:

Watch: Cultural Biases: Robert Guthrie

Explore: How to Be a Critical Thinker

1.2 How Do Psychologists Develop New Knowledge?

Core Concept 1.2: Psychologists, like all other scientists, use the scientific method to test their ideas empirically.

Psychology differs from the pseudosciences, such as astrology, in that it employs the scientific method to check its ideas empirically—based on direct observations. The **scientific method** consists of five steps: (1) developing a hypothesis, (2) performing a controlled test, (3) gathering objective data, (4) analyzing the results and accepting or rejecting the **hypothesis**, and (5) publishing, criticizing, and replicating the results. Variations on this scientific method include **experiments, correlational studies,** and several kinds of

descriptive research, such as **surveys, naturalistic observations,** and **case studies.** Each differs in the amount of control the researcher has over the conditions being investigated. Everyone, including the scientist, has biases. Researchers can fall prey to **personal bias** and **expectancy bias.** One way that scientists control for bias in their studies involves the double-blind control method. Using the experimental method in large and well-controlled double-blind studies, researchers have failed to find evidence that links sugar to hyperactivity in children.

Psychologists must conduct their work by following a code of ethics, established by the American Psychological Association, for the humane treatment of subjects. Still, some areas of disagreement remain. These especially involve the use of deception and the use of animals as experimental subjects. And, despite the power of science to help us learn about the natural world, there are many important nonscientific questions that science simply cannot answer.

Case study (p. 18)
Control group (p. 13)
Correlational study (p. 16)
Data (p. 14)
Dependent variable (p. 14)
Double-blind study (p. 19)
Empirical investigation (p. 11)
Expectancy bias (p. 18)
Experiment (p. 16)
Experimental group (p. 13)
Hypothesis (p. 12)
Independent variable (p. 13)
Naturalistic observation (p. 17)
Negative correlation (p. 17)
Operational definitions (p. 12)
Placebo (p. 19)
Positive correlation (p. 16)
Random assignment (p. 14)
Replicate (p. 15)
Scientific method (p. 11)
Survey (p. 17)
Theory (p. 11)

MyPsychLab Resources 1.2:

Simulation: Distinguishing Independent and Dependent Variables
Simulation: Ethics in Psychological Research
Watch: The Complexity of Humans: Phil Zimbardo

1.3 What Are Psychology's Main Perspectives?

Core Concept 1.3: Six main viewpoints dominate the rapidly changing field of modern psychology—the biological, cognitive, behavioral, whole-person, developmental, and social-cultural perspectives—each of which grew out of radical new concepts about mind and behavior.

Psychology has its roots in several sometimes-conflicting traditions stretching back to the ancient Greeks. René Descartes helped the study of the mind to become scientific, based on his assertion that sensations and behaviors are linked to activity in the nervous system—a step that ultimately led to the modern **biological perspective**, which looks for the causes of behavior in physical processes such as brain function and genetics. Biological psychology itself has developed in two directions: the emerging fields of **neuroscience** and **evolutionary psychology.**

The formal beginning of psychology as a science, however, is traced to the establishment by Wundt of the first psychological laboratory in 1879. Wundt's psychology, which American psychologists morphed into **structuralism,** advocated understanding mental processes such as consciousness by investigating their contents and structure. Another early school of psychology, known as **functionalism,** argued that mental processes are best understood in terms of their adaptive purposes and functions. Also in opposition to structuralism, Gestalt psychology focused on perceptual "wholes," rather than parts of consciousness. Each of them was criticized for the use of **introspection,** which some psychologists found too subjective. Nevertheless, elements of these three "schools" can be found in the modern **cognitive perspective,** with its interest in learning, memory, sensation, perception, language, and thinking and its emphasis on information processing.

The **behavioral perspective** emerged around 1900, rejecting the introspective method and mentalistic explanations, choosing instead to analyze behavior in terms of observable stimuli and responses. Proponents of **behaviorism,** such as John Watson and B. F. Skinner, have exerted a powerful influence on modern psychology, with their emphasis on objective methods, insights into the nature of learning, and effective techniques for the management of undesirable behavior.

Three rather different viewpoints make up the **whole-person perspectives,** which all take a global view of the individual. Sigmund Freud's psychoanalytic approach, with its emphasis on mental disorder and unconscious processes, led to **psychoanalysis** and modern **psychodynamic psychology.** In contrast, **humanistic psychology,** led by Abraham Maslow and Carl Rogers, have emphasized the positive side of human nature. Meanwhile, **trait and temperament psychology** sees people in terms of their persistent characteristics and dispositions.

The **developmental perspective** calls attention to mental and behavioral changes that occur predictably throughout the lifespan. Such changes result from the interaction of heredity and environment. Likewise, the **sociocultural perspective** calls attention to the fact that each individual is influenced by other people and by the culture in which they are all embedded.

Modern psychology has changed rapidly over the past decades, as the biological, cognitive and develop-

mental perspectives have become dominant. At the same time, adherents of different perspectives are joining forces. Another major change involves the increasing number of women and minority-group members entering the field.

While careers in psychology are available at various educational levels, becoming a fully fledged psychologist requires a doctorate. Those with less than a doctorate may find work in various applied specialties as aides, teachers, and counselors, although salaries are usually low.

Behavioral perspective (p. 28)
Behaviorism (p. 28)
Biological perspective (p. 24)
Cognitive perspective (p. 28)
Cross-cultural psychologists (p. 31)
Culture (p. 31)
Developmental perspective (p. 30)
Evolutionary psychology (p. 25)
Functionalism (p. 26)
Humanistic psychology (p. 29)
Introspection (p. 25)
Necker cube (p. 33)
Neuroscience (p. 24)
Psychoanalysis (p. 29)
Psychodynamic psychology (p. 29)
Sociocultural perspective (p. 30)
Structuralism (p. 25)
Trait and temperament psychology (p. 30)
Whole-person perspectives (p. 29)

MyPsychLab Resources 1.3:

Explore: Diversity in Psychological Inquiry
Watch: Even the Rat was White: Robert Guthrie
Watch: Women and the Field of Pychology: Florence Denmark

The Six Modern Perspectives in Psychology

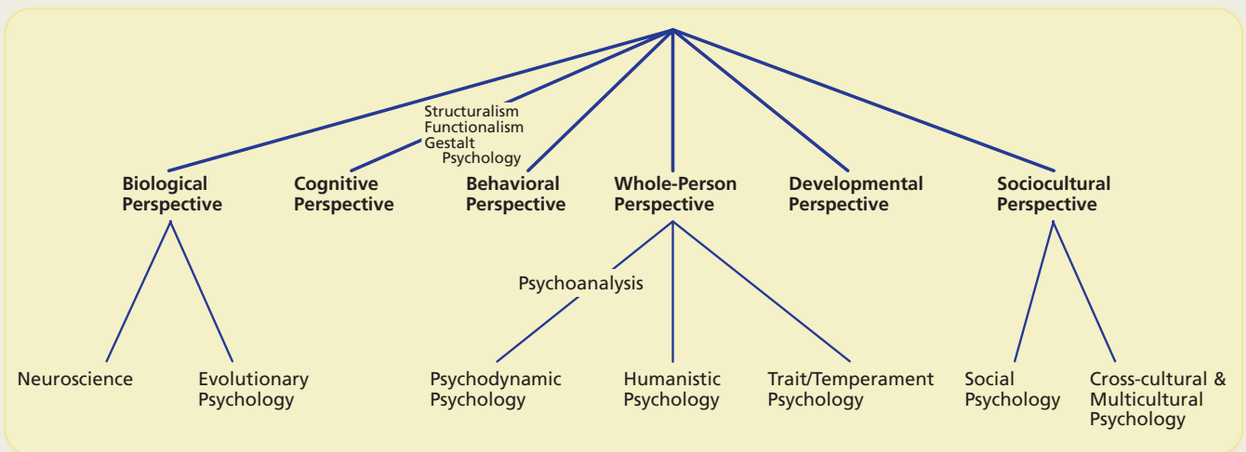


FIGURE 1.8
The Six Modern Perspectives in Psychology

Discovering Psychology Viewing Guide

Watch the following videos by logging into MyPsychLab (www.mypsychlab.com). After you have watched the videos, complete the activities that follow.

PROGRAM 1: PAST, PRESENT, AND PROMISE

PROGRAM 2: UNDERSTANDING RESEARCH

PROGRAM REVIEW

1. What is the best definition of psychology?
   a. the scientific study of how people interact in social groups
   b. the philosophy explaining the relation between brain and mind
   c. the scientific study of the behavior of individuals and of their mental processes
   d. the knowledge used to predict how virtually any organism will behave under specified conditions
2. As scientists, psychologists do which of the following?
   a. develop methods of inquiry that are fundamentally at odds with those of physics and chemistry
   b. test their theories under carefully controlled experimental circumstances
   c. ignore their own observational biases when collecting data
   d. rely completely on introspective techniques
3. What is the main goal of psychological research?
   a. to cure mental illness
   b. to find the biological bases of the behavior of organisms
   c. to predict and, in some cases, control behavior
   d. to provide valid legal testimony
4. Who founded the first psychology laboratory in the United States?
   a. Wilhelm Wundt
   b. William James
   c. G. Stanley Hall
   d. Sigmund Freud
5. Which of the following psychologists was the first to study people's sensory processing, judgment, attention, and word associations?
   a. G. Stanley Hall
   b. William James
   c. Wilhelm Wundt
   d. Sigmund Freud
6. Which of the following is desirable in research?
   a. having the control and experimental conditions differ on several variables
   b. interpreting correlation as implying causality
   c. systematic manipulation of the variable(s) of interest
   d. using samples of participants who are more capable than the population you want to draw conclusions about
7. What is the main reason the results of research studies are published?
   a. so researchers can prove they earned their money
   b. so other researchers can try to replicate the work
   c. so the general public can understand the importance of spending money on research
   d. so attempts at fraud and trickery are detected
8. Why does the placebo effect work?
   a. because researchers believe it does
   b. because participants believe in the power of the placebo
   c. because human beings prefer feeling they are in control
   d. because it is part of the scientific method
9. What is the purpose of a double-blind procedure?
   a. to test more than one variable at a time
   b. to repeat the results of previously published work
   c. to define a hypothesis clearly before it is tested
   d. to eliminate experimenter bias
10. A prediction of how two or more variables are likely to be related is called a
    a. theory.
    b. conclusion.
    c. hypothesis.
    d. correlation.

11. Imagine a friend tells you that she has been doing better in school since she started taking vitamin pills. When you express disbelief, she urges you to take vitamins too. Why might the pills "work" for her but not necessarily for you?
    a. Healthy people don't need vitamins.
    b. A belief in the power of the vitamins is necessary for any effect to occur.
    c. She is lying.
    d. They would work for her and not for you if she was a poor student and you were a straight-A student.
12. In which experiment would a double-blind test be most appropriate?
    a. a lab experiment by a technician who does not understand the theory under scrutiny
    b. a study designed to test the researcher's own controversial theory
    c. a survey asking subjects how many siblings they have
    d. an experiment on the effect of a drug on maze running ability in rats
13. Why would other scientists want to replicate an experiment that has already been done?
    a. to have their names associated with a well-known phenomenon
    b. to gain a high-odds, low-risk publication
    c. to ensure that the phenomenon under study is real and reliable
    d. to calibrate their equipment with those of another laboratory
14. What is the main focus of Donchin's research involving the P-300 wave?
    a. the relation between brain and mind
    b. the role of heredity in shaping personality
    c. the development of mental illness
    d. the role of situational factors in perception
15. The reactions of the boys and the girls to the teacher in the *Candid Camera* episode were essentially similar. Professor Zimbardo attributes this reaction to
    a. how easily adolescents become embarrassed.
    b. how an attractive teacher violates expectations.
    c. the way sexual titillation makes people act.
    d. the need people have to hide their real reactions.
16. Which cluster of topics did William James consider the main concerns of psychology?
    a. reaction times, sensory stimuli, word associations
    b. consciousness, self, emotions
    c. conditioned responses, psychophysics
    d. experimental design, computer models
17. The amygdala is an area of the brain that processes
    a. sound.
    b. social status.
    c. faces.
    d. emotion.
18. How did Wundtian psychologists, such as Hall, react to William James's concept of psychology?
    a. They accepted it with minor reservations.
    b. They expanded it to include consciousness and the self.
    c. They rejected it as unscientific.
    d. They revised it to include the thinking of Sigmund Freud.
19. Who wrote *Principles of Psychology* and thereby became arguably the most influential psychologist of the last century?
    a. G. Stanley Hall
    b. Wilhelm Wundt
    c. William James
    d. Sigmund Freud
20. What assumption underlies the use of reaction times to study prejudice indirectly?
    a. People of different ethnic backgrounds are quicker intellectually than people of other ethnicities.
    b. Concepts that are associated more strongly in memory are verified more quickly.
    c. Prejudice can't be studied in any other way.
    d. People respond to emotional memories more slowly than emotionless memories.

QUESTIONS TO CONSIDER

1. Although psychologists are involved in many different kinds of research and professional activities, there are certain fundamental issues that form the basic foundation of psychology. What are they?
2. Why would the study of normal behavior be more important to the science of psychology than an understanding of abnormal behavior?
3. How do your culture, age, gender, education level, and past experience bias your observations about events, your own actions, and the behavior of others?
4. Imagine the year 2500. How do you think the boundaries of psychological and biological research

might have become redefined by then? Do you think the two fields will have become more integrated or more distinct?

5. What is your reaction to the guidelines prohibiting research if it would require deception and if distress is a likely result? Are there studies you think would be valuable to perform but that could not be? Could the same research questions be answered in some other way?

ACTIVITIES

1. Start a personal journal or a log. Make a daily practice of recording events, thoughts, feelings, observations, and questions that catch your attention each day. Include the ordinary and the unusual. Then speculate on the possible forces causing your behavior. As you progress through the course, review your notes and see how your observations and questions reflect what you have learned.
2. As you go through your day-to-day life, watching the news, battling traffic, and making decisions about how to spend your time and money, consider all the ways that psychologists might be interested in studying, facilitating, or intervening in human behavior.
3. Design an experiment that would allow you to show whether a two-week-old child knows who her mother is. Be sure your experimental design can eliminate alternative explanations for your data.