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

Modern psychology developed from several conflicting traditions, including structuralism, functionalism, Gestalt psychology, behaviorism, and psychoanalysis.

Seven main perspectives characterize modern psychology: the biological, developmental, cognitive, clinical, behavioral, trait, and sociocultural views.

Psychologists, like researchers in all other sciences, use the scientific method to test their ideas empirically.

Knowing the Difference between a Psychologist and a Psychiatrist
Psychologists are not always therapists—nor are they physicians.

An Introspective Look at the Necker Cube
This famous figure changes only in your mind.

Psychology as a Major
To call yourself a psychologist, you’ll need graduate training.

Getting in Deeper
Whatever your major, consider getting a student membership in a professional organization and starting to read some of the journals.

USING PSYCHOLOGY TO LEARN PSYCHOLOGY:
Studying with Key Questions and Core Concepts

For further exploration of the concepts presented in this chapter, watch the following Discovering Psychology video programs in MyPsychLab and use the Viewing Guide at the end of this chapter. MyPsychLab can be accessed at www.mypsychlab.com.

Program 1: Past, Present, and Promise
Program 1 introduces psychology as the scientific study of behavior and mental processes. It looks at how psychologists work from a variety of theoretical models and traditions, record and analyze their observations, and attempt to unravel the mysteries of the mind.

Program 2: Understanding Research
Program 2 demonstrates the hows and whys of psychological research. By showing how psychologists rely on systematic observation, data collection, and analysis to find out the answers to their questions, this program reveals why the scientific method is used in all areas of empirical investigation.
People referred to him as Clever Hans because, to all appearances, he was exceptionally smart. But another characteristic made his case truly remarkable: Hans was a horse. His celebrity grew from public demonstrations in which he apparently solved math problems. “What is 12 plus 7?” a bystander might ask, and Hans would tap 19 times with his hoof. He wasn’t always right, mind you, but most of the time Hans gave correct answers to problems involving simple addition, subtraction, multiplication, and division—even square roots. Nor were his presumed talents limited to math: When presented with questions written on large cards, Hans would spell out answers by tapping the ground to indicate letters on an alphabet board.

As Hans’s fame spread throughout Europe and America, he became the world’s most famous animal. But the scientific community, as you might expect, had its skeptics. Could a horse think and reason? Surely not. But then, how could they explain Hans’s apparent talents?

One fall day in 1904, a committee of scientists, assembled by Carl Stumpf, Director of the Berlin Psychological Institute, paid a visit to Hans’s owner, Wilhelm von Osten to investigate the matter. The group brought a variety of backgrounds to the task, including psychology, zoology, and veterinary medicine. For good measure, Stumpf also brought along a circus animal trainer and a prominent politician. For his part, Mr. Von Osten obligingly put Hans through his intellectual paces, while the committee
observed. Their initial skepticism soon gave way to fascination at the horse’s performance. More important for the committee’s mission, they found no hint that von Osten was cheating.

Nevertheless, one of the committee members, psychologist Oskar Pfungst, remained suspicious. He wondered whether the horse might be responding to cues unconsciously given by von Osten. Dr. Pfungst, therefore, proposed a more controlled test of Hans’s abilities. Could the horse correctly answer questions when its owner Osten did not know the answer or was out of sight? Sure enough, when von Osten was not allowed to see the written questions, Hans failed the test. Likewise, when von Osten could see the questions but was required to stand behind a curtain or otherwise outside the horse’s field of vision, Hans could not answer.

Von Osten was deeply disappointed with the results. But, to his credit, he cooperated with Pfungst to find out exactly what sorts of cues the horse had been sensing. A slight lean forward served as the signal for Hans to start tapping. The “stop” sign could be a subtle straightening of von Osten’s posture, a rise of his eyebrows, or even a flaring of his nostrils. Hans, it turned out, was a clever horse, indeed—clever at reading almost imperceptible physical cues. When it came to verbal and math skills, however, his abilities were just average . . . for a horse.

**WHAT IS PSYCHOLOGY—AND WHAT IS IT NOT?**

In a generic sense, everyone is a psychologist. We all study people, analyze their behavior, try to understand what they are thinking and feeling, and attempt to predict what they will do next. But there is a real difference between the commonsense psychology your Uncle Felix or Aunt Ethyl uses in everyday life and the psychology you will learn about in the following pages. We have already glimpsed the latter in Dr. Pfungst’s skeptical “show-me-the-evidence” approach. More specifically, the working definition of psychology that we will use throughout this book is a part of our Core Concept for this section of the chapter:

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

We can find the original meaning of psychology in the Greek roots of the word. *Psyche* means “mind”—which the ancient Greeks believed to be separate and distinct from the physical body—and the suffix *-ology* means “a field of study.” Therefore, “psychology” literally means “the study of the mind.” Psychologists today, however, use the broader definition that we included in our Core Concept: Psychology includes not only mental processes but also behaviors. That is to say, psychology’s domain extends across both directly observable behaviors (talking, smiling, and crying, for example) and the internal mental processes that can be only indirectly observed (such as thinking, feeling, and desiring). As you will see later in the chapter, psychologists have not always agreed on these boundaries for their field—particularly on whether subjective mental processes could be explored by a discipline that claims to be a science.

The other important part of our definition, then, involves this scientific aspect of psychology. In brief, the science of psychology is based on objective,
verifiable evidence obtained with the same care used by Pfungst in his study of Clever Hans. Giving you a more complete explanation of what we mean by the science of psychology will occupy much of the rest of the chapter.

For the moment, we want to focus on a point that is only implied in our definition of psychology: the notion that psychology is not mere speculation about human nature, nor is it a body of folk wisdom about people that “everybody knows” to be true. Throughout this book you will find many examples of such “commonsense” ideas that psychological science has shown to be false. Could some of your own beliefs be among them? We challenge you to find out by taking the quiz in the box, “Do It Yourself! Is it Psychological Science or Psychobabble?”

**DO IT YOURSELF!**

Is It Psychological Science or Psychobabble?

“Show me the evidence!” is the rallying cry of critical thinking. This rule has not penetrated our popular culture, where books tell us that men are from Mars and women are from Venus and that some people think with the “left brain” and others with the “right brain.” In fact, much that is called “psychology” by the popular press and on TV is not based on science at all. Likewise, it is a good bet that you will find many volumes in the “Psychology and Self-Help” section of your local bookstore that are based on nothing more than speculation, exaggeration, or misunderstanding—what we call pseudopsychology. According to psychologist Carol Tavris (2000) more scathingly labels psychobabble. Whichever term you prefer, your authors hope that this book will help you spot bogus psychology for what it is.

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 being able to judge 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.)

Answers: The first four items are true; the rest are false. Below you will find 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 and the Foundations of Neuroscience.”)
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 3, “States of Consciousness.”)
3. **True:** The link between mind and body can make you sick when you are under chronic stress. (See Chapter 10, “Stress, Health, and Well-Being.”)
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 5, “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, “Mental Disorders,” and Chapter 13, “Therapies for Mental 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 4, “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 7, “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 and the Foundations of Neuroscience.”)
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 8, “Thinking and Intelligence.”)
10. **False:** Even the most expert polygraph 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.”)
Psychology and Critical Thinking

The Clever Hans incident occurred one hundred years ago. Yet, people today seem as eager as ever to embrace fantastic claims—especially those of mysterious powers of the mind and supernatural influences on our personalities. For evidence, we have to look no further than the horoscope in the daily newspaper. Never mind that astrology has been thoroughly debunked (Schick & Vaughn, 2001). And the same goes for graphology (the bogus science of handwriting analysis), fortune telling, and the purported power of subliminal messages in the movies or on TV to persuade us to buy certain products or vote for certain politicians. All fall under the heading of pseudopsychology: phony, unscientific psychology masquerading as the real thing.

One of the goals your authors have for this book is to help you differentiate between psychology and pseudopsychology—that is, to think critically about claims made under the name of psychology. Most people, of course, think of themselves as good thinkers—just using common sense—but, as we will see over and over again in this book, what masquerades as psychological common sense has often turned out to be wrong. “Common sense,” after all, has led many people to accept uncritically the polygraph (the so-called lie detector), the superiority of certain racial groups, demonic possession as a cause of mental illness, the brutal brain operation sometimes called the “lobotomy,” and the notion that horrific deeds (such as the recent torture of prisoners in Iraq) are perpetrated by just a few “bad apples.”

Harmful Effects of Pseudopsychology

So, what’s the big deal if people want to believe such things? We—your authors, Drs. Phil, Bob, and Ann—suggest that there are two sets of problems.

First, those who uncritically accept the claims of pseudoscientific psychology risk depriving themselves of some real psychological insights that are even more interesting and useful. To give one example, few people realize that we humans are highly susceptible to confirmation bias. That is, we pay attention to events that confirm our beliefs and ignore evidence that contradicts them (Halpern, 2002). Knowledge of the confirmation bias helps us understand why, for example, astrology fans usually remember those days when the horoscope seems accurate and forget the days when it misses the mark.

The second set of problems with pseudopsychology involves the potential for more serious harm. For example, unfounded psychological beliefs (pseudopsychology) can waste time, money, and talent—even lives—as you will see when we discuss false “recovered memories” of sexual abuse (in Chapter 7) or when the presumption of female intellectual inferiority keeps women out of “men’s jobs.” Some people still don’t know that psychological science long ago demonstrated that memory is not always accurate and that neither sex is intellectually inferior to the other (Neisser et al., 1996).

Pseudopsychology can also provide a fertile field for fraud. This happens when people are bilked by fortune-tellers, handwriting analysts (graphologists), or astrologists, who claim to have special knowledge of personality. Still another form of harm (of special concern to psychologists) involves diminished public support for legitimate psychological science.

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 reference in hand, your library can help you find the original source.
Merely raising questions about accepted pseudoscientific beliefs can sometimes be dangerous. For example, in some parts of the United States only a few decades ago, those who dared to question the presumed mental and moral inferiority of African Americans were sometimes beaten, jailed, or lynched. Even today, in many regions of the world, posing critical questions about the status of women or particular racial groups still carries dire consequences.

**Dangerous Therapies: The Facilitated Communication Fiasco** Yet another potential harmful consequence of pseudoscientific psychology lurks in unvalidated therapies for psychological disorders. Let’s consider an example involving *facilitated communication*, a widely acclaimed treatment for *autism* (a developmental disorder that can severely impair attention, language, and social functioning) that was popular in the 1990s. The treatment (which we will explain in a moment) is based on the erroneous belief that autism sufferers can have impressive verbal abilities that lie hidden by their disorder.

In brief, facilitated communication is a method by which a helper (or facilitator) attempts to communicate with an autistic person by asking questions and then assisting the person to respond by typing or pointing to letters on a letter board. (You can see how this is done in the accompanying photo.) You may have already identified the problem with this method: making sure that it is the autistic person who is really responding, rather than the facilitator.

Initially, the reports on facilitated communication were promising—even enthusiastic. But some psychologists were skeptical. They pointed out that the glowing reports were simply anecdotes, lacking in strict scientific controls. They also expressed concern that the helper might be consciously or unconsciously guiding the child’s hand to produce the messages. (You have probably noticed the parallels with the case of Clever Hans.)

Sure enough, when studies of facilitated communication were done under controlled conditions, the results showed the skeptics’ concerns to be well founded (Cabay, 1994; Wheeler et al., 1993). When the facilitator knew the questions being asked, the autistic child would seem to give sensible answers. But when “blinders” were applied—by hiding the questions from the facilitator—the answers were inaccurate or nonsensical. In fact, the experiments that demonstrated the flaws in facilitated communication employed essentially the same design that Dr. Pfungst used almost a century before to test Clever Hans.

Sadly, even though facilitated communication had extended hope to beleaguered parents and teachers, psychological research dashed those hopes. Moreover, the consequences of an uncritical belief in facilitated communication proved worse than false hopes. Not only did the use of facilitated communication mean that more effective treatments were delayed, but many parents blamed themselves when their children did not respond as expected to the treatment (Levine et al., 1994). Worst of all may have been the false accusations of sexual abuse derived from facilitated messages thought to have come from the autistic children (Bicklen, 1990; Heckler, 1994). The controlled studies left little doubt that the messages describing abuse originated wholly in the minds of the facilitators. In the wake of these findings, the American Psychological Association (2003b) denounced facilitated communication as a failure and relegated it to the junk pile of ineffective therapies.

**The Skeptical Psychologist** So, what lesson can you, as a student of psychology, draw from the facilitated communication fiasco and from the case of Clever Hans? After all, you won’t be able to run your own scientific test on every fantastic-sounding claim that comes along. We hope that you will develop a skeptical, critical attitude about reports of amazing new treatments,
dramatic psychological “breakthroughs,” and products that claim to help you develop “untapped potential.” And, we hope you will always pause to ask: Is there a simpler explanation? Has someone done a controlled test? Could the claims be merely the result of people’s expectations—that is, could confirmation bias be at work? By doing so, you will have adopted the skeptical, show-me-the-evidence attitude of a good psychologist. This is exactly the approach that we will take on the journey through psychology that we begin in this chapter.

What Do Psychologists Do?
In the next few pages you will discover that psychology is a more diverse field than most people realize. Many students enroll in their first psychology course expecting that it will deal mainly with mental disorders and psychological therapies. But they soon find that psychology is also about learning, memory, perception, intelligence, personality, social interaction, thinking, emotion, and many more concepts that we will explore throughout this book. In the remainder of this section, we will first confront a stereotype about psychologists, and then we will show you three main ways to be a psychologist. After that, you will learn about some of the field’s principal areas of specialization and, finally, about the difference between psychologists and psychiatrists.

Not All Psychologists Are Therapists
Contrary to the popular stereotype, psychologists are not all therapists. You will find them at work almost everywhere: in education, industry, sports, prisons, government, churches and temples, private practice, and in the psychology departments of colleges and universities (see Figure 1.1). Psychologists also work for athletic teams, 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, equipment design—and psychotherapy. Psychology’s specialties are too numerous to cover them all here, but we can give you the flavor of the field by first dividing psychology into three broad categories.

Three Ways Of Doing Psychology
Broadly speaking, we can divide psychology into three main branches or categories: experimental psychology, teaching of psychology, and applied psychology. Experimental psychologists are the workhorses who do the basic research in psychology. Most are faculty members at a college or university. This group, also called research psychologists, is the smallest of the three major branches of psychology (Fricke & Pate, 2004).

The second category, teachers of psychology, overlaps with the experimentalists, because most researchers also teach classes at the colleges or uni-
versities where they do their experimental work. Increasingly, however, large numbers of psychologists are hired by high schools, colleges, and universities primarily to teach. Community colleges alone employ some 9000 psychologists in teaching positions across the United States (Johnson & Rudmann, 2004). 

**Applied psychologists** use the knowledge developed by experimental psychologists to tackle human problems, such as training, equipment design, and psychological treatment. Applied psychologists work in a wide variety of places such as schools, clinics, factories, social service agencies, airports, hospitals, and casinos. All told, some 64% 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; Rosenzweig, 1992; Stapp et al., 1985).

**Applied Psychological Specialties** What, exactly, do applied psychologists do? Here are profiles of some of the most popular applied specialties:

- **Industrial and organizational psychologists** (often called I/O psychologists) specialize in modifying the work environment to maximize productivity and morale. Some I/O psychologists develop interview and testing procedures to help organizations select new employees; some develop programs to train and retain employees; and others specialize in market research.

- **Sports psychologists**, as you might expect, work with athletes to help them maximize their performance. They deal with enhancing motivation, controlling emotions under pressure, and planning practice sessions. Many major sports franchises have sports psychologists on staff.

- **Engineering psychologists** work at the interface between people and equipment. Some design devices, such as control panels or airplane instrument displays, for easy and reliable human use. Some do psychological detective work to discover what went wrong in accidents attributed to “human error.” Engineering psychologists are usually employed by private industry or the government and often work on a team with other scientists.

- **School psychologists** have expertise in the problems of teaching and learning. Typically, they work for a school district, where they diagnose learning and behavior problems and consult with teachers, students, and parents. School psychologists may spend a good deal of time administering, scoring, and interpreting psychological tests.

- **Rehabilitation psychologists** serve with physicians, nurses, counselors, and social workers on teams that may treat patients with 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.

- **Clinical psychologists** and **counseling psychologists** work with people who have problems with social and emotional adjustment or those who face 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, 2003c). The clinician is more likely to have a private practice involving psychological testing and long-term therapy, while the counselor is more likely to work for an agency or school and to spend fewer sessions with each client.

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 (2003).
PSYCHOLOGY IN YOUR LIFE: KNOWING THE DIFFERENCE BETWEEN A PSYCHOLOGIST AND A PSYCHIATRIST

Students sometimes worry that their psychology professors are going to “psychoanalyze” them. Apparently, they believe that psychologists stand ever vigilant—just waiting for signs of mental disorder to appear. To put your mind at rest, this is only a stereotype: People commonly think that all psychologists are clinical psychologists—but you have already learned that isn’t true. In fact, many psychologists have no training at all in the diagnosis and treatment of mental disorders.

One other point of confusion blurs the public image of psychology: the distinction between psychology and psychiatry. Psychiatry is a medical specialty, not a part of psychology. Psychiatrists hold MD (Doctor of Medicine) degrees and have also had specialized training in the treatment of mental and behavioral problems. Therefore, psychiatrists are licensed to prescribe medicines and to perform other medical procedures. Consequently, psychiatrists tend to view patients from a medical perspective. In the public mind, however, psychiatry often gets confused with clinical psychology because both professions treat people suffering mental disorders. Psychologists like to point out that, while psychiatric training emphasizes mental illness, it gives short shrift to basic psychological topics, such as perception, learning, psychological testing, and developmental issues.

By contrast with psychiatry, psychology is a much broader field, encompassing many different specialties. Each specialty—such as experimental, engineering, teaching, and I/O psychology—has its own focus. As we have seen, most have nothing to do with the diagnosis and treatment of mental disorders. Moreover, while psychologists typically hold doctoral degrees, their training is not in medicine. (Only a few psychologists have taken the necessary medical coursework that qualifies them to prescribe drugs for psychological problems.) Instead, graduate training in psychology focuses on training in research methods, along with advanced study in a particular psychological specialty.

So, now you can sound smarter than most people when you talk about psychology and psychiatry. But, what about the difference between a psychologist and a psychoanalyst? We’ll look into that in the next section.

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CHECK YOUR UNDERSTANDING

1. **RECALL:** Experiments showing facilitated communication to be ineffective were similar to the experiment that exposed Clever Hans. Specifically, what did both experimental procedures have in common?
   a. Neither the horse nor the autistic children could see the questions.
   b. Neither Von Osten nor the facilitators could see the questions.
   c. Both Hans and the autistic children were given incentives for producing correct answers.
   d. In both situations, correct answers were given about half the time.

2. **APPLICATION:** The confirmation bias refers to a mental process that explains, among other things, why people:
   a. engage in risky behavior.
   b. seek help from psychiatrists.
   c. believe in astrology.
   d. become autistic.
WHAT ARE PSYCHOLOGY’S HISTORICAL ROOTS?

People have probably always speculated about human behavior and mental processes. Written records, dating back some 25 centuries to the Greek philosophers Socrates, Plato, and Aristotle, include ideas about consciousness and madness. They observed that emotions can distort thinking and that our perceptions are merely interpretations of the external world. Most people today would probably agree with many of these ancient ideas—and so would modern psychology.

On the other hand, the Greeks also came up with some psychological notions that now seem quaint or amusing. They believed, for example, that emotions flow from the heart, the liver, and the spleen, and that mental disorder could be caused by excessive bile. Following their lead, we still use the metaphor of “heartfelt” emotions, and we may “vent the spleen” when we are angry.

But we can give the Greeks only partial credit for laying the historical foundations for psychology. At roughly the same time, Asian and African societies were developing their own psychological ideas. In Asia, 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 Western psychology and psychiatry today (Lambo, 1978). It was, however, the Greek tradition and, later, the Roman Catholic Church that most influenced the tortuous development of Western psychology as a science.

Oddly—and significantly—it never occurred to any of the ancient thinkers to put their speculations to a test, in the same way that Pfungst tested his suspicions about Clever Hans. In the Greek mind, truth came from casual observation, logic, and the authority of experts. Then, a few hundred years later, when the medieval Church gained control of Europe, clerics sought to minimize inquiry into human nature because they had little interest in the “world of the flesh.” In fact, the Church taught that the mind and soul operate completely outside the natural laws that govern worldly objects and events. For medieval Christians, the human mind—like the mind of God—presented an unsolvable mystery.
This view prevailed until the 17th century, when French philosopher René Descartes (Day-CART) dared to assert that human sensations and behaviors are based on activity in the nervous system. His idea fit well with exciting new discoveries about the biology of nerve circuits in animals. For example, science had just shown how the sense organs convert stimulation into the nerve impulses and muscular responses. This discovery allowed scientists, for the first time, to see that there were biological processes (rather than mysterious spiritual forces) behind sensation and simple reflexive behaviors. Yet, despite these major advances, psychology itself would not become a distinct scientific discipline for another two centuries after Descartes. As we will see, it took two revolutionary ideas to make a science of psychology possible.

Before we get to that, however, let’s take a moment to state our Core Concept for this section, which emphasizes five of the competing viewpoints that emerged in the early days of psychology, as the field struggled to become a science:

Modern psychology developed from several conflicting traditions, including structuralism, functionalism, Gestalt psychology, behaviorism, and psychoanalysis.

After you have studied this section, you should be able to explain the basic assumptions of each tradition and the issues on which they were in conflict.

**Structuralism: Focus on Structure—and the Founding of Scientific Psychology**

One of the two revolutionary ideas to shape the early development of psychology emerged in the mid-1800s. In his book *On the Origin of Species* (1859), Charles Darwin suggested a biological kinship between humans and animals. For psychologists this would mean that discoveries about animal biology and behavior could be applied (with caution, of course) to people. So, for example, Helmholtz’s pioneering research on nerve impulses in frogs helped psychologists understand human reflexes. Likewise, Darwin’s insight meant that Pavlov’s later work on learning in dogs could also throw light on human learning—as we shall see in Chapter 6.

The second big idea that shaped the early science of psychology arose in chemistry, where scientists had noticed patterns in properties of the chemical elements that led them to develop the periodic table. At one stroke, the periodic table made the processes underlying chemical reactions clear. This achievement particularly intrigued one Wilhelm Wundt, a German scientist (who, incidentally, became the first person to call himself a “psychologist”). Wundt wondered: Could a similar approach simplify our understanding of the mind? Could he discover “the elements of conscious experience”? Wundt’s quest for the elements of consciousness became known as **structuralism**, because it focused on revealing the most basic “structures” or components of the mind (Fancher, 1979).

To pursue his dream of establishing a science of consciousness, in 1879 Wundt established an institute for psychological research at the University of Leipzig. There, in a new laboratory, Wundt and his students began to conduct studies on what they supposed to be the “elements” of consciousness: sensation and perception, memory, attention, emotion, cognition, learning, and language. All our mental activity, they asserted, was combinations of such basic processes. In their experiments, they presented trained volunteers with a variety of simple stimuli and asked them to respond with the press of a lever or a description of their sensations—a technique called **introspection**.
From the outset, structuralism was a magnet for critics, who attacked and ridiculed Wundt from all sides. In particular, many objected to his introspective method as being too subjective. After all, they said, how can we judge the accuracy of people’s description of their thoughts and feelings?

But, Wundt has had the last laugh—even though structuralism no longer exists as a recognized “school” of psychology. Psychologists still rely on his introspective method for obtaining dream reports and evidence of perceptual changes, such as those you will experience in the Necker cube demonstration in the upcoming “Psychology in Your Life” section. And, for one more reason, Wundt, if he were alive today, would still be laughing: The topics that he and his students first identified and explored can be found as chapter headings in every introductory psychology text, including this one.

**Functionalism: Focus on Function**

One of the most vocal of Wundt’s critics, the American psychologist William James, argued that structuralism’s approach was far too narrow. (He also said that it was boring—which didn’t help his already strained relationship with Wundt [Fancher, 1979].) James argued that psychology should include the function of consciousness, not just its structure. In a famous metaphor, he pictured a “stream of consciousness” as a mental process that had no static structure but was continually flowing, changing, and interacting with the environment. Appropriately, James’s brand of psychology became known as functionalism.

James found Charles Darwin’s ideas much more interesting than Wundt’s. In particular, he 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 everyday world outside the laboratory. Recurring bouts of depression probably added to his concern with problems of everyday living (Ross, 1991).

Where did this approach lead the functionalists? Much of their work had a practical bent: They were the first applied psychologists. James wrote extensively on the development of learned “habits,” emotions, the psychology of religion, and teaching. Appropriately, one of his followers, John Dewey, founded the “progressive education” movement, which emphasized learning by doing, rather than by merely listening to lectures and memorizing facts.

**Gestalt Psychology: Focus on the Whole instead of the Parts**

Another challenge to Wundt’s structuralism came from a rebellious group in his native Germany. In some respects, their approach, known as Gestalt psychology, was exactly the opposite of the structuralism: The Gestalt psychologists were interested in how we construct “perceptual wholes” (or Gestalts, in German), such as our perception of a face, rather than just a conglomeration of lines, colors, and textures. (The structuralists, you will remember, focused on the parts, or elements of consciousness, not on the whole.) But, for Gestalt psychology, understanding perception was merely the means to the even more
important end of understanding how the brain works. Like both the structuralists and functionalists, psychologists of the Gestalt “school” (or philosophical approach) relied on introspection. Prominent Gestalt psychologists include Max Wertheimer, who studied visual illusions and ambiguous figures, such as the Necker cube, which you will see in a moment (page 000). Another psychologist, Wolfgang Köhler, extended the reach of Gestalt psychology to insight learning, an overlooked form of learning marked by sudden “Aha!” experiences. We will see much more of the Gestaltists in our study of perception (Chapter 5).

Behaviorism: Eliminate the Mind and Focus on Behavior

A particularly feisty group, known as the behaviorists, disagreed with nearly everyone. Most notably, they proposed the novel idea that consciousness should not be a part of psychology at all! John B. Watson, the leader of the behavioral movement, argued that a true and 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—not the mind.

In general, behaviorism rejected any psychology of subjective mental processes. But, in particular, behaviorists objected to introspection, the practice of asking people to report on their mental experiences—a technique that the structuralists, functionalists, and Gestalt psychologists all used. Watson and his behaviorist followers cared nothing about what people were thinking. Instead, they wanted to know how people would act (for example, whether a child would respond with fear to a rabbit which, on an earlier presentation, had been accompanied by a sudden loud noise).

We will encounter behaviorism again in the next section of the chapter because it is one of the ancestral lines of psychology that continues to live on in the present day.

Psychoanalysis: Focus on the Unconscious Mind

Yet another objection to Wundt’s approach to psychology came from medicine—specifically from the Viennese physician Sigmund Freud and his disciples, who were pioneering the psychoanalytic method of treating mental disor-
The cube in Figure 1.2A will trick your eye—or, more accurately, it will trick your brain. If you look at it for a few moments, it will suddenly seem to change perspectives. For a time you may see it as if from the upper right (Figure 1.2B), and then it will abruptly shift and appear as though you were seeing it from the lower left (Figure 1.2C). It may take a few moments to see the shift. 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.

We feel compelled to confess that the alternating-cube phenomenon was not discovered by a psychologist. Rather, it was first noticed by Swiss geologist Louis Necker in 1832, while he was looking at cube-shaped crystals under a microscope. Since that time, it has been known in his honor as the Necker cube. For our purposes, Necker’s amazing cube illustrates two important points.

First, it illustrates the much-maligned process of introspection, pioneered by Wundt and his students. Please note that the only way we can demonstrate that the Necker cube changes perspectives in our minds is by having people look at it 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, whatever it is involves more than simply 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 take away message is that we don’t simply sense the world as it “really” is, but we perceive it by adding our own interpretations.

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 one right understanding of behavior and mental processes. Put another way, to understand psychology fully, we must alternately shift our view points among multiple perspectives. And what are those perspectives? We will explore seven of the most important ones in the next section.
WHAT ARE THE PERSPECTIVES PSYCHOLOGISTS USE TODAY?

During the past century, the picture of psychology was both enriched and complicated by ideas borrowed from many sources. The result is a field that resembles a slightly dysfunctional family, with a few common interests and lots of family squabbles. In our Core Concept we simplify this family portrait by focusing on seven especially important viewpoints:

Seven main perspectives characterize modern psychology: the biological, developmental, cognitive, clinical, behavioral, trait, and sociocultural views.

The champions of each view see behavior and mental processes in a slightly different way—much like seven painters portraying the same scene from different vantage points. You are likely to find experimental psychologists and teachers of psychology holding any of these viewpoints. Among applied psychologists who do counseling, therapy, and personnel selection work, however, the trait and clinical views predominate. As you read the following pages, you should focus on the important ideas that distinguish each view from the others.

The Biological View

The biological view emphasizes how your physical makeup and the operation of your brain influence your personality, preferences, behavior patterns, and abilities. More specifically, psychologists taking the biological approach search
for the causes of behavior in heredity, in the nervous system and the endocrine (hormone) system, and in the effects of environmental insults such as disease (not insults of the other kind). As you might imagine, the biological view has strong roots in medicine and biological science. Often, the enterprise of biological psychology, along with biology, neurology, and other disciplines interested in brain processes, is referred to as neuroscience.

Neuroscience is a “hot” area at the moment. Thanks to spectacular advances in computers and brain-imaging techniques, neuroscientists have made amazing strides in understanding the brain during the past decade. Among their achievements, they 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 they have discovered brain wave patterns associated with the hidden world of sleep and dreams.

One important variation on the biological view again draws on the ideas originally proposed by the famous British scholar and naturalist Charles Darwin. Evolutionary psychology suggests that many human traits arise from hereditary characteristics established in our remote ancestral past. In this view, our genetic makeup—including our most deeply ingrained behaviors—were shaped by the conditions faced by our ancestors thousands of years ago.

All through the history of the species, environmental forces have pruned the human family tree, favoring the survival and reproduction of those individuals with the most adaptive mental and physical characteristics. Charles Darwin called this natural selection. Through this process, the physical characteristics of a species evolve (change) in the direction of characteristics that give the fittest organisms a competitive advantage.

Proponents of evolutionary psychology say that virtually all human behavior—even the most destructive behavior, such as warfare, homicide, and racial discrimination—has grown out of genetic tendencies that once may have helped humans adapt and survive. This approach has also suggested some highly controversial explanations for certain gender differences—why, for instance, men typically have more sexual partners than do women.

The Developmental View
Change may be the only constant in our lives. In the developmental view, psychological change results from an interaction between the heredity programmed in our genes and the experiences presented by our environment. A big question, however, involves the relative contributions made by our genes and by our surroundings in shaping who we become: Which counts most heavily, heredity or environment, nature or nurture?

Developmental psychologists also study how we change as we grow older and how we change by developing social skills, learning language, and assimilating the expectations of our culture. Much of their research has focused on child development. Increasingly, however, developmental psychologists have begun to look at how development unfolds in teens and adults. In the developmental chapter of this book, we will explore the sweeping patterns of psychological change seen across the lifespan, from before birth to old age.

The Cognitive View
The next of psychology’s multiple modern perspectives suggests that our thoughts and actions arise from the way we interpret our experiences. From this viewpoint, understanding ourselves requires that we look in our minds, as well as our biology.
In the cognitive view, our actions are profoundly influenced by the way we process information streaming in from our environment. Cognitive psychologists study all sorts of mental processes, or cognitions—thoughts, expectations, perceptions, and memories, as well as states of consciousness. You might think of them as the heirs to the best of the structuralist, functionalist, and Gestalt traditions.

Modern cognitive psychologists have also borrowed from linguistics the idea that our most basic language abilities are wired into our brains at birth (Pinker, 2002). From computer science they have borrowed the metaphor of the brain as a biological computer—designed as a processor of information (Gardner, 1985; Gazzaniga, 1998a; Sperry, 1988). And from medicine they have borrowed the technology that now allows visualizing the activity of the brain and connecting it to mental processes. Cognitive psychologists who are especially interested in the connections among mind, brain, and behavior have pioneered a hybrid field called cognitive neuroscience.

The Clinical View

A special interest in mental health and mental disorder characterizes the clinical view. Most commonly, you will find its adherents practicing counseling or psychotherapy. But the two main groups that comprise this perspective—psychodynamic psychology and humanistic psychology—have taken this interest in different directions.

Psychodynamic Psychology  The term psychodynamic comes from the belief that the mind (psyche) is a reservoir of energy (dynamics). Accordingly, psychodynamic psychology says that we are motivated primarily by the energy of irrational desires generated in our unconscious minds (Murray et al., 2000). This approach has been especially attractive to practitioners who specialize in psychotherapy. As a result, the psychodynamic perspective has emphasized the treatment of mental disorders over scientific research.

The best-known representative of the psychodynamic approach was Sigmund Freud, who founded psychoanalysis (and whom we met earlier in our tour of psychology’s historical “schools”). Originally a medical technique devised to treat mental disorders, psychoanalysis portrays the mind as a sort of mental boiler that holds the rising pressure of unconscious sexual and destructive desires, along with memories of traumatic events. Even today, most psychoanalysts are medical doctors with a specialty in psychiatry and advanced training in Freudian methods. (And now you know the difference between a psychologist and a psychoanalyst.)

Humanistic Psychology  The other main variation on the clinical view is called humanistic psychology. According to this perspective, your actions are hugely influenced by your self-concept and by your need for personal growth and fulfillment. Far more than the psychoanalysts, humanistic therapists emphasize the positive side of our nature: human ability, growth, and potential.

Led by the likes of Abraham Maslow (1968, 1970, 1971) and Carl Rogers (1951, 1961, 1977), humanistic psychologists have also rejected what they saw as the cold, mechanical approach of scientific psychology. In its place, they have offered a model of human nature emphasizing the free will people have to make choices affecting their lives. They have also pressed psychology to take a greater interest in feelings and the self-concept (Cushman, 1990). 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.
The Behavioral View

A wholly different approach harks back to John Watson and the early days of psychology. Behaviorism says we should look for the causes of behavior in our environment rather than in our biology or our minds (Murray et al., 2000). This behavioral view, then, calls attention to the ways rewards and punishments shape how we act.

As we saw a few pages ago, in our discussion of psychology’s historical roots, behaviorism first emerged as a revolution against the subjective methods used by Wundt, James, and others in the structuralist and functionalist traditions. In brief, the behaviorists totally reject a science of inner experience. Instead, they choose to study the person entirely from the outside, focusing only on what they can observe directly: the effects of people, objects, and events on behavior. And this is still the approach taken by hard-core behaviorists (although we will see in Chapter 6 that some renegades, calling themselves cognitive behaviorists, have opened behaviorism’s door to mental processes). The behaviorists have made their greatest contribution by giving us a detailed understanding of how the environment affects learning—especially through rewards and punishments.

B. F. Skinner, the most influential American behaviorist, argued that the concept of “mind” has led psychology in circles, chasing something so subjective that it cannot even be proved to exist (Skinner, 1987, 1989, 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).

The Trait View

The Greeks, who seem to have had their hands in almost everything, proclaimed that our personalities are ruled by four body humors (fluids): blood, phlegm, melancholy, and yellow bile. Depending on which fluid is most abundant, your personality might be sanguine (dominated by blood), slow and deliberate (phlegm), melancholy (melancholy), or angry and aggressive (yellow bile).

We no longer buy into the ancient Greek typology, of course, but their idea of personality traits lives on in modern psychology, especially among psychologists interested in personality and personality testing. Traits, to a psychologist, mean long-lasting personality characteristics, such as introversion or extraversion—as contrasted with temporary mood states. This trait view is common among psychologists who do mental testing, including clinical, counseling, and I/O psychologists.

Among experimentalists and teachers of psychology, you will find the trait view especially among those who are interested in the field of personality. We will see later in the book that proponents of this trait perspective have identified five major personality dimensions, cleverly named the Big Five. Significantly, these dimensions have proved to be valid for classifying people living in virtually any culture around the world.

The Sociocultural View

Who could deny that people exert powerful influences on each other? The sociocultural view makes this idea of social influence the focus of psychology. Social psychologists have used this perspective to probe the mysteries of liking, loving, prejudice, aggression, obedience, and conformity.

And, speaking of culture (as we were a moment ago), even social psychologists overlooked the effects of the larger social context called culture until
recently. As a complex blend of human language, beliefs, customs, values, and traditions, culture exerts profound influences on all of us—as we can readily see by comparing people in, say, the California-Mexican culture of San Diego with the Scandinavian-based culture of Minnesota. Psychology’s 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).

Now the perspective has begun to broaden. 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 (Cushman, 1990). Recognizing this bias, cross-cultural psychologists have begun the long task of reexamining the “laws” of psychology across cultural and ethnic boundaries (Fowers & Richardson, 1996; Gergen et al., 1996; Segall et al., 1998; Triandis, 1994, 1995).

To summarize the perspectives we have just covered, please have a look at Table 1.1. There you will find an 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.

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, among psychologists espousing a sociocultural perspective, those who put the emphasis on culture are gaining ascendancy. Meanwhile, the behavioral camp seems to be losing ground, as are the Freudian folk, among those holding the clinical perspective. We also call your attention to an especially noteworthy trend among 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 Amer-
By 1921 the proportion had risen above 20%. And now, women receive approximately two-thirds of the new doctorates awarded in psychology each year (Kohout, 2001). Although psychology has always included a higher proportion of women than any of the other sciences, women have too often found gender-related biases in their psychological career paths (Furumoto & Scarborough, 1986). For example, G. Stanley Hall, one of the pioneers of American psychology, maintained 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 (Furumoto, 1991). Calkins had earlier been denied a doctorate by Harvard University because of her gender even though she had completed all the requirements. In these early days of psychology, as in all fields of science, women were pressured to choose between marriage and career. Amazingly, even those who managed a career were usually limited to teaching at women’s colleges, positions with less prestige. Still, they made important contributions to their developing field, as you can see in a sampling presented in Table 1.2.

### TABLE 1.1  Seven Major Perspectives in Modern Psychology

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Overview</th>
<th>What Determines Behavior?</th>
<th>Problems and Questions for Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td>We are essentially complex biological systems that respond to both hereditary and environmental influences. This view includes evolutionary psychology.</td>
<td>Behavior is determined by brain structure and chemicals and by inborn responses to external cues for survival and reproduction.</td>
<td>How do the nervous system, endocrine system produce behavior and mental processes? Evolutionary psychologists seek to learn how behaviors may be linked to evolutionary changes that conferred a survival or reproductive advantage on our ancestors.</td>
</tr>
<tr>
<td>Developmental</td>
<td>People undergo predictable patterns of change throughout their lives.</td>
<td>Behavior determined by the interaction of nature and nurture (heredity and environment).</td>
<td>What are the patterns that characterize developmental change? What are the genetic and environmental influences underlying these patterns?</td>
</tr>
<tr>
<td>Cognitive</td>
<td>People are information-processing systems.</td>
<td>Behavior is the result of our mental interpretations of our experience.</td>
<td>What factors influence our mental processes, including sensation, perception, learning, memory, and language?</td>
</tr>
<tr>
<td>Clinical</td>
<td>The clinical approach includes two main variants:</td>
<td>Psychodynamic theory sees behavior arising from unconscious needs, conflicts, repressed memories, and childhood experiences.</td>
<td>Psychodynamic focus: How can our understanding of the unconscious mind help us understand and treat mental disorders?</td>
</tr>
<tr>
<td></td>
<td>1. <em>Psychodynamic psychology</em> emphasizes dark forces in the unconscious.</td>
<td>Humanistic theory focuses on the influence of self-concept, perceptions, interpersonal relationships, and need for personal growth.</td>
<td>Humanistic focus: What factors encourage high self-esteem and mental health, and how can this knowledge be used in counseling and therapy?</td>
</tr>
<tr>
<td></td>
<td>2. <em>Humanistic psychology</em> emphasizes human growth and potential.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral</td>
<td>Our behavior is primarily shaped by learning.</td>
<td>In accordance with the laws of behavioral learning, we respond to stimulus cues and to our history of rewards and punishments.</td>
<td>What are the “laws” that associate our responses with stimulus conditions? And how can they be applied to improve the human condition?</td>
</tr>
<tr>
<td>Trait</td>
<td>Individual differences result from differences in our underlying patterns of stable characteristics (traits).</td>
<td>Behavior results from each person’s unique combination of traits.</td>
<td>How many fundamental traits are there? How can we use trait patterns to predict behavior?</td>
</tr>
<tr>
<td>Sociocultural</td>
<td>People are social animals, so human behavior must be interpreted in its social context.</td>
<td>Behavior is heavily influenced by culture, social norms and expectations, and social learning.</td>
<td>Under what conditions is the social and cultural situation predictive of behavior? How are social influences different across cultures?</td>
</tr>
</tbody>
</table>

*Men of Science* (named with no irony intended). By 1921 the proportion had risen above 20%. And now, women receive approximately two-thirds of the new doctorates awarded in psychology each year (Kohout, 2001). Although psychology has always included a higher proportion of women than any of the other sciences, women have too often found gender-related biases in their psychological career paths (Furumoto & Scarborough, 1986). For example, G. Stanley Hall, one of the pioneers of American psychology, maintained 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 (Furumoto, 1991). Calkins had earlier been denied a doctorate by Harvard University because of her gender even though she had completed all the requirements. In these early days of psychology, as in all fields of science, women were pressured to choose between marriage and career. Amazingly, even those who managed a career were usually limited to teaching at women’s colleges, positions with less prestige. Still, they made important contributions to their developing field, as you can see in a sampling presented in Table 1.2.
Becoming a fully fledged psychologist requires substantial training beyond the bachelor’s degree. The psychology graduate student takes advanced classes in one or more specialized areas and develops skills as a scholar, researcher, and perhaps as a practitioner. Upon 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. In most states, a license to practice psychology requires a graduate degree, usually a doctorate, and 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”). In addition, many practitioners with master’s degrees in the related field of social work offer therapy for emotional problems.

Holders of associate 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, the U.S. Department of Labor’s Occupational Outlook Handbook is a good place to look. Your college’s career or counseling center probably has a copy.

### TABLE 1.2 Early Contributions Made by Women in Psychology

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Institutional Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christine Ladd Franklin</td>
<td>logic and color vision</td>
</tr>
<tr>
<td>Johns Hopkins University</td>
<td></td>
</tr>
<tr>
<td>Kate Gordon</td>
<td>memory and attention</td>
</tr>
<tr>
<td>Mt. Holyoke, Carnegie Tech.</td>
<td></td>
</tr>
<tr>
<td>Julia Gulliver</td>
<td>dreams and the subconscious self</td>
</tr>
<tr>
<td>Rockford University</td>
<td></td>
</tr>
<tr>
<td>Alice Hinman</td>
<td>attention and distraction</td>
</tr>
<tr>
<td>University of Nebraska</td>
<td></td>
</tr>
<tr>
<td>Julia Gulliver</td>
<td>dreams and the subconscious self</td>
</tr>
<tr>
<td>Wellesley College</td>
<td></td>
</tr>
<tr>
<td>Anna McKeag</td>
<td>pain</td>
</tr>
<tr>
<td>Bardwell School</td>
<td></td>
</tr>
<tr>
<td>Naomi Norsworthy</td>
<td>abilities of the child</td>
</tr>
<tr>
<td>Columbia Teachers College</td>
<td></td>
</tr>
<tr>
<td>Millicent Shinn</td>
<td>child development</td>
</tr>
<tr>
<td>unaffiliated</td>
<td></td>
</tr>
<tr>
<td>Helen Thompson</td>
<td>mental traits</td>
</tr>
<tr>
<td>Mt. Holyoke College</td>
<td></td>
</tr>
<tr>
<td>Margaret Washburn</td>
<td>perception</td>
</tr>
<tr>
<td>Vassar College</td>
<td></td>
</tr>
<tr>
<td>Mabel Williams</td>
<td>visual illusions</td>
</tr>
<tr>
<td>unaffiliated</td>
<td></td>
</tr>
</tbody>
</table>

As early as 1880, psychologists were challenging the claims of spiritualists and psychics (Coon, 1992). But even today, psychology continues to dispute the unfounded claims of pseudoscience, which seem to blossom faster than they can be nipped in the bud. Modern sources of questionable psychology include practitioners of astrology, palmistry, graphology, biorhythm analysis, and any number of psychics, seers, and prophets who claim to have special insights into people’s personalities and to be able to predict their futures.

So, what makes psychology different from the pseudoscientific approaches to understanding people? Answer: None of the pseudosciences has survived trial by the scientific method, which is a way of rigorously testing ideas against objective observations. Instead, pseudoscience is based on mere speculation and 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 approaches to the understanding of people? In fact, we do. Psychologists have no problem with sociology, anthropology, and psychiatry, for example, as partners in the enterprise of understanding people. Psychologists 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:

Psychologists, like researchers in all other sciences, use the scientific method to test their ideas empirically.

What is this marvelous method? Simply put, the scientific method is a process for putting ideas to an objective pass–fail test. At the heart of this testing procedure is empirical investigation, the collecting of objective information.
firsthand by making careful measurements based on direct experience. Literally, empirical means “experience based”—as contrasted with speculation based solely on faith, hope, authority, or common sense. To investigate a question empirically is to collect evidence yourself, rather than relying solely on a logical argument or appealing to the opinion of “experts.” Ultimately, a main goal of psychological science is to develop explanations for behavior and mental processes—explanations based on solid empirical studies. We call these explanations theories.

In brief, a theory is a testable explanation for a set of facts or observations (Kerlinger, 1985; Kukla, 1989). Please note that this definition may be quite different from the way you 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. “It’s only a theory,” people may say. But theory means something quite different to a scientist. The essence of a scientific theory is its power to explain the facts and its ability to be tested objectively. 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, Darwin’s theory of natural selection, and, in psychology, social learning theory (which we will discuss in Chapter 6).

To illustrate the scientific method in action, we would remind you how Dr. Pfungst put Clever Hans to the test. But to take a more recent example, let’s look at a simple and elegant psychological experiment published in the Journal of the American Medical Association by . . . a fourth grader (Rosa et al., 1998)! Meet Emily Rosa of Loveland, Colorado. Emily’s school science project, it turned out, challenged a widely held belief in the power of therapeutic touch (TT).

In the early 1990s, TT was touted as a medical therapy, and Emily’s mother, a nurse, had explained to her how TT practitioners attempted to promote healing by moving their hands over the patient’s body without directly touching it. In doing so, they believed that they were detecting and manipulating an energy field radiating from the body. These practitioners claimed they could use TT to treat a wide range of medical and psychological problems—from colic to cancer and arthritis to depression (Gorman, 1999). So effective was it believed to be that the technique was being taught in more than 100 colleges and universities in 75 countries and used by nurses in at least 80 U.S. hospitals.

But did it really work, or was it just another example of flawed common sense? Emily Rosa suspected that TT practitioners were really detecting their own beliefs and expectations, rather than a “human energy field.” So, she put their claims to a simple experimental test, the details of which we will use to illustrate the scientific method.

**The Five Steps of the Scientific Method**

Testing any scientific assertion requires five steps. (See Figure 1.3.) These steps are essentially the same whether the study involves psychology, biology, chemistry, astronomy, or any other scientific discipline. Thus, it is the method that makes these fields scientific, not their subject matter. Ideally, a researcher (such as Emily Rosa) who follows the scientific method will proceed as follows.

**Developing a Hypothesis** The first step calls for coming up with 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 puzzle. For example, a hypothesis stating that introverted people are attracted to extraverted people might be part of a larger, more complex theory tying together all the factors that affect romantic attraction. Sometimes, however, a hypothesis can be just an interesting idea that piques the scientist’s curiosity—as was the case in Emily Rosa’s experiment. Her hypothesis came simply from questioning the value of a treatment (therapeutic touch) that everyone “knew” to be effective.

Like any good scientist, Emily stated her hypothesis in such a way that it could be tested and falsified (shown to be either correct or incorrect). To make her suspicion testable, Rosa had to follow an ironclad requirement of all scientific research: She had to give operational definitions for all the terms in her hypothesis. That is, she had to specify the exact procedures (operations) she would use in setting up the experimental conditions and measuring the results.

Emily wondered: Could TT practitioners accurately sense the presence of her hand when it was placed above one of their hands but out of sight? She hypothesized that they could not. In our earlier example, the study of Clever Hans, Dr. Pfungst also operationalized his hypothesis by stating that the horse could not give the right number of taps with its hoof when it couldn’t see its owner or when the owner couldn’t see the written questions. Here again, the hypothesis was stated operationally—in terms of the procedures that would be used to test it.

So far, so good. But, of course, a scientific study must not stop with a hypothesis. The great failing of pseudosciences like astrology is that they never take the other steps necessary to verify or reject their assertions. Among scientists, however, a hypothesis will be taken seriously only after it has been subjected to rigorous testing.

Performing a Controlled Test A hypothesis must undergo an “ordeal of proof”—a test that it will either pass or fail. Here’s how Emily Rosa conducted her test: She invited each of 21 TT practitioners (varying in experience from 1 to 27 years) to determine which of their two hands (thrust, palms up, through
holes in a screen) was closest to one of her own hands (held palm down, a few inches from either of the practitioner’s hands).

In order to control the conditions of her experiment, Rosa varied only one part of the situation on each trial: whether her hand was above the subject’s left or right hand. We call this variable condition the **independent variable**. Think of the independent variable as a condition that the experimenter changes independently of all the other carefully controlled experimental conditions. The independent variable always involves a systematic variation on the conditions that the experimenter is evaluating in a study. In Pfungst’s study of Clever Hans, the independent variable involved systematically changing the conditions so that (a) Hans could not see his owner or (b) the owner could not see the questions being asked.

In Rosa’s experiment on therapeutic touch, control over the experimental conditions would have been laughable if she had simply held her hand alternately above the volunteers’ left and right hands or followed some other predictable pattern. That is, had the volunteers been able to guess which response was correct, the results of the experiment would have meant nothing. The solution was **random presentation** of the stimulus, which meant that chance alone determined the order in which the stimulus was presented. **Random presentation** is one tool in the experimenter’s bag of tricks for controlling expectations that can skew the results of a study. In Rosa’s experiment, randomization was achieved by a coin flip, which determined whether she presented her hand above the practitioner’s left or right hand. And in Pfungst’s study, randomization meant that there was no predictable pattern (such as 2, 4, 6, 8...) in the correct answers to the problems presented to Hans and his trainer.

**Gathering Objective Data** In the third step of the scientific method, the scientist collects objective **data**: information gathered by direct observation. Such data depend only on the manipulations of the experimental conditions (the independent variable). The data must **not** depend on the experimenter’s hopes, expectations, or personal impressions. In Emily Rosa’s experiment, the data consisted of the number of correct and incorrect responses during the test—whether the practitioners responded correctly to the placement of her hand. Such responses are referred to as the **dependent variable**. The term comes from the assumption that the responses of participants in an experiment depend directly on the conditions to which they have been exposed. As a result, the data will depend on how the independent variable has been manipulated. (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.)

In designing an experiment, the dependent variable must also be given an operational definition. That is, the researcher must specify the procedures (operations) that were used in measuring the responses being observed. This is exactly what Emily Rosa did when she described how she required her participants to respond with guesses of “left” or “right.” The dependent variable in Pfungst’s study consisted of the horse’s hoof-tapping response to each question presented.

**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. Based on that analysis, the hypothesis is accepted or rejected. This usually requires some special mathematical tools, particularly if the data require a close call. Statistical analysis can tell the researcher whether the observed results rise to the level of **significance**—that is, whether the results are likely due to the independent variable or merely due to chance.
A detailed explanation of statistics is 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, your authors have provided a brief introduction to statistics in the Appendix near the end of the book. There you will find a summary of key points and examples of how psychological concepts are quantified (measured and expressed as numbers) and how those quantities can provide meaning and understanding.

In Rosa’s experiment, the statistical analysis was remarkably simple. The chances of getting a correct answer merely by guessing were 50%. That is, half the time the TT practitioners could be expected to give the right answer, even if they had no ability to sense the “human energy field.” So, Rosa set this standard: Her subjects would have to perform significantly above the chance level to support the claim that they can detect a “human energy field.” They did not, so she concluded that practitioners of therapeutic touch were not sensing human energy fields.

Much the same analysis applied to Pfungst’s study, where the chance level of correct responses would be near zero, and any consistent level of correct responses would have supported the hypothesis that Clever Hans could read and calculate. That hypothesis, however, was rejected, because Hans’ responses were incorrect when cues from his owner were controlled.

**Publishing, Criticizing, and Replicating the Results** In the fifth step of the scientific method, researchers must find out whether their work can withstand the scrutiny and criticism of the scientific community. To do so, they might communicate their results to colleagues by publishing them in a professional journal, presenting a paper at a professional meeting, or writing a book. (You may recall that Emily Rosa published her results in *The Journal of the American Medical Association*.) Then they wait for the critics to respond.

If colleagues find the study interesting and important—and especially if it challenges a widely held theory—they may look for flaws in the research design: Did the experimenter choose the participants properly? Were the statistical analyses done correctly? Could other factors account for the results?
Some critics complained that Rosa’s experiment was not an accurate representation of the conditions under which therapeutic touch is done: They claimed that TT depends on the transfer of emotional energy during a medical crisis, and because Emily was not sick she didn’t have disturbances in her energy field that could be detected by TT practitioners.

Critics could have checked Rosa’s work by replicating it. To replicate her experiment they would redo it, perhaps under slightly different control conditions, to see whether they would get the same results. But, as far as we know, Rosa’s experiment was never replicated. (Nor was Pfungst’s.) At this point then, we can say that Rosa’s experimental results have withstood the scientific test. We should also note that Emily’s research earned her a check for $1000 from the Skeptics Society. She also received a plaque from the Guinness Book of Records for being the youngest researcher to have a paper published in a major medical journal.

Criticism and replication of research is a part of a thorough, and sometimes intimidating, screening process that goes on behind the scientific scenes to filter out poorly conceived and executed research. As a result, fewer than 2% of the papers submitted to psychological journals get into print without major revisions. In fact, the majority never see print at all (Eichorn & VandenBos, 1985). Journal editors and book publishers (including the publishers of this book) routinely seek the opinion of several expert reviewers for each submission before agreeing to publish it. Different reviewers often focus their criticism on different facets of the study (Fiske & Fogg, 1990). As a result, the author usually receives helpful, if sometimes painful, suggestions for revision. Only when a hypothesis has survived all these tests will editors put it in print and scholars tentatively accept it as scientific “truth.” We should emphasize, however, that scientific findings are always tentative, forever in jeopardy from a new study that might require a new interpretation and relegate previous work to the scientific scrap heap. Granted, it is an imperfect system, but it is the best method ever developed for testing ideas about the natural world.

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 discuss the various forms that psychological research may take. In addition to experiments, like Emily Rosa’s research, these include correlational studies, surveys, naturalistic observations, and case studies. Each, we will see, has its advantages and limitations.

In brief, an experiment is the tool scientists use to investigate cause and effect under tightly controlled conditions—as when a psychologist wants to find out whether a certain type of therapy can alleviate depression. In contrast, correlational studies are used to study relationships found in events that have occurred naturally in the real world, where the researcher has much less control over the research conditions. A correlational study would be used to investigate a possible relationship between parenting styles and delinquency. Unlike a true experiment, a correlational study can never prove a cause-and-effect relationship. Finally, we will look at three kinds of descriptive research: case studies, naturalistic observations, and surveys. In these, the goal is simply to describe the characteristics of individuals or groups. Political pollsters, for example, do descriptive research.

Experiments Emily Rosa’s study is an example of an experiment, a form of research in which the researcher controls all the conditions and directly manipulates the independent variable. Not only did Rosa and her colleagues design
the apparatus used in their study, but they established the conditions under which subjects were tested. Virtually everything about the experiment was under their control.

Every experiment, including Rosa’s, is designed to answer this question: Does the manipulation of the independent variable cause the predicted change in the dependent variable? To determine this, the experimenter designs two or more ways of treating the participants whose responses are being studied. Thus, in the therapeutic touch study, Rosa created two possible treatment conditions by varying which of the participants’ hands she placed her own hand near. To give another example, in an experiment designed to study a new drug, the two treatments might involve two different groups of volunteers. One would get the experimental drug, while others receive a placebo (pla-SEE-bo), a “drug” with no medical value, such as a sugar pill).

CONNECTION: CHAPTER 5

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

When two groups are used, those exposed to the special treatment (e.g., the new drug) are said to be in the experimental condition of the study. These individuals make up the experimental group. Meanwhile, those in the other group, the control group, are placed in the control condition, where they may receive a placebo or no treatment at all. Thus, the control group is used as a standard against which to compare the subjects in the experimental condition. (See Figure 1.4.)

When an experimenter uses two or more groups of volunteer subjects, it is important to avoid any systematic bias in the way individuals are assigned to the groups. In a drug study, for example, it wouldn’t do for one group to have sicker people than the other or for all the women to be assigned to the experimental group and all the men placed in the control group. A good solution involves random assignment, where people are assigned to each group by chance alone. One way to do this would be to list volunteers alphabetically and assign alternating names to the experimental and control groups. In this way, chance minimizes any potential differences between the two groups.

- **Placebo** Substances that appear to be drugs but are not. Placebos are often referred to as “sugar pills” because they might contain only sugar, rather than a real drug. Placebos cause a placebo effect in many people who take them.
- **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.
- **Random assignment** A process used to assign individuals to various experimental conditions by chance alone.
Correlational Studies  Sometimes, for practical or ethical reasons, the researcher cannot control the situation well enough for a careful 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) have a higher incidence of learning disabilities. You couldn’t do an experiment to verify this hypothesis. Why? In an experiment you would manipulate the independent variable by deliberately giving toxic lead-based paint to an experimental group of children. Obviously, this would be hazardous and unethical.

Fortunately, we can find a way around the problem—but at the expense of some control over the research conditions. The solution is a correlational study. In correlational research you, in effect, look for an “experiment” that has already occurred by chance, not by design, in the world outside the controlled conditions of 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 and 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 drawback to a correlational study is that you can never be sure that the groups are really similar in every way. Because you can’t randomly assign subjects or manipulate the independent variable, 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. As scientists often put it: Correlation does not necessarily mean causation.

Scientists usually express the degree of correlation as a number. So, the next step requires calculating a statistic known as the correlation coefficient, often symbolized in formulas by the letter $r$. 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. (Any introductory statistics book will tell you how to do it.) The important
idea is to develop a feeling for what positive correlation, negative correlation, and zero correlation mean. If the variables have no relationship at all, their correlation is 0. You would expect a zero correlation between shoe size and GPA, for example. If, however, the two variables show a relationship in which they vary in the same direction (as one variable’s scores increase, so do the other’s) 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 contrast, 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. In our earlier example, we predicted that lead levels in the blood would be negatively correlated with IQ scores.

It is 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 a measure of anxiety (such as a checklist of anxiety-related symptoms) shows a negative correlation of –0.7 between anxiety and time spent studying. In other words, more study is associated with less anxiety. 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). 

**Surveys** If you want to know about people’s attitudes, preferences, or other characteristics, you don’t need to do an experiment or a correlational study. You can simply ask them for the information, using a survey. This is the method 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 clarity of its questions and the accuracy and honesty of the respondents’ reports (Schwarz, 1999).

**Naturalistic Observations** When the researchers want to know how individuals act in their natural surroundings (as opposed to the artificial conditions of a laboratory), they may use the method of naturalistic observation. Naturalistic observation might be a good choice for studying child-rearing practices, people’s shopping habits, or public courting behaviors. The method is also used extensively to study animal behavior in the wild. It was, in fact, the approach used by Jane Goodall in her classic studies of chimpanzee culture. Thus, the setting for a naturalistic observation could be as varied as a shopping mall, a classroom, a home, or a remote wilderness. But, because the researcher merely observes, rather than controlling the conditions or manipulating the independent variable, naturalistic observations are made under far less controlled conditions than are experiments.

**Case Studies** Yet another kind of research, the case study, focuses on only a few individuals—sometimes just one. The method is usually reserved 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 seven highly creative individuals, including Einstein, Picasso, and Freud. Psychoanalysts have also used this approach, calling it the clinical method, to develop theories about mental
disorder based on material gathered from their patients. The disadvantages of the case study method, of course, lie in its subjectivity and its small sample size. These limitations 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 insights that could be obtained in no other way.

Sources of Bias in Research (or Anywhere Else)

Think of an issue on which you have strong feelings and opinions—perhaps abortion, euthanasia, or capital punishment. On such topics, our emotions make it difficult to reason objectively. Likewise, emotionally loaded topics can bring out biases that affect the ways an experimenter designs a study, collects the data, or interprets the results. Fortunately, the scientific method, with its public procedures and openness to replication, provides a powerful means to check on an experimenter’s bias. Still, scientists would rather save themselves embarrassment by identifying and controlling their biases before they hit print. Here are some forms of bias to which they must be alert.

Personal bias involves an individual’s beliefs, preferences, assumptions, or prejudices. Often these are not obvious to the individual holding such biases. For example, in his book *Even the Rat Was White*, psychologist Robert Guthrie (1998) points out the personal bias in the long tradition of using mainly white subjects in psychological research. Whatever form it takes, personal bias can cause scientists to notice only the evidence confirming their hypotheses and to ignore contrary data.

Expectancy bias also affects observations when observers expect—and look for—certain outcomes. (Expectancy bias is closely related to confirmation bias, which we discussed earlier in this chapter.) We can see expectancy bias at work in a classic study in which psychology students timed groups of rats running through a maze (Rosenthal & Jacobson, 1968a). 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 selected both groups of rats from the same litters.) Amazingly, the students’ data showed that rats believed to be bright outperformed their supposedly duller littermates.

These sources of bias can not only lead to erroneous conclusions, but they can also be expensive. Imagine that you are a psychologist working for a pharmaceutical company that wants you to design a test for a new drug. With millions of dollars riding on the outcome, you will want to do it right. But 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 bias to creep into your study along with people’s expectations.

We have seen that a common strategy for controlling expectancy bias in a drug study is to keep participants in the research experimentally “blind,” or uninformed, about whether they are getting the real drug or a placebo. An even better strategy is to keep both the participants and the experimenter clueless about which group receives what 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. Such a research strategy is called a double-blind study. This strategy assures that the experimenters will not inadvertently treat the experimental group differently from the control group, so that neither group will get any clue about the expected response to the pills they are taking.

Aside from these forms of observer bias, researchers must also try to identify other possible influences on the behavior being studied—influences other
than the independent variable. Such confounding variables are factors that could be confused with the independent variable and thus distort the results. Consider, for example, a study of a stimulant drug (such as Ritalin) used to control hyperactive behavior among schoolchildren. What might be some confounding variables? The drug’s effect might differ because of different body weights, eating schedules, and time, method, or setting of administration. Unless arrangements are made to control all such possible confounding variables—that is, to expose all the subjects to identical conditions—the researcher has no way of knowing which factors really produced the results.

**Ethical Issues in Psychological Research**

A final issue we will consider involves the ethics of research. In psychology, ethical issues surround the possibility that individuals might be hurt or unduly distressed by participating in a poorly conceived psychological study. No researcher would want this to happen, yet the issues are not always clear. Is it ethical, for example, to subject people to severe frustration in an experiment involving a problem that is impossible to solve? Or, in an experiment on aggression, what about deliberately provoking people by insulting them? What degree of unease is too high a price to pay for the knowledge gained from the experiment? These are 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 has published “Ethical Principles of Psychologists and Code of Conduct” (2002), a statement advising researchers of their ethical obligation to shield subjects from potentially harmful procedures. Further, the statement admonishes researchers that information acquired about people during a study must be held confidential and must not be published in such a way that individual rights to privacy are compromised. Nevertheless, gray areas still appear, making ethical problems of research a continuing issue (Ilgen & Bell, 2001; Kimmel, 1991; Knapp & VandeCreek, 2003; Pomerantz, 1994; Rosenthal, 1994).

**Deception** The use of deception poses an especially knotty problem. Under most circumstances, the “Ethical Principles” states that 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 drop out of the study. But 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 if 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.

But who, you might ask, is to judge 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. When deception is used, 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; Bower, 1998d).

**Animal Studies** Another long-standing ethical issue surrounds the use of laboratory animals, such as rats, pigeons, and monkeys. As far back as the mid-1800s, scientists used animals in their research for a variety of reasons. These
included the relative simplicity of animals’ nervous systems and the relative ease with which a large number of individuals could be maintained under controlled conditions. Animals have also served as alternatives to human subjects when a procedure was deemed risky or outright harmful. Concerned about the issue as long ago as 1925, the American Psychological Association established a Committee on Precautions in Animal Experimentation, which adopted guidelines for animal research (Dewsbury, 1990). The American Psychological Association’s “Ethical Principles of Psychologists” (2002) also directs researchers to provide decent living conditions for animal subjects and to weigh any discomfort caused them against the value of the information sought in the research. A 1985 federal law also imposes legal restrictions on animal research (Novak & Suomi, 1988).

Recent years have seen a renewal of concern, both inside and outside of psychology, about the use of animals as subjects, particularly when the research involves painful or damaging procedures, such as brain surgery, electrode implants, and pain studies. Some people feel that the limitations should be more stringent 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). Many psychologists, however, support animal research under the APA guidelines (Blum, 1994). At present, the issue remains a hot one.

Questions Science Cannot Answer

It is important to understand that science is not the best approach for finding answers to every important question in our lives. Even scientists don’t take a scientific approach to everything. The scientific method is merely 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. On the other hand, science is not appropriate for answering questions that cannot be empirically tested—such as questions of ethics, morality, religious beliefs, or preferences. To see what we mean, please look at Table 1.3, which shows some of the questions that science can never answer.
Whatever your intended major field of study, you will want to learn more about the professional role your chosen field will expect of you. You can do this in several ways: by attending events sponsored by your major department, by getting to know your professors personally, and by taking out student memberships in professional organizations. You should also develop a habit of scanning the field’s main magazines, journals, and newsletters. For those readers who are considering a major in psychology, we suggest that you investigate the following resources.

Professional Organizations in Psychology  The largest and oldest professional association for psychologists, the American Psychological Association (APA), has well over 150,000 members and affiliates (American Psychological Association, 2004). The American Psychological Society (APS) was formed just a few years ago to give a stronger voice to academic and research psychologists. Although the APS is a much smaller organization, it has won wide respect; many psychologists belong both to the APA and to the APS.

These groups have student memberships that include nearly all privileges at a fraction of full membership costs. If you are thinking of majoring in psychology, ask your instructor for information about student membership in a professional psychology association. Also consider attending a state, regional, or national convention to get a better view of what psychologists are really like. These conventions also offer an opportunity for students to present their own research. You could do so, too.

Consider, also, joining a student psychology group, if your school has one. If none is available, you may be able to organize a psychology club or a chapter of a national honorary society, such as Psi Beta (at a two-year college) or Psi Chi (at a four-year college or university).

Psychology-Related Journals and Magazines  Professional groups sponsor newsletters or journals that help keep their members abreast of new developments in the field. Psychology majors should begin looking over a few of the main ones every month. Some publish general-interest articles, while others contain highly technical reports tailored for those with specialized knowledge.

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**TABLE 1.3**  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:

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

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.
advanced training. We suggest taking your first plunge into the psychological literature with one or more of these:

- *Monitor on Psychology*—the monthly news magazine of the APA
- *Current Directions in Psychological Science*—a semimonthly APS journal that provides short reviews on trends and controversies in all areas of psychology
- *American Psychologist*—the flagship journal of the APA
- *Psychological Science*—the premiere journal of the APS

In addition, there are several popular magazines in which you may find psychological articles of interest:

- *Discover*—a science magazine written for the general public
- *Scientific American*—another general-interest science magazine
- *Science News*—a weekly magazine consisting of brief blurbs on breaking news in all areas of science, including psychology
- *The Skeptical Inquirer*—a take-no-prisoners, pseudoscience-bashing magazine published by CSICOP, the Committee for the Scientific Investigation of Claims of the Paranormal

Don’t feel that you must keep up on the entire psychological literature. Nobody can. Read what interests you in these publications.

**Electronic Resources in Psychology** The printed psychological literature is vast and growing quickly. As a result, anyone wanting to find out what is known on a special topic must know how to access the information on the Internet and in an electronic database. There are several general databases available, such as Expanded Academic Index and Ebsco Academic Search Elite. The best electronic resource specifically for psychology is PsychInfo, an online computer database offered by the American Psychological Association. Most such resources require a paid subscription, although they may be available through your campus library.

In addition, a huge amount of free information about psychology is available on the Internet. A good place to start looking would be the American Psychological Association’s home page on the World Wide Web at http://www.apa.org or the American Psychological Society’s home page at http://www.psychologicalscience.org. Remember that web addresses often change. Remember, also, that anyone can put anything on the Internet, so be skeptical!

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**CHECK YOUR UNDERSTANDING**

1. **RECALL:** A theory is
   a. an unsupported opinion.
   b. a testable explanation for the data.
   c. the opposite of a fact.
   d. a statement that has not yet been supported with facts.

2. **RECALL:** A scientific study should begin with
   a. a controlled test.
   b. a hypothesis.
   c. data collection.
   d. risk/gain assessment.

3. **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

4. **ANALYSIS:** The conditions involving the independent variable could also be thought of as
USING PSYCHOLOGY TO LEARN PSYCHOLOGY

Studying with Key Questions and Core Concepts

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) of every chapter. To do so, we have built in many learning devices. Among the most important are the Key Questions and the Core Concepts. Let us show you how using these features can make your study of psychology easier.

The Key Questions, which take the place of the familiar section headings in each chapter, give you a “heads up” by signaling what to watch for as you read. For example, one of the Key Questions from this chapter asked, “What are the perspectives psychologists use today?” It alerted you to the idea that psychologists have some special ways of looking at mind and behavior that are different from those used in the past. You are much more likely to remember these new concepts if you approach them with an appropriate question in mind (Bransford et al., 1986; Brown & Campione, 1986; Glaser, 1984). 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.

Another good way to use the Core Concepts is to see if you can explain how the terms in boldface link
CHAPTER SUMMARY

- **WHAT IS PSYCHOLOGY—AND WHAT IS IT NOT?**
  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.

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

- **WHAT ARE PSYCHOLOGY’S HISTORICAL ROOTS?**
  Psychology has its roots in several often-conflicting traditions stretching back to the ancient Greeks. René Descartes helped the study of the mind to become scientific, based on his insight that sensations and behaviors are linked to activity in the nervous system. The formal beginning of psychology as a science is traced to the establishment by Wundt of the first psychological laboratory in 1879. Wundt’s 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. Psychoanalysis differed from the other schools of psychology by emphasizing the unconscious, while behaviorism staked its uniqueness on a rejection of introspection.

- **Modern psychology developed from several conflicting traditions, including structuralism, functionalism, Gestalt psychology, behaviorism, and psychoanalysis.**

- **WHAT ARE THE PERSPECTIVES PSYCHOLOGISTS USE TODAY?**
  Modern psychology has seven main viewpoints. The biological view looks for the causes of behavior in physical processes such as brain function and genetics. Using cutting-edge technology, neuroscientists using this perspective have made many discoveries about brain function. Many biological psychologists take an evolutionary approach, assuming that human behavior and mental processes are based on genetic adaptations for survival and reproductive advantage. This approach has developed influential theories that explain gender differences and aggressive behavior. The developmental view calls attention to mental and behavioral changes that occur throughout the lifespan. Such changes result from the interaction of heredity and environment. The cognitive view emphasizes information processing; it has made many discoveries about learning, memory, sensation, perception, language, and thinking. Cognitive neuroscientists are especially interested in the link between the brain and mental processes. The clinical view focuses on mental health and mental disorder. One clinical variation, known as psychodynamic psychology, pioneered by Sigmund Freud, proposes that behavior and thought are influenced by inner, often unconscious, psychological forces and conflicts. Its impact has been greatest in therapy. A competing clinical approach, called humanistic psychology, characterizes human functioning as motivated by a desire to grow, be productive, and fulfill human potential. Both have influenced our understanding of personality and the practice of psychotherapy. The behavioral view rejects mentalistic explanations and explains behavior in terms of observable stimuli and responses. It has given us powerful insights into the nature of learning. The trait view emphasizes enduring personality characteristics, and it is popular among applied psychologists involved in mental testing and

Only the behaviorists, among the historical schools in psychology, refused to use introspection because it was subjective.

Together, 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.
clinical work. The sociocultural view recognizes the power of society and cultural context on individual thought, feeling, and action, notably through social learning. Cross-cultural psychologists, who take a sociocultural perspective, are working to incorporate information about other cultures into a field that has historically been dominated by psychologists from Europe and the United States.

- Seven main perspectives characterize modern psychology: the biological, developmental, cognitive, clinical, behavioral, trait, and sociocultural views.

- **HOW DO PSYCHOLOGISTS DEVELOP NEW KNOWLEDGE?**

  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, as well as confounding variables. One way that scientists control for bias in their studies involves the double-blind control method.

  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.

- Psychologists, like researchers in all other sciences, use the scientific method to test their ideas empirically.

**REVIEW TEST**

For each of the following items, choose the single best answer. The answer key appears at the end.

1. Psychology’s scientific origins are usually traced to the late 19th century, when ______ established the first psychological laboratory.
   a. William James
   b. Wilhelm Wundt
   c. Sigmund Freud
   d. John B. Watson

2. "To understand consciousness or behavior, you must focus on the probable purpose of an action or process." This statement reflects the arguments of
   a. humanism.
   b. functionalism.
   c. structuralism.
   d. behaviorism.

3. According to the ______ approach, which is a variation of the ______ view, a person’s behavior and personality develop as a result of unconscious inner tensions and conflicts.
   a. evolutionary/biological
   b. introspective/cognitive
   c. psychodynamic/clinical
   d. structuralist/behavioral

4. Which of psychology’s seven perspectives says that psychology should *not* study mental processes, such as sensation, perception, memory, thinking, motivation, and emotion?
   a. biological
   b. cognitive
   c. clinical
   d. behavioral

5. According to the evolutionary approach in modern psychology, human behavior is the result of the natural selection of behaviors that promote
   a. cultural conformity.
   b. ability to process information.
   c. survival and reproduction.
   d. conflict between individual goals and societal limits.

6. All of the following areas are applied psychology specialties, except
   a. cognitive psychology.
   b. counseling psychology.
   c. clinical psychology.
   d. school psychology.

7. Scientific psychology employs empirical investigation methods. This means that the data collected must be based on
   a. firsthand sensory evidence.
   b. logic.
   c. the observer’s subjective interpretation of events.
   d. established traditions of philosophical inquiry.

8. To study the effects of childhood abuse on adult adjustment patterns, you would do
   a. an experimental study.
   b. a correlational study.
   c. a double-blind study.
   d. an evolutionary study.
9. In psychological research, a ______ is a relationship between the events or variables being studied.
   a. model
   b. dependent variable
   c. hypothesis
   d. correlation

10. A researcher wonders how to stimulate young schoolchildren to be more creative. She randomly divides a class of first graders in half, reading stories to one group and having members of the other group take turns making up stories to go with the same set of titles. After two weeks, those who made up stories are producing more work in their reading, writing, and art classes than those who merely listened as she read stories to them. Which one of the following statements is not true about this study?
   a. The experimental group was the group that made up their own stories.
   b. The dependent variable involves the amount of work produced by the two groups of children.
   c. There are two levels or conditions in the independent variable.
   d. This is an example of a case study.
ARTICLE

BOOKS
Burr, C. (2004). *The emperor of scent: A true story of perfume and obsession*. New York: Random House. We know least about our most ancient sense. Yet, in this true story, when a likable scientist claims he has discovered the true inner workings of the sense of smell, he is dismissed by peers, must struggle to publish his findings in *Nature*, and next meets with resistance from the fragrance industry. This book is an expose of scientific publication as well as an exploration of the olfactory sense.


Pinker, S. (2003). *The blank slate: The modern denial of human nature*. New York: Viking. Steven Pinker, MIT psychology professor and author of *How the Mind Works* and *The Language Instinct*, uses wit, poetry, and comedy to argue against the notion that the human infant’s brain is a “blank slate” at birth, insisting rather than evolution provides strong, inherited, survival-oriented skills—with ample room for shaping by culture and experience.


Schick, T., Jr., & Vaughn, L. (1999). *How to think about weird things*, 2nd ed. Mountain View, CA: Mayfield. Become a “critical consumer” of science by distinguishing good research from bad and keeping an open mind while maintaining high standards in explaining baffling behavior and phenomena such as astrology, ESP, creationism, channeling, and near-death experiences.

VIDEO
Fast, cheap, and out of control. (1997, color, 82 min). Directed by Errol Morris; starring Dave Hoover, George Mendonca, Ray Mendez, and Rodney Books. This documentary has interviews with four eccentric “geniuses”—a lion tamer, a topiary gardener, an expert on the African naked mole rat, and an MIT robotics scientist—mixed with B-movie footage and running commentary on life and human nature.
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

KEY TERMS AND PEOPLE

As you watch the programs, pay particular attention to these terms and people in addition to those covered in your textbook.

- **Burnout**  A work-related condition in which stress, lack of support, and negative self-evaluation disrupt performance and well-being.
- **ERP (Event-related potentials)**  Variations in brain waves as recorded by the electroencephalograph (EEG) that are triggered by specific internal or external events.
- **Field study**  Research carried on outside the laboratory where naturally occurring, ongoing behavior can be observed.
- **Heisenberg indeterminacy principle**  Principle stating that our impressions of other people are distorted by how we observe and assess them.
- **Subjective reality**  The perceptions and beliefs that we accept without question.
- **Mahzarin Banaji**  Uses indirect measures of reaction time and brain activity to study prejudice.
- **Daryl Bem**  Psychologist who illustrated the importance of critical thinking in scientific experiments.
- **Emanuel Donchin**  Discovered that brains measure surprise before we are aware of it.
- **Jerome Frank**  Psychiatrist who studies the common features of miracle cures and healings, political and religious conversions, and psychotherapy.
- **G. Stanley Hall**  Founded the first American psychology lab in 1883.
- **Christina Maslach**  Uses psychometric research to study job burnout.
- **Liz Phelps**  Collaborates with M. Banaji in conducting brain-based studies of prejudice.
- **Robert Rosenthal**  Showed that body language can reflect what we think and feel.
- **Leonard Saxe**  Studies the use and misuse of polygraphs to detect lying.

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.