CHAPTER 1

Introduction to Psychology
Key Concepts for Chapter 1

What is the science of psychology? ● What are the major specialties in the field of psychology? ● Where do psychologists work?

What are the origins of psychology? ● What are the major approaches in contemporary psychology? ● What are psychology’s key issues and controversies? ● What is the future of psychology likely to hold?

What is the scientific method? ● What role do theories and hypotheses play in psychological research? ● What research methods do psychologists use? ● How do psychologists establish cause-and-effect relationships using experiments?

What major issues confront psychologists conducting research?

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Prologue  Deepwater Disaster

One of the greatest environmental accidents in history began with a fire and explosion on an oil rig in the Gulf of Mexico. Eleven men were killed immediately, and dozens were injured. But the aftermath will extend for decades.

When the Deepwater Horizon oil rig blew up in the spring of 2010, tens of thousands of barrels of oil escaped from pipes that had been drilled deep into the ocean floor. Scientists debated for days about how to stop the uncontrolled flow of oil. After a number of failed attempts to stop the oil, engineers finally placed a containment cap over the cascading oil, and relief wells were drilled that eventually stopped the gushing oil.

But the damage had been done. Large expanses of water were covered with oil, and there were plumes of oil underneath the seas. Beaches and fragile marshlands along the coast were ruined, and animals, coated with oil, died above and below the waters. Tens of thousands of people lost their livelihoods. It will be decades before life returns to normal.

Looking Ahead

Although the oil spill in the Gulf originated as an environmental accident, it also gave rise to a host of important psychological issues. Consider, for example, these questions:

- What biological reactions did the workers experience as they responded to the initial explosion on the rig?
- How did scientists and engineers devise solutions to stop the gushing oil?
- What would be the long-term effects of the health of individuals whose livelihoods were wiped out?
- How did the anger and frustration that people experienced as they watched the disaster unfold affect their behavior?
- How did the families of those killed in the disaster react and cope with their grief?
- What explains why many people came to the Gulf region to help save oil-soaked animals and clean up the beaches?
Psychology is the scientific study of behavior and mental processes. The simplicity of this definition is in some ways deceiving, concealing ongoing debates about how broad the scope of psychology should be. Should psychologists limit themselves to the study of outward, observable behavior? Is it possible to study thinking scientifically? Should the field encompass the study of such diverse topics as physical and mental health, perception, dreaming, and motivation? Is it appropriate to focus solely on human behavior, or should the behavior of other species be included?

Most psychologists would argue that the field should be receptive to a variety of viewpoints and approaches. Consequently, the phrase behavior and mental processes in the definition of psychology must be understood to mean many things: It encompasses not just what people do but also their thoughts, emotions, perceptions, reasoning processes, memories, and even the biological activities that maintain bodily functioning.

Psychologists try to describe, predict, and explain human behavior and mental processes, as well as helping to change and improve the lives of people and the world in which they live. They use scientific methods to find answers that are far more valid and legitimate than those resulting from intuition and speculation, which are often inaccurate (see Figure 1).

**Psychological Truths?**
To test your knowledge of psychology, try answering the following questions:

1. Infants love their mothers primarily because their mothers fulfill their basic biological needs, such as providing food. True or false?  
2. Geniuses generally have poor social adjustment. True or false?  
3. The best way to ensure that a desired behavior will continue after training is completed is to reward that behavior every single time it occurs during training rather than rewarding it only periodically. True or false?  
4. People with schizophrenia have at least two distinct personalities. True or false?  
5. Parents should do everything they can to ensure their children have high self-esteem and a strong sense that they are highly competent. True or false?  
6. Children’s IQ scores have little to do with how well they do in school. True or false?  
7. Frequent masturbation can lead to mental illness. True or false?  
8. Once people reach old age, their leisure activities change radically. True or false?  
9. Most people would refuse to give painful electric shocks to other people. True or false?  
10. People who talk about suicide are unlikely to actually try to kill themselves. True or false?  

**Scoring:** The truth about each of these items: They are all false. Based on psychological research, each of these “facts” has been proven untrue. You will learn the reasons why as we explore what psychologists have discovered about human behavior.

**Key Concepts**

**What is the science of psychology?**

**What are the major specialties in the field of psychology?**

**Where do psychologists work?**

**FIGURE 1** The scientific method is the basis of all psychological research and is used to find valid answers. Test your knowledge of psychology by answering these questions. (Source: Adapted from Lamal, 1979.)
The questions in Figure 1 provide just a hint of the topics that we will encounter in the study of psychology. Our discussions will take us through the range of what is known about behavior and mental processes.

The Subfields of Psychology: Psychology’s Family Tree

As the study of psychology has grown, it has given rise to a number of subfields (described in Figure 2). The subfields of psychology can be likened to an extended family, with assorted nieces and nephews, aunts and uncles, and cousins who, although they may not interact on a day-to-day basis, are related to one another, because they share a common goal: understanding behavior. One way to identify the key subfields is to look at some of the basic questions about behavior that they address.

WHAT ARE THE BIOLOGICAL FOUNDATIONS OF BEHAVIOR?

In the most fundamental sense, people are biological organisms. Behavioral neuroscience is the subfield of psychology that mainly examines how the brain and the nervous system—but other biological processes as well—determine behavior. Thus, neuroscientists consider how our bodies influence our behavior. For example, they may examine the link between specific sites in the brain and the muscular tremors of people affected by Parkinson’s disease or attempt to determine how our emotions are related to physical sensations. Behavioral neuroscientists might want to know what physiological changes occurred as oil from the damaged well began coming ashore (Willis, 2008).

HOW DO PEOPLE SENSE, PERCEIVE, LEARN, AND THINK ABOUT THE WORLD?

If you have ever wondered why you are susceptible to optical illusions, how your body registers pain, or how to make the most of your study time, an experimental psychologist can answer your questions. Experimental psychology is the branch of psychology that studies the processes of sensing, perceiving, learning, and thinking about the world. (The term experimental psychologist is somewhat misleading: Psychologists in every specialty area use experimental techniques.)

Several subspecialties of experimental psychology have become specialties in their own right. One is cognitive psychology, which focuses on higher mental processes, including thinking, memory, reasoning, problem solving, judging, decision making, and language. For example, a cognitive psychologist might be interested in what the survivors of the downed flight remembered about their experience.

WHAT ARE THE SOURCES OF CHANGE AND STABILITY IN BEHAVIOR ACROSS THE LIFE SPAN?

A baby producing her first smile . . . taking his first step . . . saying its first word. These universal milestones in development are also singularly special and unique for each person. Developmental psychology studies how people grow and change from the moment of conception through death. Personality psychology focuses on the consistency in people’s behavior over time and the traits that differentiate one person from another.
<table>
<thead>
<tr>
<th>Subfield</th>
<th>Description</th>
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<tbody>
<tr>
<td>Behavioral genetics</td>
<td>Behavioral genetics studies the inheritance of traits related to behavior.</td>
</tr>
<tr>
<td>Behavioral neuroscience</td>
<td>Behavioral neuroscience examines the biological basis of behavior.</td>
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<tr>
<td>Clinical psychology</td>
<td>Clinical psychology deals with the study, diagnosis, and treatment of</td>
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<td></td>
<td>psychological disorders.</td>
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<tr>
<td>Clinical neuropsychology</td>
<td>Clinical neuropsychology unites the areas of biopsychology and clinical</td>
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<tr>
<td></td>
<td>psychology, focusing on the relationship between biological factors and</td>
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<tr>
<td></td>
<td>psychological disorders.</td>
</tr>
<tr>
<td>Cognitive psychology</td>
<td>Cognitive psychology focuses on the study of higher mental processes.</td>
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<td>Counseling psychology</td>
<td>Counseling psychology focuses primarily on educational, social, and</td>
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<td>career adjustment problems.</td>
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<td>Cross-cultural psychology</td>
<td>Cross-cultural psychology investigates the similarities and differences in</td>
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<td>psychological functioning in and across various cultures and ethnic groups.</td>
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<tr>
<td>Developmental psychology</td>
<td>Developmental psychology examines how people grow and change from the</td>
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<td></td>
<td>moment of conception through death.</td>
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<td>Educational psychology</td>
<td>Educational psychology is concerned with teaching and learning processes,</td>
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<td>such as the relationship between motivation and school performance.</td>
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<td>Environmental psychology</td>
<td>Environmental psychology considers the relationship between people and</td>
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<td>their physical environment.</td>
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<td>Evolutionary psychology</td>
<td>Evolutionary psychology considers how behavior is influenced by our genetic</td>
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<td>inheritance from our ancestors.</td>
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<tr>
<td>Experimental psychology</td>
<td>Experimental psychology studies the processes of sensing, perceiving,</td>
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<td></td>
<td>learning, and thinking about the world.</td>
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<td>Forensic psychology</td>
<td>Forensic psychology focuses on legal issues, such as determining the</td>
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<td>accuracy of witness memories.</td>
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<td>Health psychology</td>
<td>Health psychology explores the relationship between psychological factors</td>
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<td></td>
<td>and physical ailments or disease.</td>
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<td>Industrial/organizational psychology</td>
<td>Industrial/organizational psychology is concerned with the psychology of the workplace.</td>
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<tr>
<td>Personality psychology</td>
<td>Personality psychology focuses on the consistency in people’s behavior over</td>
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<td></td>
<td>time and the traits that differentiate one person from another.</td>
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<td>Program evaluation</td>
<td>Program evaluation focuses on assessing large-scale programs, such as the</td>
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<td>Head Start preschool program, to determine whether they are effective in</td>
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<td></td>
<td>meeting their goals.</td>
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<tr>
<td>Psychology of women</td>
<td>Psychology of women focuses on issues such as discrimination against</td>
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<td></td>
<td>women and the causes of violence against women.</td>
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<tr>
<td>School psychology</td>
<td>School psychology is devoted to counseling children in elementary and</td>
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<td></td>
<td>secondary schools who have academic or emotional problems.</td>
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<tr>
<td>Social psychology</td>
<td>Social psychology is the study of how people’s thoughts, feelings, and</td>
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<td></td>
<td>actions are affected by others.</td>
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<tr>
<td>Sport psychology</td>
<td>Sport psychology applies psychology to athletic activity and exercise.</td>
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</table>

**FIGURE 2** The major subfields of psychology.
**Chapter 1 Introduction to Psychology**

**HOW DO PSYCHOLOGICAL FACTORS AFFECT PHYSICAL AND MENTAL HEALTH?**

Frequent depression, stress, and fears that prevent people from carrying out their normal activities are topics that would interest a health psychologist, a clinical psychologist, and a counseling psychologist. Health psychology explores the relationship between psychological factors and physical ailments or disease. For example, health psychologists are interested in assessing how long-term stress (a psychological factor) can affect physical health and in identifying ways to promote behavior that brings about good health (Belar, 2008; Yardley & Moss-Morris, 2009).

Clinical psychology deals with the study, diagnosis, and treatment of psychological disorders. Clinical psychologists are trained to diagnose and treat problems that range from the crises of everyday life, such as unhappiness over the breakup of a relationship, to more extreme conditions, such as profound, lingering depression. Some clinical psychologists also research and investigate issues that vary from identifying the early signs of psychological disturbance to studying the relationship between family communication patterns and psychological disorders.

Like clinical psychologists, counseling psychologists deal with people’s psychological problems, but the problems they deal with are more specific. Counseling psychology focuses primarily on educational, social, and career adjustment problems. Almost every college has a center staffed with counseling psychologists. This is where students can get advice on the kinds of jobs they might be best suited for, on methods of studying effectively, and on strategies for resolving everyday difficulties, such as problems with roommates and concerns about a specific professor’s grading practices. Many large business organizations also employ counseling psychologists to help employees with work-related problems.

**HOW DO OUR SOCIAL NETWORKS AFFECT BEHAVIOR?**

Our complex networks of social interrelationships are the focus for many subfields of psychology. For example, social psychology is the study of how people’s thoughts, feelings, and actions are affected by others. Social psychologists concentrate on such diverse topics as human aggression, liking and loving, persuasion, and conformity.

Cross-cultural psychology investigates the similarities and differences in psychological functioning in and across various cultures and ethnic groups. For example, cross-cultural psychologists examine how cultures differ in their use of punishment during child rearing.

**EXPANDING PSYCHOLOGY’S FRONTIERS**

The boundaries of the science of psychology are constantly growing. Three newer members of the field’s family tree—evolutionary psychology, behavioral genetics, and clinical neuropsychology—have sparked particular excitement, and debate, within psychology.

Evolutionary Psychology Evolutionary psychology considers how behavior is influenced by our genetic inheritance from our ancestors. The evolutionary approach suggests that the chemical coding of information in our cells not only determines traits such as hair color and race but also holds the key to understanding a broad variety of behaviors that helped our ancestors survive and reproduce.

Evolutionary psychology stems from Charles Darwin’s arguments in his groundbreaking 1859 book, *On the Origin of Species*. Darwin suggested that a process of natural selection leads to the survival of the fittest and the development of traits that enable a species to adapt to its environment.
Evolutionary psychologists take Darwin’s arguments a step further. They argue that our genetic inheritance determines not only physical traits such as skin and eye color but certain personality traits and social behaviors as well. For example, evolutionary psychologists suggest that behavior such as shyness, jealousy, and cross-cultural similarities in qualities desired in potential mates are at least partially determined by genetics, presumably because such behavior helped increase the survival rate of humans’ ancient relatives (Buss, 2003; Sefcek, Brumbach, & Vasquez, 2007).

Although they are increasingly popular, evolutionary explanations of behavior have stirred controversy. By suggesting that many significant behaviors unfold automatically, because they are wired into the human species, evolutionary approaches minimize the role of environmental and social forces. Still, the evolutionary approach has stimulated a significant amount of research on how our biological inheritance influences our traits and behaviors (Begley, 2005; Buss, 2004; Neher, 2006).

Behavioral Genetics Another rapidly growing area in psychology focuses on the biological mechanisms, such as genes and chromosomes, that enable inherited behavior to unfold. Behavioral genetics seeks to understand how we might inherit certain behavioral traits and how the environment influences whether we actually display such traits (Bjorklund & Ellis, 2005; Moffitt & Caspi, 2007; Rende, 2007).

Clinical Neuropsychology Clinical neuropsychology unites the areas of neuroscience and clinical psychology: It focuses on the origin of psychological disorders in biological factors. Building on advances in our understanding of the structure and chemistry of the brain, this specialty has already led to promising new treatments for psychological disorders as well as debates over the use of medication to control behavior (Boake, 2008).

Working at Psychology

Help Wanted: Assistant professor at a small liberal arts college. Teach undergraduate courses in introductory psychology and courses in specialty areas of cognitive psychology, perception, and learning. Strong commitment to quality teaching, as well as evidence of scholarship and research productivity, necessary.

Help Wanted: Industrial-organizational consulting psychologist. International firm seeks psychologists for full-time career positions as consultants to management. Candidates must have the ability to establish a rapport with senior business executives and help them find innovative and practical solutions to problems concerning people and organizations.

Help Wanted: Clinical psychologist. PhD, internship experience, and license required. Comprehensive clinic seeks psychologist to work with children and adults providing individual and group therapy, psychological evaluations, crisis intervention, and development of behavior treatment plans on multidisciplinary team.

As these job ads suggest, psychologists are employed in a variety of settings. Many doctoral-level psychologists are employed by institutions of higher learning (universities and colleges) or are self-employed, usually working as private practitioners treating clients (see Figure 3). Other work sites include hospitals, clinics, mental health centers, counseling centers, government human-services organizations, businesses, schools, and even prisons. Psychologists are employed in the military, working with soldiers, veterans, and their families, and they work for the federal government Department of Homeland Security, fighting terrorism (American Psychological Association, 2007; DeAngelis & Monahan, 2008).
Most psychologists, though, work in academic settings, allowing them to combine the three major roles played by psychologists in society: teacher, scientist, and clinical practitioner. Many psychology professors are also actively involved in research or in serving clients. Whatever the particular job site, however, psychologists share a commitment to improving individual lives as well as society in general.

Keep in mind that many professionals from a variety of professions use the findings of psychologists. As you can see in each PsychWork box here and throughout the text, we focus on how a non-psychologist uses psychology.

For Christin Poirier, psychology is central to her occupation as a social worker, a field dedicated to enhancing the well-being of individuals, families, groups, and communities. As a social worker, Poirier works at a community mental health center where she helps children and adolescents who are experiencing emotional or behavioral difficulties or both. Says Poirier, “The strategies I employ in counseling sessions are derived from basic psychological concepts and theories. In addition, in order to know what strategies are age-appropriate for a particular client, I need to consider their stage of psychological development. Finally, it is necessary to consider how culture and ethnicity affect clients, so I incorporate these aspects into my clients’ treatment plans.”

**PSYCHOLOGISTS: A PORTRAIT**

Although there is no “average” psychologist in terms of personal characteristics, we can draw a statistical portrait of the field. There are close to 300,000 psychologists working today in the United States, but they are outnumbered by psychologists in other countries. Europe has more than 290,000 psychologists, and in Brazil alone there are 140,000 licensed psychologists. Although most research is conducted in the United States, psychologists in other countries are increasingly influential in adding
to the knowledge base and practices of psychology (Nelson, 2007; Peiro & Lunt, 2003; Stevens & Gielen, 2007).

In the United States, women outnumber men in the field, a big change from earlier years when women faced bias and were actively discouraged from becoming psychologists. Today, around three-fourths of new psychology doctorate degrees are earned by women. There is an active debate about whether, and how, to seek balance in the percentage of men and women in the field (Cynkar, 2007; Frincke & Pate, 2004).

The vast majority of psychologists in the United States are white, limiting the diversity of the field. Only 6% of all psychologists are members of racial minority groups. Although the number of minority individuals entering the field is higher than a decade ago—around 20% of new master’s degrees and 16% of new doctorate degrees are awarded to people of color—the numbers have not kept up with the dramatic growth of the minority population at large (Hoffer et al., 2005; Maton et al., 2006).

The underrepresentation of racial and ethnic minorities among psychologists is significant for several reasons. First, the field of psychology is diminished by a lack of the diverse perspectives and talents that minority-group members can provide. Furthermore, minority-group psychologists serve as role models for members of minority communities, and their underrepresentation in the profession might deter other minority-group members from entering the field. Finally, because members of minority groups often prefer to receive psychological therapy from treatment providers of their own race or ethnic group, the rarity of minority psychologists can discourage some members of minority groups from seeking treatment (Bernal et al., 2002; Bryant et al., 2005; Jenkins et al., 2003).

THE EDUCATION OF A PSYCHOLOGIST

How do people become psychologists? The most common route is a long one. Most psychologists have a doctorate, either a PhD (doctor of philosophy) or, less frequently, a PsyD (doctor of psychology). The PhD is a research degree that requires a dissertation based on an original investigation. The PsyD is obtained by psychologists who wish to focus on the treatment of psychological disorders. (Psychologists are distinct from psychiatrists, who have a medical degree and specialize in the diagnosis and treatment of psychological disorders, often using treatments that involve the prescription of drugs.)

Both the PhD and the PsyD typically take four or five years of work past the bachelor’s level. Some fields of psychology involve education beyond the doctorate. For instance, doctoral-level clinical psychologists, who deal with people with psychological disorders, typically spend an additional year doing an internship.

About a third of people working in the field of psychology have a master’s degree as their highest degree, which they earn after two or three years of graduate work. These psychologists teach, provide therapy, conduct research, or work in specialized programs dealing with drug abuse or crisis intervention. Some work in universities, government, and business, collecting and analyzing data.

CAREERS FOR PSYCHOLOGY MAJORS

Although some psychology majors head for graduate school in psychology or an unrelated field, the majority join the workforce immediately after graduation. Most report that the jobs they take after graduation are related to their psychology background.

An undergraduate major in psychology provides excellent preparation for a variety of occupations. Because undergraduates who specialize in psychology develop good analytical skills, are trained to think critically, and are able to synthesize and evaluate information well, employers in business, industry, and the government value their preparation (Kuther, 2003).

The most common areas of employment for psychology majors are in the social services, including working as an administrator, serving as a counselor, and providing...
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Some 20% of recipients of bachelor’s degrees in psychology work in the social services or in some other form of public affairs. In addition, psychology majors often enter the fields of education or business or work for federal, state, and local governments (see Figure 4; American Psychological Association, 2000; Murray, 2002).
RECAP/EVALUATE/RETHINK

RECAP

What is the science of psychology?
- Psychology is the scientific study of behavior and mental processes, encompassing not just what people do but also their biological activities, feelings, perceptions, memory, reasoning, and thoughts. (p. 5)

What are the major specialties in the field of psychology?
- Behavioral neuroscientists focus on the biological basis of behavior, and experimental psychologists study the processes of sensing, perceiving, learning, and thinking about the world. (p. 6)
- Cognitive psychology, an outgrowth of experimental psychology, studies higher mental processes, including memory, knowing, thinking, reasoning, problem solving, judging, decision making, and language. (p. 6)
- Developmental psychologists study how people grow and change throughout the life span. (p. 6)
- Personality psychologists consider the consistency and change in an individual’s behavior, as well as the individual differences that distinguish one person’s behavior from another’s. (p. 6)
- Health psychologists study psychological factors that affect physical disease, whereas clinical psychologists consider the study, diagnosis, and treatment of abnormal behavior. Counseling psychologists focus on educational, social, and career adjustment problems. (p. 8)
- Social psychology is the study of how people’s thoughts, feelings, and actions are affected by others. (p. 8)
- Cross-cultural psychology examines the similarities and differences in psychological functioning among various cultures. (p. 8)
- Other increasingly important fields are evolutionary psychology, behavioral genetics, and clinical neuropsychology. (p. 8)

Where do psychologists work?
- Psychologists are employed in a variety of settings. Although the primary sites of employment are private practice and colleges, many psychologists are found in hospitals, clinics, community mental health centers, and counseling centers. (p. 9)

EVALUATE

Match each subfield of psychology with the issues or questions posed below.

a. behavioral neuroscience  
b. experimental psychology  
c. cognitive psychology  
d. developmental psychology  
e. personality psychology  
f. health psychology  
g. clinical psychology  
h. counseling psychology  
i. educational psychology  
j. school psychology  
k. social psychology  
l. industrial psychology

1. Joan, a college freshman, is worried about her grades. She needs to learn better organizational skills and study habits to cope with the demands of college.
2. At what age do children generally begin to acquire an emotional attachment to their fathers?
3. It is thought that pornographic films that depict violence against women may prompt aggressive behavior in some men.
4. What chemicals are released in the human body as a result of a stressful event? What are their effects on behavior?
5. Luis is unique in his manner of responding to crisis situations, with an even temperament and a positive outlook.
6. The teachers of 8-year-old Jack are concerned that he has recently begun to withdraw socially and to show little interest in schoolwork.
7. Janetta’s job is demanding and stressful. She wonders if her lifestyle is making her more prone to certain illnesses, such as cancer and heart disease.
8. A psychologist is intrigued by the fact that some people are much more sensitive to painful stimuli than others are.
9. A strong fear of crowds leads a young man to seek treatment for his problem.
10. What mental strategies are involved in solving complex word problems?
11. What teaching methods most effectively motivate elementary school students to successfully accomplish academic tasks?
12. Jessica is asked to develop a management strategy that will encourage safer work practices in an assembly plant.
RETHINK

1. Do you think intuition and common sense are sufficient for understanding why people act the way they do? In what ways is a scientific approach appropriate for studying human behavior?

2. From an educator’s perspective: Suppose you are a teacher who has a 7-year-old child in your class who is having unusual difficulty learning to read. Imagine that you could consult as many psychologists with different specialties as you wanted. What are the different types of psychologists that you might approach to address the problem?

Answers to Evaluate Questions

**KEY TERM**

psychology p. 5
Seven thousand years ago, people assumed that psychological problems were caused by evil spirits. To allow those spirits to escape from a person’s body, ancient healers chipped a hole in a patient’s skull with crude instruments—a procedure called trephining.

According to the 17th-century philosopher Descartes, nerves were hollow tubes through which “animal spirits” conducted impulses in the same way that water is transmitted through a pipe. So when a person got too close to a fire, heat was transmitted to the brain through the tubes.

Franz Josef Gall, an 18th-century physician, argued that a trained observer could discern intelligence, moral character, and other basic personality characteristics from the shape and number of bumps on a person’s skull. His theory gave rise to the field of phrenology, employed by hundreds of practitioners in the 19th century.

Although these explanations might sound far-fetched, in their own times they represented the most advanced thinking about what might be called the psychology of the era. Our understanding of behavior has progressed tremendously since the 18th century, but most of the advances have been recent. As sciences go, psychology is one of the new kids on the block. (For highlights in the development of the field, see Figure 1 on page 16.)

The Roots of Psychology

We can trace psychology’s roots back to the ancient Greeks, who considered the mind a suitable topic for scholarly contemplation. Later philosophers argued for hundreds of years about some of the questions psychologists still grapple with today. For example, the 17th-century British philosopher John Locke believed that children were born into the world with minds like “blank slates” (tabula rasa in Latin) and that their experiences determined what kind of adults they would become. His views contrasted with those of Plato and the 17th-century French philosopher René Descartes, who argued that some knowledge was inborn in humans.

However, the formal beginning of psychology as a scientific discipline is generally considered to be in the late 19th century when, in Leipzig, Germany, Wilhelm Wundt established the first experimental laboratory devoted to psychological phenomena. At about the same time, William James was setting up his laboratory in Cambridge, Massachusetts.

When Wundt set up his laboratory in 1879, his aim was to study the building blocks of the mind. He considered psychology to be the study of conscious experience. His perspective, which came to be known as structuralism, focused on uncovering the fundamental mental components of perception, consciousness, thinking, emotions, and other kinds of mental states and activities.

To determine how basic sensory processes shape our understanding of the world, Wundt and other structuralists used a procedure called introspection, in which they
presented people with a stimulus—such as a bright green object or a sentence printed on a card—and asked them to describe, in their own words and in as much detail as they could, what they were experiencing. Wundt argued that by analyzing their replies, psychologists could come to a better understanding of the structure of the mind.

Over time, psychologists challenged Wundt’s approach. They became increasingly dissatisfied with the assumption that introspection could reveal the structure of the mind. Because there were few ways an outside observer could confirm the accuracy of others’ introspections, introspection was not a truly scientific technique, they argued. Moreover, people had difficulty describing some kinds of inner experiences, such as emotional responses. Those drawbacks led to the development of new approaches that largely replaced structuralism.

The perspective that replaced structuralism is known as functionalism. Rather than focusing on the mind’s structure, functionalism concentrated on what the mind does and how behavior functions. Functionalists, whose perspective became prominent in the early 1900s, asked what role behavior plays in helping people adapt to their environments. For example, a functionalist might examine the function of the emotion of fear in preparing us to deal with emergency situations.

Led by the American psychologist William James, the functionalists examined how behavior enables people to satisfy their needs and how our “stream of consciousness”

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**FIGURE 1** This time line illustrates major milestones in the development of psychology.

**Forerunners of Psychology**
- 5,000 BCE: Trephining used to allow the escape of evil spirits
- 430 BCE: Hippocrates argues for four temperaments of personality
- 1690: John Locke introduces idea of tabula rasa
- 1637: Descartes describes animal spirits
- 1687: René Descartes proposes the concept of Cartesian dualism
- 1800: Charles Babbage proposes the concept of the difference engine
- 1807: Franz Josef Gall proposes phrenology
- 1879: Wilhelm Wundt inaugurates first psychology laboratory in Leipzig, Germany
- 1905: Mary Calkins works on memory
- 1890: Principles of Psychology published by William James
- 1895: Functional model formulated
- 1900: Sigmund Freud develops the psychodynamic perspective
- 1904: Ivan Pavlov wins Nobel Prize for work on digestion that led to fundamental principles of learning
- 1920: Gestalt psychology becomes influential

**First Psychologists**
- 1800: First psychologists
- 1840: Charcot and Janet develop the concept of hypnotism
- 1879: Wilhelm Wundt inaugurates first psychology laboratory in Leipzig, Germany
- 1890: Principles of Psychology published by William James
- 1895: Functional model formulated
- 1900: Sigmund Freud develops the psychodynamic perspective
- 1904: Ivan Pavlov wins Nobel Prize for work on digestion that led to fundamental principles of learning
- 1920: Gestalt psychology becomes influential
thinking permits us to adapt to our environment. The American educator John Dewey drew on functionalism to develop the field of school psychology, proposing ways to best meet students' educational needs.

Another important reaction to structuralism was the development of gestalt psychology in the early 1900s. **Gestalt psychology** emphasizes how perception is organized. Instead of considering the individual parts that make up thinking, gestalt psychologists took the opposite tack, studying how people consider individual elements together as units or wholes. Led by German scientists such as Hermann Ebbinghaus and Max Wertheimer, gestalt psychologists proposed that “The whole is different from the sum of its parts,” meaning that our perception (or understanding) of objects is greater and more meaningful than the individual elements that make up our perceptions. Gestalt psychologists have made substantial contributions to our understanding of perception.

**WOMEN IN PSYCHOLOGY: FOUNDING MOTHERS**

As in many scientific fields, social prejudices hindered women’s participation in the early development of psychology. For example, many universities would not even admit women to their graduate psychology programs in the early 1900s.

**gestalt** (geh SHTALTL)

**psychology** An approach to psychology that focuses on the organization of perception and thinking in a “whole” sense rather than on the individual elements of perception.

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**Study Alert**

Knowing the basic outlines of the history of the field will help you understand how today’s major perspectives have evolved.
Despite the hurdles they faced, women made notable contributions to psychology, although their impact on the field was largely overlooked until recently. For example, Margaret Floy Washburn (1871–1939) was the first woman to receive a doctorate in psychology, and she did important work in animal behavior. Leta Stetter Hollingworth (1886–1939) was one of the first psychologists to focus on child development and on women’s issues. She collected data to refute the view popular in the early 1900s that women’s abilities periodically declined during certain phases of the menstrual cycle (Hollingworth, 1943/1990; Denmark & Fernandez, 1993; Furumoto & Scarborough, 2002).

Mary Calkins (1863–1930), who studied memory in the early part of the 20th century, became the first female president of the American Psychological Association. Karen Horney (pronounced “HORN-eye”) (1885–1952) focused on the social and cultural factors behind personality, and June Etta Downey (1875–1932) spearheaded the study of personality traits and became the first woman to head a psychology department at a state university. Anna Freud (1895–1982), the daughter of Sigmund Freud, also made notable contributions to the treatment of abnormal behavior, and Mamie Phipps Clark (1917–1983) carried out pioneering work on how children of color grew to recognize racial differences (Horney, 1937; Stevens & Gardner, 1982; Lal, 2002).

Today’s Perspectives

The men and women who laid the foundations of psychology shared a common goal: to explain and understand behavior using scientific methods. Seeking to achieve the same goal, the tens of thousands of psychologists who followed those early pioneers embraced—and often rejected—a variety of broad perspectives.

The perspectives of psychology offer distinct outlooks and emphasize different factors. Just as we can use more than one map to find our way around a particular region—for instance, a map that shows roads and highways and another map that shows major landmarks—psychologists developed a variety of approaches to understanding behavior. When considered jointly, the different perspectives provide a means to explain behavior in its amazing variety.

Today, the field of psychology includes five major perspectives (summarized in Figure 2). These broad perspectives emphasize different aspects of behavior and mental processes, and each takes our understanding of behavior in a somewhat different direction.

![Study Alert]
Use Figure 2 to differentiate the five perspectives. These are important because they provide a foundation for every topic covered throughout the text.

<table>
<thead>
<tr>
<th>Neuroscience</th>
<th>Psychodynamic</th>
<th>Behavioral</th>
<th>Cognitive</th>
<th>Humanistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views behavior from the perspective of biological functioning</td>
<td>Believes behavior is motivated by inner, unconscious forces over which a person has little control</td>
<td>Focuses on observable behavior</td>
<td>Examines how people understand and think about the world</td>
<td>Contends that people can control their behavior and that they naturally try to reach their full potential</td>
</tr>
</tbody>
</table>

**FIGURE 2** The major perspectives of psychology.
THE NEUROSCIENCE PERSPECTIVE: BLOOD, SWEAT, AND FEARS

When we get down to the basics, humans are animals made of skin and bones. The neuroscience perspective considers how people and nonhumans function biologically: how individual nerve cells are joined together, how the inheritance of certain characteristics from parents and other ancestors influences behavior, how the functioning of the body affects hopes and fears, which behaviors are instinctual, and so forth. Even more complex kinds of behaviors, such as a baby’s response to strangers, are viewed as having critical biological components by psychologists who embrace the neuroscience perspective. This perspective includes the study of heredity and evolution, which considers how heredity may influence behavior; and behavioral neuroscience, which examines how the brain and the nervous system affect behavior.

Because every behavior can be broken down ultimately into its biological components, the neuroscience perspective has broad appeal. Psychologists who subscribe to this perspective have made major contributions to the understanding and betterment of human life, ranging from cures for certain types of deafness to drug treatments for people with severe mental disorders. Furthermore, advances in methods for examining the anatomy and functioning of the brain have permitted the neuroscientific perspective to extend its influence across a broad range of subfields in psychology. (We’ll see examples of these methods throughout this book in Neuroscience and Life.)

THE PSYCHODYNAMIC PERSPECTIVE: UNDERSTANDING THE INNER PERSON

To many people who have never taken a psychology course, psychology begins and ends with the psychodynamic perspective. Proponents of the psychodynamic perspective argue that behavior is motivated by inner forces and conflicts about which we have little awareness or control. They view dreams and slips of the tongue as indications of what a person is truly feeling within a seething cauldron of unconscious psychic activity.

The origins of the psychodynamic view are linked to one person: Sigmund Freud. Freud was a Viennese physician in the early 1900s whose ideas about unconscious determinants of behavior had a revolutionary effect on 20th-century thinking, not just in psychology but in related fields as well. Although some original Freudian principles have been roundly criticized, the contemporary psychodynamic perspective provides a means not only to understand and treat some kinds of psychological disorders but also to understand everyday phenomena such as prejudice and aggression.

THE BEHAVIORAL PERSPECTIVE: OBSERVING THE OUTER PERSON

Whereas the neuroscience and psychodynamic approaches look inside the organism to determine the causes of its behavior, the behavioral perspective takes a very different approach. The behavioral perspective grew out of a rejection of psychology’s early emphasis on the inner workings of the mind. Instead, early behaviorists suggested that the field should focus on observable behavior that can be measured objectively.

John B. Watson was the first major American psychologist to advocate a behavioral approach. Working in the 1920s, Watson was adamant in his view that one could gain a complete understanding of behavior by studying and modifying the environment in which people operate.

In fact, Watson believed rather optimistically that it was possible to elicit any desired type of behavior by controlling a person’s environment. This philosophy is clear from his own words: “Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I’ll guarantee to take any one at random and train him to become any type of specialist I might select—doctor,
lawyer, artist, merchant-chief, and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors” (Watson, 1924).

The behavioral perspective was championed by B. F. Skinner, a pioneer in the field. A great deal of our understanding about how people learn new behaviors is based on the behavioral perspective. As we will see, the behavioral perspective crops up along every byway of psychology. Along with its influence in the area of learning processes, this perspective has made contributions in such diverse areas as treating mental disorders, curbing aggression, resolving sexual problems, and ending drug addiction (Silverman, Roll, & Higgins, 2008).

THE COGNITIVE PERSPECTIVE:
IDENTIFYING THE ROOTS OF UNDERSTANDING

Efforts to understand behavior led some psychologists straight into the mind. Evolving in part from structuralism and in part as a reaction to behaviorism, which focused so heavily on observable behavior and the environment, the cognitive perspective focuses on how people think, understand, and know about the world. Its emphasis is on learning how people comprehend and represent the outside world within themselves and how our ways of thinking about the world influence our behavior.

Many psychologists who adhere to the cognitive perspective compare human thinking to the workings of a computer that takes in information and transforms, stores, and retrieves it. In their view, thinking is information processing.

Psychologists who rely on the cognitive perspective ask questions ranging from how people make decisions to whether a person can watch television and study at the same time. Common elements that link cognitive approaches are an emphasis on how people understand and think about the world, and an interest in describing the patterns and irregularities in the operation of our minds.

THE HUMANISTIC PERSPECTIVE:
THE UNIQUE QUALITIES OF THE HUMAN SPECIES

Rejecting the view that behavior is determined largely by automatically unfolding biological forces, unconscious processes, or the environment, the humanistic perspective instead suggests that all individuals naturally strive to grow, develop, and be in control of their lives and behavior. Humanistic psychologists maintain that each of us has the capacity to seek and reach fulfillment.

According to Carl Rogers and Abraham Maslow, who were central figures in the development of the humanistic perspective, people will strive to reach their full potential when given the opportunity. The emphasis of the humanistic perspective is free will, the ability to freely make decisions about one’s own behavior and life. The notion of free will stands in contrast to determinism, which sees behavior as caused or determined by things beyond a person’s control.

The humanistic perspective assumes that people are able to make their own choices about their behavior rather than relying on societal standards. More than any other approach, it stresses the role of psychology in enriching people’s lives and helping them achieve self-fulfillment. By reminding psychologists of their commitment to the individual person in society, the humanistic perspective has been an important influence (Dillon, 2008; Robbins, 2008).

It’s important not to let the abstract qualities of the broad approaches we have discussed lull you into thinking that they are purely theoretical. These perspectives underlie ongoing work of a practical nature, as we will discuss throughout this book. To start seeing how psychology can improve everyday life, read Applying Psychology in the 21st Century.
Applying Psychology in the 21st Century

Psychology Matters

“Investigators search for clues at site of suicide bombing.”
“Deepest recession in decades produces huge rates of unemployment.”
“Eyewitness to killing proves unable to provide reliable clues.”
“Texting while driving blamed for rise in traffic fatalities.”
“Childhood obesity rates surge.”

A quick review of any day’s news headlines reminds us that the world is beset by a variety of stubborn problems that resist easy solutions. At the same time, a considerable number of psychologists are devoting their energies and expertise to addressing these problems and improving the human condition. Let’s consider some of the ways that psychology has addressed and helped work toward solutions of society’s major problems:

• **What are the causes of terrorism?** What motivates suicide bombers? Are they psychologically disordered, or can their behavior be seen as a rational response to a particular system of beliefs? As we’ll see in Module 39 when we discuss psychological disorders, psychologists are gaining an understanding of the factors that lead people to embrace suicide and to engage in terrorism to further a cause in which they deeply believe (Stronink, 2007; Locicero & Sinclair, 2008; Post et al., 2009; Mintz & Brule, 2009).

• **How can people best cope with an economic crisis?** When the economy sours, financial loss and the hovering threat of unemployment create a great deal of stress. Psychologists study how these stressors affect family relations and produce psychological harm—particularly to children of stressed and depressed parents—that can long outlast the economic crisis. They can then help people use coping strategies that are effective at preventing long-term harm (Conger and Donnellan, 2007; Ünal-Karagüven, 2009).

• **Why do eyewitnesses to crimes often remember the events inaccurately, and how can we increase the precision of eyewitness accounts?** Psychologists’ research has come to an important conclusion: Eyewitness testimony in criminal cases is often inaccurate and biased. Memories of crimes are often clouded by emotion, and the questions asked by police investigators often elicit inaccurate responses. Work by psychologists has been used to provide national guidelines for obtaining more accurate memories during criminal investigations (Loftus & Bernstein, 2005; Kassin, 2005; Busey & Loftus, 2007).

• **Does texting while driving impair people’s driving ability?** Several states have enacted controversial laws banning cell phone use and texting while driving. Although many people believe that they are perfectly able to talk and drive at the same time, psychological research on attention tells a different story: Merely talking on a cellphone, whether hands-free or not, impairs people’s driving about as much as if they were legally drunk (Strayer et al., 2005; Taggi et al., 2007; Drews, Pasupathi, & Strayer, 2008; Charlton, 2009).

• **What are the roots of obesity, and how can healthier eating and better physical fitness be encouraged?** Why are some people more predisposed to obesity than others? What social factors might be at play in the rising rate of obesity in childhood? As we’ll discuss in Module 25, obesity is a complex problem with biological, psychological, and social underpinnings. Approaches to treating obesity therefore must take many factors into account in order to be successful. There is no magic bullet providing a quick fix, but psychologists recommend a number of strategies that help make weight-loss goals more achievable (Puhl & Latner, 2007; MacLean et al., 2009; Neumark-Sztainer, 2009).

These topics represent just a few of the issues that psychologists address on a daily basis. To further explore the many ways that psychology has an impact on everyday life, check out the American Psychological Association (APA) website, which features psychological applications in everyday life, at www.apa.org.
Psychology’s Key Issues and Controversies

As you consider the many topics and perspectives that make up psychology, ranging from a narrow focus on minute biochemical influences on behavior to a broad focus on social behaviors, you might find yourself thinking that the discipline lacks cohesion. However, the field is more unified than a first glimpse might suggest. For one thing, no matter what topical area a psychologist specializes in, he or she will rely primarily on one of the five major perspectives. For example, a developmental psychologist who specializes in the study of children is likely to make use of the cognitive perspective or the psychodynamic perspective more than the other major perspectives.

Psychologists also agree on what the key issues of the field are (see Figure 3). Despite major arguments regarding how best to address and resolve these key issues, psychology is a unified science because psychologists of all perspectives agree that the issues must be addressed if the field is going to advance. As you contemplate these key issues, try not to think of them in “either/or” terms. Instead, consider the opposing viewpoints on each issue as the opposite ends of a continuum, with the positions of individual psychologists typically falling somewhere between the two ends.

*Nature (heredity) versus nurture (environment)* is one of the major issues that psychologists grapple with. How much of individual behavior is due to one’s genetically determined nature (heredity), and how much is due to nurture (the influences of the physical and social environment in which a child is raised)? Furthermore, what is the interplay between heredity and environment? These questions have deep philosophical and historical roots, and they are involved in many topics in psychology.

**Study Alert**

Use Figure 3 to learn the key issues that underlie every subfield of psychology.

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**FIGURE 3** Key issues in psychology and the positions taken by psychologists subscribing to the five major perspectives of psychology.
A psychologist’s take on this issue depends partly on which major perspective he or she subscribes to. For example, developmental psychologists who follow a neuroscience perspective and focus on how people grow and change throughout the course of their lives may be most interested in learning more about hereditary influences. In contrast, developmental psychologists who are proponents of the behavioral perspective would be more likely to focus on environment (Rutter, 2002, 2006).

However, every psychologist would agree that neither nature nor nurture alone is the sole determinant of behavior; rather, it is a combination of the two. In a sense, then, the real controversy involves how much of our behavior is caused by heredity and how much is caused by environmental influences.

A second major question addressed by psychologists concerns conscious versus unconscious causes of behavior. How much of our behavior is produced by forces of which we are fully aware, and how much is due to unconscious activity—mental processes that are not accessible to the conscious mind? This question represents one of the great controversies in the field of psychology. For example, clinical psychologists adopting a psychodynamic perspective argue that psychological disorders are brought about by unconscious factors, whereas psychologists employing the cognitive perspective suggest that psychological disorders largely are the result of faulty thinking processes.

The next issue is observable behavior versus internal mental processes. Should psychology concentrate solely on behavior that can be seen by outside observers, or should it focus on unseen thinking processes? Some psychologists, particularly those relying on the behavioral perspective, contend that the only legitimate source of information for psychologists is behavior that can be observed directly. Other psychologists, building on the cognitive perspective, argue that what goes on inside a person’s mind is critical to understanding behavior, and so we must concern ourselves with mental processes.

Free will versus determinism is another key issue. How much of our behavior is a matter of free will (choices made freely by an individual), and how much is subject to determinism, the notion that behavior is largely produced by factors beyond one’s willful control? An issue long debated by philosophers, the free will/determinism argument is also central to the field of psychology (Dennett, 2003; Cary, 2007).

For example, some psychologists who specialize in psychological disorders argue that people make intentional choices and that those who display so-called abnormal behavior should be considered responsible for their actions. Other psychologists disagree and contend that such individuals are the victims of forces beyond their control. The position psychologists take on this issue has important implications for the way they treat psychological disorders, especially when deciding whether treatment should be forced on people who don’t want it.

The last of the key issues concerns individual differences versus universal principles. How much of our behavior is a consequence of our unique and special qualities, and how much reflects the culture and society in which we live? How much of our behavior is universally human? Psychologists who rely on the neuroscience perspective tend to look for universal principles of behavior, such as how the nervous system operates or the way certain hormones automatically prime us for sexual activity. Such psychologists concentrate on the similarities in our behavioral destinies despite vast differences in our upbringing. In contrast, psychologists who employ the humanistic perspective focus more on the uniqueness of every individual. They consider every person’s behavior a reflection of distinct and special individual qualities.

The question of the degree to which psychologists can identify universal principles that apply to all people has taken on new significance in light of the tremendous demographic changes now occurring in the United States and around the world. As we discuss next, these changes raise new and critical issues for the discipline of psychology in the 21st century.

**free will** The idea that behavior is caused primarily by choices that are made freely by the individual.

**determinism** The idea that people’s behavior is produced primarily by factors outside their willful control.
Psychology’s Future

We have examined psychology’s foundations, but what does the future hold for the discipline? Although the course of scientific development is notoriously difficult to predict, several trends seem likely:

- As its knowledge base grows, psychology will become increasingly specialized and new perspectives will evolve. For example, our growing understanding of the brain and the nervous system, combined with scientific advances in genetics and gene therapy, will allow psychologists to focus on prevention of psychological disorders rather than only on their treatment (Cuijpers et al., 2008).
- The evolving sophistication of neuroscientific approaches is likely to have an increasing influence over other branches of psychology. For instance, social psychologists already are increasing their understanding of social behaviors such as persuasion by using brain scans as part of an evolving field known as social neuroscience (Bunge & Wallis, 2008; Cacioppo et al., 2009).
- Psychology’s influence on issues of public interest also will grow. The major problems of our time—such as violence, terrorism, racial and ethnic prejudice, poverty, and environmental and technological disasters—have important psychological aspects (Zimbardo, 2004; Marshall et al., 2007; Hobfoll et al., 2007).
- Finally, as the population becomes more diverse, issues of diversity—embodied in the study of racial, ethnic, linguistic, and cultural factors—will become more important to psychologists providing services and doing research. The result will be a field that can provide an understanding of human behavior in its broadest sense (Leung & Blustein, 2000; Chang & Sue, 2005; Quintana et al., 2006).

RECAP/EVALUATE/RETHINK

RECAP

What are the origins of psychology?
- Wilhelm Wundt laid the foundation of psychology in 1879, when he opened his laboratory in Germany. (p. 15)
- Early perspectives that guided the work of psychologists were structuralism, functionalism, and gestalt psychology. (p. 15)

What are the major approaches in contemporary psychology?
- The neuroscience perspective focuses on the biological components of the behavior of people and animals. (p. 19)
- The psychodynamic perspective suggests that powerful, unconscious inner forces and conflicts about which people have little or no awareness are the primary determinants of behavior. (p. 19)
- The behavioral perspective de-emphasizes internal processes and concentrates instead on observable, measurable behavior, suggesting that understanding and control of a person’s environment are sufficient to fully explain and modify behavior. (p. 19)
- The cognitive perspective to behavior considers how people know, understand, and think about the world. (p. 20)
- The humanistic perspective emphasizes that people are uniquely inclined toward psychological growth and higher levels of functioning and that they will strive to reach their full potential. (p. 20)

What are psychology’s key issues and controversies?
- Psychology’s key issues and controversies center on how much human behavior is a product of nature or nurture, conscious or unconscious thoughts, observable actions or internal mental processes, free will or determinism, and individual differences or universal principles. (p. 22)

What is the future of psychology likely to hold?
- Psychology will become increasingly specialized, will pay greater attention to prevention instead of just treatment, will become more and more concerned with the public interest, and will take the growing diversity of the country’s population into account more fully. (p. 24)
EVALUATE

1. Wundt described psychology as the study of conscious experience, a perspective he called _________.
2. Early psychologists studied the mind by asking people to describe what they were experiencing when exposed to various stimuli. This procedure was known as _________.
3. The statement “In order to study human behavior, we must consider the whole of perception rather than its component parts” might be made by a person subscribing to which perspective of psychology?
4. Jeanne’s therapist asks her to recount a violent dream she recently experienced in order to gain insight into the unconscious forces affecting her behavior. Jeanne’s therapist is working from a _________. perspective.
5. “It is behavior that can be observed that should be studied, not the suspected inner workings of the mind.” This statement was most likely made by someone with which perspective?
   a. Cognitive perspective
   b. Neuroscience perspective
   c. Humanistic perspective
   d. Behavioral perspective
6. “My therapist is wonderful! He always points out my positive traits. He dwells on my uniqueness and strength as an individual. I feel much more confident about myself—as if I’m really growing and reaching my potential.” The therapist being described most likely follows a _________. perspective.
7. In the nature–nurture issue, nature refers to heredity, and nurture refers to the _________.
8. Race is a biological concept rather than a psychological one. True or false?

RETHINK

1. Focusing on one of the five major perspectives in use today (i.e., neuroscience, psychodynamic, behavioral, cognitive, and humanistic), describe the kinds of research questions and studies that researchers using that perspective might pursue.
2. From a journalist’s perspective: Choose a current major political controversy. What psychological approaches or perspectives can be applied to that issue?

Answers to Evaluate Questions

1. Neuroscience: A. Environment; B. True
2. Structuralism: A. Gestalt; B. Psychodynamic; C. Cognitive; D. Behavioral
3. Humanistic perspective
4. Psychodynamic perspective
5. Behavior perspective
6. True
7. False
The Scientific Method

“Birds of a feather flock together” . . . or “Opposites attract”? “Two heads are better than one” . . . or “If you want a thing done well, do it yourself”? “The more the merrier” . . . or “Two’s company, three’s a crowd”?

If we were to rely on common sense to understand behavior, we’d have considerable difficulty—especially because commonsense views are often contradictory. In fact, one of the major undertakings for the field of psychology is to develop suppositions about behavior and to determine which of those suppositions are accurate.

Psychologists—as well as scientists in other disciplines—meet the challenge of posing appropriate questions and properly answering them by relying on the scientific method. The scientific method is the approach used by psychologists to systematically acquire knowledge and increase understanding about behavior and other phenomena of interest. As illustrated in Figure 1, it consists of four main steps: (1) identifying questions of interest, (2) formulating an explanation, (3) carrying out research designed to support or refute the explanation, and (4) communicating the findings.

THEORIES: SPECIFYING BROAD EXPLANATIONS

When using the scientific method, psychologists start by identifying questions of interest. We’ve all been curious at some time about our observations of everyday behavior. If you have ever asked yourself why a particular teacher is so easily annoyed, why a friend is always late for appointments, or how your dog understands your commands, you have been formulating questions about behavior.

Psychologists, too, ask questions about the nature and causes of behavior. They may explore explanations for everyday behaviors or for various phenomena. They may also pose questions that build on findings from their own previous research or from research carried out by other psychologists. Or they may produce new questions based on curiosity, creativity, or insight.

Once a question has been identified, the next step in the scientific method is to develop a theory to explain the observed phenomenon. Theories are broad explanations and predictions concerning phenomena of interest. They provide a framework for understanding the relationships among a set of otherwise unorganized facts or principles.

All of us have developed our own informal theories of human behavior, such as “People are basically good” or “People’s behavior is usually motivated by
self-interest.” However, psychologists’ theories are more formal and focused. They are established on the basis of a careful study of the psychological literature to identify earlier relevant research and previously formulated theories, as well as on psychologists’ general knowledge of the field (Sternberg & Beall, 1991; McGuire, 1997).

Growing out of the diverse approaches employed by different psychologists, theories vary both in their breadth and in their level of detail. For example, one theory might seek to explain and predict a phenomenon as broad as emotional experience. A narrower theory might attempt to explain why people display the emotion of fear nonverbally after receiving a threat (Guerrero, La Valley, & Farinelli, 2008; Waller, Cray, & Burrows, 2008).

Theories can help us understand otherwise perplexing behavior. For example, consider the famous case of a woman named Kitty Genovese, who was attacked by a man near a crowded apartment building in New York City. At one point during the assault, which lasted 30 minutes, she managed to free herself and screamed, “Oh, my God, he stabbed me. Please help me!” But not one person helped, and Genovese was stabbed to death and sexually molested (Rogers & Eftimiades, 1995; Rosenthal, 2008).

Responding to the failure of bystanders to intervene while Kitty Genovese was murdered in New York, psychologists Bibb Latané and John Darley developed what they called a theory of diffusion of responsibility (Latané & Darley, 1970). According to their theory, the greater the number of bystanders or witnesses to an event that calls for helping behavior, the more the responsibility for helping is perceived to be shared by all the bystanders. Thus, the greater the number of bystanders in an emergency situation, the smaller the share of the responsibility each person feels—and the less likely it is that any single person will come forward to help.

**HYPOTHESES: CRAFTING TESTABLE PREDICTIONS**

Although the diffusion of responsibility theory seems to make sense, it represented only the beginning of Latané and Darley’s investigative process. Their next step was to devise a way to test their theory. To do this, they needed to create a hypothesis. A **hypothesis** is a prediction stated in a way that allows it to be tested. Hypotheses stem from theories; they help test the underlying soundness of theories.

In the same way that we develop our own broad theories about the world, we also construct hypotheses about events and behavior in our lives. Those hypotheses can range from trivialities (such as why our English teacher wears those weird shirts) to more meaningful matters (such as what is the best way to study for a test). Although we rarely test these hypotheses systematically, we do try to determine whether they are right. Perhaps we try comparing two strategies: cramming the night before an exam versus spreading out our study over several nights. By assessing which approach yields better test performance, we have created a way to compare and even measure the two strategies.

A hypothesis must be restated in a way that will allow it to be tested, which involves creating an operational definition. An **operational definition** is the translation of a hypothesis into specific, testable procedures that can be measured and observed.

There is no single way to go about devising an operational definition for a hypothesis; it depends on logic, the equipment and facilities available, the psychological perspective being employed, and ultimately, the creativity of the researcher. For example, one researcher might develop a hypothesis that uses “an increase in heart rate” as an operational definition of “fear.” In contrast, another psychologist’s an operational definition of “fear” might be written responses to the question “How much fear are you experiencing at this moment?”

Latané and Darley’s hypothesis was a straightforward prediction from their more general theory of diffusion of responsibility: The more people who witness an emergency situation, the less likely it is that help will be given to a victim. They could,
of course, have chosen another hypothesis (try to think of one!), but their initial formulation seemed to offer the most direct explanation of the theory.

Psychologists rely on formal theories and hypotheses for many reasons. For one thing, theories and hypotheses allow them to make sense of unorganized, separate observations and bits of information by permitting them to place the pieces within a coherent framework. In addition, theories and hypotheses offer psychologists the opportunity to move beyond known facts and make deductions about unexplained phenomena and develop ideas for future investigation (Howitt & Cramer, 2000; Cohen, 2003; Gurin, 2006).

In short, the scientific method, with its emphasis on theories and hypotheses, helps psychologists pose appropriate questions. With properly stated questions in hand, psychologists then can choose from a variety of research methods to find answers.

**Psychological Research**

*Research*—or systematic inquiry aimed at the discovery of new knowledge—is a central ingredient of the scientific method in psychology. It provides the key to understanding the degree to which hypotheses (and the theories behind them) are accurate.

Just as we can apply different theories and hypotheses to explain the same phenomena, we can use a number of alternative methods to conduct research. As we consider the major tools psychologists use to conduct research, keep in mind that their relevance extends beyond testing and evaluating abstract hypotheses in psychology. All of us carry out elementary forms of practical research on our own. For instance, a supervisor might evaluate an employee’s performance; a physician may systematically test the effects of different doses of a drug on a patient; a salesperson can compare different persuasive strategies. Each of these situations draws on the research practices we are about to discuss.

**Descriptive Research**

Let’s begin by considering several types of *descriptive research* designed to systematically investigate a person, group, or patterns of behavior. These methods include archival research, naturalistic observation, survey research, and case studies.

**ARCHIVAL RESEARCH**

Suppose that, like the psychologists Latané and Darley (1970), you were interested in finding out more about emergency situations in which bystanders did not provide help. One of the first places you might look would be historical accounts. By searching newspaper records, for example, you might find historic support for the notion that a decrease in helping behavior has accompanied an increase in the number of bystanders.

Using newspaper articles is an example of archival research. In *archival research*, existing data, such as census documents, college records, and newspaper clippings, are examined to test a hypothesis.

Archival research is a relatively inexpensive means of testing a hypothesis because someone else has already collected the basic data. Of course, the use of existing data has several drawbacks. For one thing, the data may not be in a form that allows the researcher to test a hypothesis fully. The information could be incomplete, or it could have been collected haphazardly (Simonton, 2000; Riniolo et al., 2003; Vega, 2006).
Most attempts at archival research are hampered by the simple fact that records with the necessary information often do not exist. In these instances, researchers often turn to another research method: naturalistic observation.

**NATURALISTIC OBSERVATION**

During **naturalistic observation**, the investigator observes some naturally occurring behavior and doesn’t make a change in the situation. For example, a researcher investigating helping behavior might observe the kind of help given to victims in a high-crime area of a city. The important point to remember about naturalistic observation is that the researcher simply records what occurs, making no modification to the situation that’s being observed (Schutt, 2001; Moore, 2002; Rustin, 2006).

Although the advantage of naturalistic observation is obvious—we get a sample of what people do in their “natural habitat”—there is also an important drawback: the inability to control any of the factors of interest. For example, we might find so few naturally occurring instances of helping behavior that we would be unable to draw any conclusions. Because naturalistic observation prevents researchers from making changes in a situation, they must wait until the appropriate conditions occur. Furthermore, if people know they are being watched, they may alter their reactions and produce behavior that is not truly representative.

**SURVEY RESEARCH**

There is no more straightforward way of finding out what people think, feel, and do than asking them directly. For this reason, surveys are an important research method. In **survey research**, a sample of people chosen to represent a larger group of interest (a population) is asked a series of questions about their behavior, thoughts, or attitudes. Survey methods have become so sophisticated that even with a very small sample researchers are able to infer with great accuracy how a larger group would respond. For instance, a sample of just a few thousand voters is sufficient to predict within one or two percentage points who will win a presidential election—if the representative sample is chosen with care (Sommer & Sommer, 2001; Groves et al., 2004; Igo, 2006).

Researchers investigating helping behavior might conduct a survey that asks people to indicate their reluctance about giving aid to someone. Similarly, researchers interested in learning about sexual practices have carried out surveys to learn which practices are common and which are not and to chart changing notions of sexual morality over several decades (Reece et al., 2009; Santelli et al., 2009).

However, survey research has several potential pitfalls. For one thing, if the sample of people who are surveyed is not representative of the broader population of interest, the results of the survey will have little meaning. For instance, if a sample of voters in a town only includes Republicans, it would hardly be useful for predicting the results of an election in which both Republicans and Democrats are voting. Consequently, researchers using surveys strive to obtain a **random sample** of the population in question, in which every member of the population—in this case, every voter—has an equal chance of being included in the sample receiving the survey (Daley, 2003; Dale, 2006).

In addition, survey respondents may not want to admit to holding socially undesirable attitudes. (Most racists know they are racists but might not want to admit it.) And in some cases, people may not even be consciously aware of what their true attitudes are or why they hold them.
THE CASE STUDY

When they read about a suicide bomber in the Middle East, many people wonder what it is about the terrorist’s personality or background that leads to such behavior. To answer this question, psychologists might conduct a case study. In contrast to a survey, in which many people are studied, a case study is an in-depth, intensive investigation of a single individual or a small group. Case studies often include psychological testing, a procedure in which a carefully designed set of questions is used to gain insight into the personality of the individual or group (Gass et al., 2000; Addus, Chen, & Khan, 2007).

When case studies are used as a research technique, the goal is often not only to learn about the few individuals being examined but also to use insights gained from the study to improve our understanding of people in general. Sigmund Freud developed his theories through case studies of individual patients. Similarly, case studies of terrorists might help identify others who are prone to violence.

The drawback to case studies? If the individuals examined are unique in certain ways, it is impossible to make valid generalizations to a larger population. Still, they sometimes lead the way to new theories and treatments for psychological disorders.

CORRELATIONAL RESEARCH

When using the descriptive research methods we have discussed above, researchers often wish to determine the relationship between two variables. Variables are behaviors, events, or other characteristics that can change or vary in some way. For example, in a study to determine whether the amount of time spent studying makes a difference in test scores, the variables would be study time and test scores.

In correlational research, two sets of variables are examined to determine whether they are associated or “correlated.” The strength and direction of the relationship between the two variables are represented by a mathematical statistic known as a correlation (or, more formally, a correlation coefficient) that can range from +1.0 to −1.0.

A positive correlation indicates that as the value of one variable increases, we can predict that the value of the other variable will also increase. For example, if we predict that the more time students spend studying for a test, the higher their grades on the test will be, and that the less they study, the lower their test scores will be, we are expecting to find a positive correlation. In other words, higher values of the variable “amount of study time” is associated with higher values of the variable “test score,” and lower values of “amount of study time” is associated with lower values of “test score.” The correlation, then, would be indicated by a positive number, and the stronger the association was between studying and test scores, the closer the number would be to +1.0. For example, we might find a correlation of +.85 between test scores and amount of study time, indicating a strong positive association.

In contrast, a negative correlation tells us that as the value of one variable increases, the value of the other decreases. For instance, we might predict that as the number of hours spent studying increases, the number of hours spent partying decreases. Here we are expecting a negative correlation, ranging between 0 and −1.0. More studying is associated with less partying, and less studying is associated with more partying. The stronger the association between studying and partying, the closer the correlation will be to −1.0. For instance, a correlation of −.85 would indicate a strong negative association between partying and studying.

Of course, it’s quite possible that little or no relationship exists between any two variables. For instance, we would probably not expect to find a relationship between number of study hours and height. Lack of a relationship would be indicated by a correlation close to 0. For example, if we found a correlation of −.02 or +.03, it’s a weak correlation indicating that there is virtually no association between the two variables; knowing how much someone studies does not tell us anything about how tall he or she is.
When two variables are strongly correlated with each other, it is tempting to assume that one variable causes the other. For example, if we find that more study time is associated with higher grades, we might guess that more studying causes higher grades. Although this is not a bad guess, it remains just a guess—because finding that two variables are correlated does not mean that there is a causal relationship between them. The strong correlation suggests that knowing how much a person studies can help us predict how that person will do on a test, but it does not mean that the studying causes the test performance. It might be, for instance, that people who are more interested in the subject matter tend to study more than do those who are less interested, and that the amount of interest, not the number of hours spent studying, predicts test performance. The mere fact that two variables occur together does not mean that one causes the other.

Similarly, suppose you learned that the number of houses of worship in a large sample of cities was positively correlated with the number of people arrested, meaning that the more houses of worship, the more arrests there were in a city. Does this mean that the presence of more houses of worship caused the greater number of arrests? Almost surely not, of course. In this case, the underlying cause is probably the size of the city: In bigger cities, there are both more houses of worship and more arrests.

One more example illustrates the critical point that correlations tell us nothing about cause and effect but instead provide a measure of the strength of a relationship between two variables. We might find that children who watch a lot of television programs featuring high levels of aggression are likely to demonstrate a relatively high degree of aggressive behavior and that those who watch few television shows that portray aggression are apt to exhibit a relatively low degree of such behavior (see Figure 2). But we cannot say that the aggression is caused by the TV viewing, because many other explanations are possible.

For instance, it could be that children who have an unusually high level of energy seek out programs with aggressive content and are more aggressive. The children’s energy level, then, could be the true cause of the children’s higher incidence of aggression. It is also possible that people who are already highly aggressive choose to watch violence in the media is associated with aggression in viewers. Can we conclude that the observation of violence causes aggression?
shows with a high aggressive content because they are aggressive. Clearly, then, any number of causal sequences are possible—none of which can be ruled out by correlational research (Feshbach & Tangney, 2008; Grimes & Bergen, 2008).

The inability of correlational research to demonstrate cause-and-effect relationships is a crucial drawback to its use. There is, however, an alternative technique that does establish causality: the experiment.

**Experimental Research**

The only way psychologists can establish cause-and-effect relationships through research is by carrying out an experiment. In a formal experiment, the researcher investigates the relationship between two (or more) variables by deliberately changing one variable in a controlled situation and observing the effects of that change on other aspects of the situation. In an experiment, then, the conditions are created and controlled by the researcher, who deliberately makes a change in those conditions to observe the effects of that change.

The change that the researcher deliberately makes in an experiment is called experimental manipulation. Experimental manipulations are used to detect relationships between different variables.

Several steps are involved in carrying out an experiment, but the process typically begins with the development of one or more hypotheses for the experiment to test. For example, in testing their theory of the diffusion of responsibility in bystander behavior, Latané and Darley developed this hypothesis: The higher the number of people who witness an emergency situation, the less likely it is that any will help the victim. They then designed an experiment to test this hypothesis.

Their first step was to formulate an operational definition of the hypothesis by conceptualizing it in a way that could be tested. Latané and Darley had to take into account the fundamental principle of experimental research mentioned earlier: Experimenters must manipulate at least one variable in order to observe the effects of the manipulation on another variable while keeping other factors in the situation constant. However, the manipulation cannot be viewed by itself, in isolation; if a cause-and-effect relationship is to be established, the effects of the manipulation must be compared with the effects of no manipulation or a different kind of manipulation.
EXPERIMENTAL GROUPS AND CONTROL GROUPS

Experimental research requires, then, that the responses of at least two groups be compared. One group will receive some special treatment—the manipulation implemented by the experimenter—and the other group will receive either no treatment or a different treatment. Any group that receives a treatment is called an experimental group; a group that receives no treatment is called a control group. (In some experiments there are multiple experimental and control groups, each of which is compared with another group.)

By employing both experimental and control groups in an experiment, researchers are able to rule out the possibility that something other than the experimental manipulation produced the results observed in the experiment. Without a control group, we couldn’t be sure that some other variable, such as the temperature at the time of the experiment, the color of the experimenter’s hair, or even the mere passage of time, wasn’t causing the changes observed.

For example, consider a medical researcher who thinks he has invented a medicine that cures the common cold. To test his claim, he gives the medicine one day to a group of 20 people who have colds and finds that 10 days later all of them are cured.

Eureka? Not so fast. An observer viewing this flawed study might reasonably argue that the people would have gotten better even without the medicine. What the researcher obviously needed was a control group consisting of people with colds who don’t get the medicine and whose health is also checked 10 days later. Only if there is a significant difference between experimental and control groups can the effectiveness of the medicine be assessed. Through the use of control groups, then, researchers can isolate specific causes for their findings—and draw cause-and-effect inferences.

Returning to Latané and Darley’s experiment, we see that the researchers needed to translate their hypothesis into something testable. To do this, they decided to create a false emergency situation that would appear to require the aid of a bystander. As their experimental manipulation, they decided to vary the number of bystanders present. They could have had just one experimental group with, say, two people present, and a control group for comparison purposes with just one person present. Instead, they settled on a more complex procedure involving groups of three sizes—consisting of two, three, and six people—that could be compared with one another.

Independent and Dependent Variables. Latané and Darley’s experimental design now included an operational definition of what is called the independent variable. The independent variable is the condition that is manipulated by an experimenter. (You can think of the independent variable as being independent of the actions of those taking part in an experiment; it is controlled by the experimenter.) In the case of the Latané and Darley experiment, the independent variable was the number of people present as manipulated by the experimenters.

The next step was to decide how they were going to determine the effect that varying the number of bystanders had on the behavior of those in the experiment. Crucial to every experiment is the dependent variable, the variable that is measured and is expected to change as a result of changes caused by the experimenter’s manipulation of the independent variable. The dependent variable is dependent on the actions of the participants or subjects—the people taking part in the experiment.
Latané and Darley had several possible choices for their dependent measure. One might have been a simple yes/no measure of the participants’ helping behavior. But the investigators also wanted a more precise analysis of helping behavior. Consequently, they also measured the amount of time it took for a participant to provide help.

Latané and Darley now had all the necessary components of an experiment. The independent variable, manipulated by them, was the number of bystanders present in an emergency situation. The dependent variable was the measure of whether bystanders in each of the groups provided help and the amount of time it took them to do so. Consequently, like all experiments, this one had both an independent variable and a dependent variable. All true experiments in psychology fit this straightforward model.

**RANDOM ASSIGNMENT OF PARTICIPANTS**

To make the experiment a valid test of the hypothesis, Latané and Darley needed to add a final step to the design: properly assigning participants to a particular experimental group.

The significance of this step is clear when we examine various alternative procedures. For example, the experimenters might have assigned just males to the group with two bystanders, just females to the group with three bystanders, and both males and females to the group with six bystanders. If they had done this, however, any differences they found in helping behavior could not be attributed with any certainty solely to group size, because the differences might just as well have been due to the composition of the group. A more reasonable procedure would be to ensure that each group had the same composition in terms of gender; then the researchers would be able to make comparisons across groups with considerably more accuracy.

Participants in each of the experimental groups ought to be comparable, and it’s easy enough to create groups that are similar in terms of gender. The problem becomes a bit more tricky, though, when we consider other participant characteristics. How can we ensure that participants in each experimental group will be equally intelligent, extroverted, cooperative, and so forth, when the list of characteristics—any one of which could be important—is potentially endless?

The solution is a simple but elegant procedure called **random assignment to condition**: Participants are assigned to different experimental groups or “conditions” on the basis of chance and chance alone. The experimenter might, for instance, flip a coin for each participant and assign a participant to one group when “heads” came up, and to the other group when “tails” came up. The advantage of this technique is that there is an equal chance that participant characteristics will be distributed across the various groups. When a researcher uses random assignment—which in practice is usually carried out using computer-generated random numbers—chances are that each of the groups will have approximately the same proportion of intelligent people, cooperative people, extroverted people, males and females, and so on.

Figure 3 provides another example of an experiment. Like all experiments, it includes the following set of key elements, which are important to keep in mind as you consider whether a research study is truly an experiment:

- An independent variable, the variable that is manipulated by the experimenter.
- A dependent variable, the variable measured by the experimenter that’s expected to change as a result of the manipulation of the independent variable.
- A procedure that randomly assigns participants to different experimental groups or “conditions” of the independent variable.
- A hypothesis that predicts the effect the independent variable will have on the dependent variable.
Only if each of these elements is present can a research study be considered a true experiment in which cause-and-effect relationships can be determined. (For a summary of the different types of research that we’ve discussed, see Figure 4.)

FIGURE 3 In this depiction of a study investigating the effects of the drug propranolol on stress, we can see the basic elements of all true experiments. The participants in the experiment were monkeys who were randomly assigned to one of two groups. Monkeys assigned to the treatment group were given propranolol, hypothesized to prevent heart disease, whereas those in the control group were not given the drug. Administration of the drug, then, was the independent variable.

All the monkeys were fed a high-fat diet that was the human equivalent of two eggs with bacon every morning, and they occasionally were reassigned to different cages to provide a source of stress. To determine the effects of the drug, the monkeys’ heart rates and other measures of heart disease were assessed after 26 months. These measures constituted the dependent variable. (The results? As hypothesized, monkeys who received the drug showed lower heart rates and fewer symptoms of heart disease than those who did not.)

(Source: Based on a study by Kaplan & Manuck, 1989.)

**WERE LATANÉ AND DARLEY RIGHT?**

To test their hypothesis that increasing the number of bystanders in an emergency situation would lower the degree of helping behavior, Latané and Darley placed the participants in a room and told them that the purpose of the experiment was to talk about personal problems associated with college. The discussion was to be held over an intercom, supposedly to avoid the potential embarrassment of face-to-face contact. Chatting about personal problems was not, of course, the true purpose of the experiment, but telling the participants that it was provided a way of keeping their expectations from biasing their behavior. (Consider how they would have been affected if they had been told that their helping behavior in emergencies was being tested. The experimenters could never have gotten an accurate assessment of what the participants would actually do in an emergency. By definition, emergencies are rarely announced in advance.)
The sizes of the discussion groups were two, three, and six people, which constituted the manipulation of the independent variable of group size. Participants were randomly assigned to these groups upon their arrival at the laboratory. Each group included a trained confederate, or employee, of the experimenters. In each two-person group, then, there was only one real "bystander."

As the participants in each group were holding their discussion, they suddenly heard through the intercom one of the other participants—the confederate—having what sounded like an epileptic seizure and calling for help.

The participants’ behavior was now what counted. The dependent variable was the time that elapsed from the start of the “seizure” to the time a participant began trying to help the “victim.” If six minutes went by without a participant’s offering help, the experiment was ended.

As predicted by the hypothesis, the size of the group had a significant effect on whether a participant provided help. The more people who were present, the less likely it was that someone would supply help, as you can see in Figure 5 (Latané & Darley, 1970).

Because these results are so straightforward, it seems clear that the experiment confirmed the original hypothesis. However, Latané and Darley could not be sure that the results were truly meaningful until they determined whether the results represented a significant outcome. Using statistical analysis, researchers can determine
whether a numeric difference is a real difference or is due merely to chance. Only when differences between groups are large enough that statistical tests show them to be significant is it possible for researchers to confirm a hypothesis (Cwikel, Behar, & Rabson-Hare, 2000; Cohen, 2002).

Moving Beyond the Study. The Latané and Darley study contains all the elements of an experiment: an independent variable, a dependent variable, random assignment to conditions, and multiple experimental groups. Consequently, we can say with some confidence that group size caused changes in the degree of helping behavior.

Of course, one experiment alone does not forever resolve the question of bystander intervention in emergencies. Psychologists—like other scientists—require that findings be replicated or repeated, sometimes using other procedures in other settings with other groups of participants, before full confidence can be placed in the results of any single experiment. A procedure called meta-analysis permits psychologists to combine the results of many separate studies into one overall conclusion (Tenenbaum & Ruck, 2007; Cooper & Patall, 2009).

In addition to replicating experimental results, psychologists need to test the limitations of their theories and hypotheses to determine under which specific circumstances they do and do not apply. It seems unlikely, for instance, that increasing the number of bystanders always results in less helping. Therefore, it is critical to continue carrying out experiments to understand the conditions in which exceptions to this general rule occur and other circumstances in which the rule holds (Garcia et al., 2002).

Before leaving the Latané and Darley study, it’s important to note that it represents a good illustration of the basic principles of the scientific method we considered earlier (as outlined in Figure 1 of Module 3). The two psychologists began with a question of interest, in this case stemming from a real-world incident in which bystanders in an emergency did not offer help. They then formulated an explanation by specifying a theory of diffusion of responsibility, and from that formulated the specific hypothesis that increasing the number of bystanders in an emergency situation would lower the degree of helping behavior. Finally, they carried out research to confirm their hypothesis and they eventually communicated their findings by publishing their results. This four-step process embodied in the scientific method underlies all scientific inquiry, allowing us to develop a valid understanding of others’—and our own—behavior.

FIGURE 5 The Latané and Darley experiment showed that as the size of the group witnessing an emergency increased (the independent variable in the experiment), helping behavior decreased (the dependent variable in the experiment). (Source: Darley & Latané, 1968.)
RECAP/EVALUATE/RETHINK

RECAP

What is the scientific method?
• The scientific method is the approach psychologists use to understand behavior. It consists of four steps: identifying questions of interest, formulating an explanation, carrying out research that is designed to support or refute the explanation, and communicating the findings. (p. 26)
• To test a hypothesis, researchers must formulate an operational definition that translates the abstract concepts of the hypothesis into the actual procedures used in the study. (p. 27)

What role do theories and hypotheses play in psychological research?
• Research in psychology is guided by theories (broad explanations and predictions regarding phenomena of interest) and hypotheses (theory-based predictions stated in a way that allows them to be tested). (p. 28)

What research methods do psychologists use?
• Archival research uses existing records, such as old newspapers or other documents, to test a hypothesis. In naturalistic observation, the investigator acts mainly as an observer, making no change in a naturally occurring situation. For survey research, people are asked a series of questions about their behavior, thoughts, or attitudes. The case study is an in-depth interview and examination of one person or group. (p. 28)
• These descriptive research methods rely on correlational techniques, which describe associations between variables but cannot determine cause-and-effect relationships. (p. 30)

How do psychologists establish cause-and-effect relationships using experiments?
• During a formal experiment, participants must be assigned randomly to treatment conditions so that participant characteristics are distributed evenly across the different conditions. (p. 34)
• Psychologists use statistical tests to determine whether research findings are significant. (p. 36)
• During a formal experiment, participants must be assigned randomly to treatment conditions so that participant characteristics are distributed evenly across the different conditions. (p. 34)
• Psychologists use statistical tests to determine whether research findings are significant. (p. 36)

EVALUATE

1. An explanation for a phenomenon of interest is known as a ___________.
2. To test this explanation, a researcher must state it in terms of a testable question known as a ___________.
3. An experimenter is interested in studying the relationship between hunger and aggression. She decides that she will measure aggression by counting the number of times a participant hits a punching bag. In this case, her ___________ definition of aggression is the number of times the participant hits the bag.
4. Match the following forms of research to their definitions:
   1. Archival research
   2. Naturalistic observation
   3. Survey research
   4. Case study
   a. Directly asking a sample of people questions about their behavior
   b. Examining existing records to test a hypothesis
   c. Looking at behavior in its true setting without intervening in the setting
   d. Doing an in-depth investigation of a person or small group
5. Match each of the following research methods with its primary disadvantage:
   1. Archival research
   2. Naturalistic observation
   3. Survey research
   4. Case study
   a. The researcher may not be able to generalize to the population at large.
   b. People’s behavior can change if they know they are being watched.
   c. The data may not exist or may be unusable.
   d. People may lie in order to present an acceptable image.
6. A psychologist wants to study the effect of attractiveness on willingness to help a person with a math problem. Attractiveness would be the ___________ variable, and the amount of helping would be the ___________ variable.
7. The group in an experiment that receives no treatment is called the ___________ group.
RETHINK

1. Starting with the theory that diffusion of responsibility causes responsibility for helping to be shared among bystanders, Latané and Darley derived the hypothesis that the more people who witness an emergency situation, the less likely it is that help will be given to a victim. How many other hypotheses can you think of that are based on the same theory of diffusion of responsibility?

2. Can you describe how a researcher might use naturalistic observation, case studies, and survey research to investigate gender differences in aggressive behavior at the workplace? First state a hypothesis, then describe your research approaches. What positive and negative features does each method have?

3. From a health-care worker’s perspective: Tobacco companies have asserted that no experiment has ever proved that tobacco use causes cancer. Can you explain this claim in terms of the research procedures and designs discussed in this module? What sort of research would establish a cause-and-effect relationship between tobacco use and cancer?

Answers to Evaluate Questions

Module 3  Research in Psychology

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You probably realize by now that there are few simple formulas for psychological research. Psychologists must make choices about the type of study to conduct, the measures to take, and the most effective way to analyze the results. Even after they’ve made these essential decisions, they must still consider several critical issues. We turn first to the most fundamental of these issues: ethics.

### The Ethics of Research

Put yourself in the place of one of the participants in the experiment conducted by Latané and Darley to examine the helping behavior of bystanders, during which another “bystander” simulating a seizure turned out to be a confederate of the experimenters (Latané & Darley, 1970). How would you feel when you learned that the supposed victim was in reality a paid accomplice?

Although you might at first experience relief that there had been no real emergency, you might also feel some resentment that you had been deceived by the experimenter. You might also experience concern that you had been placed in an embarrassing or compromising situation—one that might have dealt a blow to your self-esteem, depending on how you had behaved.

Most psychologists argue that deception is sometimes necessary to prevent participants from being influenced by what they think a study’s true purpose is. (If you knew that Latané and Darley were actually studying your helping behavior, wouldn’t you automatically have been prompted to intervene in the emergency?) To avoid such outcomes, a small proportion of research involves deception.

Nonetheless, because research has the potential to violate the rights of participants, psychologists are expected to adhere to a strict set of ethical guidelines aimed at protecting participants (American Psychological Association, 2002). Those guidelines involve the following safeguards:

- Protection of participants from physical and mental harm.
- The right of participants to privacy regarding their behavior.
- The assurance that participation in research is completely voluntary.
- The necessity of informing participants about the nature of the procedures before their participation in the experiment.

All experiments must be reviewed by an independent panel before being conducted, including the minority of studies that involve deception (Smith, 2003; Fisher et al., 2002, 2003).

One of psychologists’ key ethical principles is **informed consent**. Before participating in an experiment, all participants must sign a document affirming that they have been told the basic outlines of the study and are aware of what their participation will involve, what risks the experiment may hold, that their participation is purely voluntary, and that they may terminate it at any time. Furthermore, after participation in a study, they must be given a debriefing in which they receive an explanation of the study and the procedures that were involved. The only time...
Although readily available and widely used as research subjects, college students may not represent the population at large. What are some advantages and drawbacks of using college students as subjects?

Informed consent and a debriefing can be eliminated for experiments in which the risks are minimal, as in a purely observational study in a public place (Koocher, Norcross, & Hill, 2005; Fallon, 2006; Barnett et al., 2007).

When Latané and Darley, both college professors, decided who would participate in their experiment, they turned to the people most available to them: college students. Using college students as participants has both advantages and drawbacks. The biggest benefit is that because most research occurs in university settings, college students are readily available. Typically, they cost the researcher very little: They often participate for either extra course credit or a relatively small payment.

The problem is that college students may not represent the general population adequately. They tend to be younger and better educated than a significant percentage of the rest of the population of the United States. Compared with older adults, their attitudes are likely to be less formed, and they are more apt to be influenced by authority figures and peers (Sears, 1986).

College students are also disproportionately white and middle class. However, even in research that doesn’t involve college students, participants are often white and middle class; the use of African Americans, Latinos, Asians, and other minorities as participants is relatively low (Graham, 1992; Guthrie, 1998). Because psychology is a science with the goal to explain human behavior generally, it is critical to use participants who are fully representative of the general population in terms of gender, age, race, ethnicity, socioeconomic status, and educational level (also see Figure 1). To encourage a wider range of participants, the National Institute of Mental Health and the National Science Foundation—the primary U.S. funding sources for psychological research—now require that experiments address issues that apply to diverse populations (Carpenter, 2002; Lindley, 2006).
Should Animals Be Used in Research?

Like those who work with humans, researchers who use nonhuman animals in experiments have their own set of exacting guidelines to ensure that the animals do not suffer. Specifically, researchers must make every effort to minimize discomfort, illness, and pain. Procedures that subject animals to distress are permitted only when an alternative procedure is unavailable and when the research is justified by its prospective value. Moreover, researchers strive to avoid causing physical discomfort, but they are also required to promote the psychological well-being of some species of research animals, such as primates (Rusche, 2003; Lutz & Novak, 2005; Auer et al., 2007).

**Neuroscience in Your Life: The Importance of Using Representative Participants**

FIGURE 1 In this study, scientists recorded electrical brain activity to gauge attention in children. The results demonstrated that the level of education a child’s mother has influences her child’s ability to pay attention. Children whose mothers had a higher level of education show greater brain activation when listening to a story than when they were ignoring the story, compared with children whose mothers had a lower level of education. (Source: Stevens et al., 2009.)

High Maternal Education

Low Maternal Education
Research involving animals is controversial but, when conducted within ethical guidelines, yields significant benefits for humans.

But why should animals be used for research in the first place? Is it really possible to learn about human behavior from the results of research employing rats, gerbils, and pigeons?

The answer is that psychological research that employs nonhumans is designed to answer questions that are different from those posed in research with humans. For example, the shorter life span of animals (rats live an average of 2 years) allows researchers to learn about the effects of aging in a relatively short time frame. It is also possible to provide greater experimental control over nonhumans and to carry out procedures that might not be possible with people. For example, some studies require large numbers of participants that share similar backgrounds or have been exposed to particular environments—conditions that could not practically be met with human beings.

Research with animals has provided psychologists with information that has profoundly benefited humans. For instance, it furnished the keys to detecting eye disorders in children early enough to prevent permanent damage; to communicating more effectively with severely retarded children; and to reducing chronic pain in people. Still, the use of research using nonhumans is controversial, involving complex moral and philosophical concerns. Consequently, all research involving nonhumans must be carefully reviewed beforehand to ensure that it is conducted ethically (Saucier & Cain, 2006; Hackam, 2007; Shankar & Simmons, 2009).

Threats to Experimental Validity: Avoiding Experimental Bias

Even the best-laid experimental plans are susceptible to experimental bias—factors that distort the way the independent variable affects the dependent variable in an experiment. One of the most common forms of experimental bias is experimenter expectations: An experimenter unintentionally transmits cues to participants about the way they are expected to behave in a given experimental condition. The danger is

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Experimental bias Factors that distort how the independent variable affects the dependent variable in an experiment.
that those expectations will bring about an “appropriate” behavior—one that otherwise might not have occurred (Rosenthal, 2002, 2003).

A related problem is participant expectations about appropriate behavior. If you have ever been a participant in an experiment, you know that you quickly develop guesses about what is expected of you. In fact, it’s typical for people to develop their own hypotheses about what the experimenter hopes to learn from the study. If participants form their own hypotheses, it may be the participant’s expectations rather than the experimental manipulation that produce an effect (Rutherford et al., 2009).

To guard against participant expectations biasing the results of an experiment, the experimenter may try to disguise the true purpose of the experiment. Participants who do not know that helping behavior is being studied, for example, are more apt to act in a “natural” way than they would if they knew.

Sometimes it’s impossible to hide the actual purpose of research; when that’s the case, other techniques are available to prevent bias. Suppose you were interested in testing the ability of a new drug to alleviate the symptoms of severe depression. If you simply gave the drug to half your participants and not to the other half, the participants who were given the drug might report feeling less depressed merely because they knew they were getting a drug. Similarly, participants who got nothing might report feeling no better because they knew that they were in a no-treatment control group.

To solve this problem, psychologists typically use a procedure so that all participants receive a treatment, but those in the control group receive only a placebo or false treatment such as a pill, “drug,” or other substance that has no significant chemical properties or active ingredient. Because members of both groups are kept in the dark about whether they are getting a real or a false treatment, any differences in outcome can be attributed to the quality of the drug and not to the possible psychological effects of being administered a pill or other substance (Rajagopal, 2006; Crum & Langer, 2007).

However, there is one more safeguard that a careful researcher must apply in an experiment such as this one. To offset the possibility that experimenter expectations will affect the participant, the person who administers the drug shouldn’t know whether it’s actually the true drug or the placebo. By keeping both the participant and the experimenter who interacts with the participant “blind” to the nature of the drug that is being administered, researchers can more accurately assess the effects of the drug. This method is known as the double-blind procedure.

**placebo** A false treatment, such as a pill, “drug,” or other substance without any significant chemical properties or active ingredient.

**Study Alert**

It’s important to know the main types of potential bias in experiments: experimenter expectations, participant expectations, and placebo effects.
If you were about to purchase an automobile, it’s unlikely that you would stop at the nearest dealership and drive off with the first car a salesperson recommended. Instead, you would probably mull over the purchase, read about automobiles, consider the alternatives, talk to others about their experiences, and ultimately put in a fair amount of thought before you made such a major purchase.

In contrast, many of us are considerably less conscientious when we expend our intellectual rather than financial assets. People often jump to conclusions on the basis of incomplete and inaccurate information, and only rarely do they take the time to critically evaluate the research and data to which they are exposed.

Because the field of psychology is based on an accumulated body of research, it’s crucial to scrutinize thoroughly the methods, results, and claims of researchers. Several basic questions can help us sort through what is valid and what is not. Among the most important questions to ask are the following:

- **What was the purpose of the research?** Research studies should evolve from a clearly specified theory. Furthermore, we must take into account the specific hypothesis that is being tested. Unless we know what hypothesis is being examined, it is not possible to judge how successful a study has been.

- **How well was the study conducted?** Consider who the participants were, how many were involved, what methods were employed, and what problems the researcher encountered in collecting the data. There are important differences, for example, between a case study that reports the anecdotes of a handful of respondents and a survey that collects data from several thousand people.

- **Are the results presented fairly?** It is necessary to assess statements on the basis of the actual data they reflect and their logic. For instance, when the manufacturer of car X boasts that “no other car has a better safety record than car X,” this does not mean that car X is safer than every other car. It just means that no other car has been proved safer, though many other cars could be just as safe as car X. Expressed in the latter fashion, the finding doesn’t seem as worth bragging about.

These three basic questions can help you assess the validity of research findings you come across—both within and outside the field of psychology. The more you know how to evaluate research in general, the better you’ll be able to assess what the field of psychology has to offer.
1. We can study some phenomena in animals more easily than we can in people because animal subjects are more uniform and we can use a larger number of similar subjects.

2. (1) We can study some phenomena in animals more easily than we can in people, because with animal subjects we have greater control over environmental and genetic factors. (2) Large numbers of similar participants can be easily obtained. (3) We can look at generational effects much more easily in animals, because of their shorter life span, than we can with people; nonetheless, the benefits of using animals in research have been profound.

3. There are far too few participants. Without a larger sample, no valid conclusions can be drawn about ice cream preferences based on gender.

4. List three benefits of using animals in psychological research.

5. According to a report, a study has shown that men differ from women in their preference for ice cream flavors. This study was based on a sample of two men and three women. What might be wrong with this study?

1. Ethical research begins with the concept of informed consent. Before signing up to participate in an experiment, participants should be informed of:
   a. the procedure of the study, stated generally.
   b. the risks that may be involved.
   c. their right to withdraw at any time.
   d. all of the above.

2. List three benefits of using animals in psychological research.

3. Deception is one means experimenters can use to try to eliminate participant expectations. True or false?

4. A false treatment, such as a pill that has no significant chemical properties or active ingredient, is known as a __________.

5. According to a report, a study has shown that men differ from women in their preference for ice cream flavors. This study was based on a sample of two men and three women. What might be wrong with this study?

1. A researcher strongly believes that college professors tend to show female students less attention and respect in the classroom than they show male students. He sets up an experimental study involving observations of classrooms in different conditions. In explaining the study to the professors and students who will participate, what steps should the researcher take to eliminate experimental bias based on both experimenter and participant expectations?

2. From a research analyst’s perspective: You are hired to study people’s attitudes toward welfare programs by developing and circulating a questionnaire via the Internet. Is this study likely to accurately reflect the views of the general population? Why or why not?
Psychology on the Web

1. Practice using several search strategies to find information on the Web about one of the key issues in psychology (e.g., free will versus determinism, nature versus nurture, or conscious versus unconscious determinants of behavior) using (a) a general-purpose search engine (such as Google at www.google.com) and (b) a more specialized search engine (such as Yahoo’s Psychology section under the “Social Science” heading at www.yahoo.com). Summarize and then compare the kinds of information you have found with each strategy.

2. Search the Web for discussions of youth violence and try to find (a) an article in the general news media, (b) information from a psychological point of view (e.g., experimental information or recommendations for parents from a professional organization), and (c) political opinion or debate about how to address the issue of youth violence.

Epilogue

The field of psychology, as we have seen, is broad and diverse. It encompasses many different subfields and specialties practiced in a variety of settings, with new subfields continually arising. We have also seen that even within the various subfields of the field, it is possible to adopt several different approaches, including the neuroscience, psychodynamic, behavioral, cognitive, and humanistic perspectives.

For all its diversity, though, psychology focuses on certain key issues that serve to unify the field along common lines and shared findings. These issues reappear as themes throughout this book as we discuss the work and accomplishments of psychologists in the many subfields of the discipline.

In light of what you’ve already learned about the field of psychology, reconsider the questions raised regarding the oil spill in the Gulf of Mexico and answer the following questions:

1. What kinds of factors might psychologists using the neuroscience perspective focus on to explain reactions to the oil spill?
2. How would developmental psychologists consider the effects of watching television news reports of the disaster on a child’s later development?
3. What aspects of the disaster would a clinical psychologist likely focus on?
4. How might social psychologists explore the helpfulness of people in providing aid to the victims of the disaster?