

PART ONE

General Issues



CHAPTER ONE

Introduction

CHAPTER OUTLINE

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Evaluating Research Findings Reported in the Media

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SUMMARY

THE SCIENCE OF PSYCHOLOGY

- Psychologists develop theories and conduct psychological research to answer questions about behavior and mental processes; these answers can impact individuals and society.
- The scientific method, a means to gain knowledge, refers to the ways in which questions are asked and the logic and methods used to gain answers.
- Two important characteristics of the scientific method are an empirical approach and a skeptical attitude.

It seems safe to assume that you've been exposed to many research findings in psychology, both in media presentations and in your psychology course work. If you are like the authors of your textbook, you are very curious about the mind and behavior. You like to think about people's (and animals') behavior. You wonder about people—why they act the way they do, how they became the people they are, and how they will continue to grow and change. And you may wonder about your own behavior and how your mind works. These thoughts and reflections set you apart from other people—not everyone is curious about the mind, and not everyone considers the reasons for behavior. But if you are curious, if you do wonder why people and animals behave the way they do, you have already taken the first step in the intriguing, exciting, and, yes, sometimes challenging, journey into research methods in psychology.

Many students enter the field of psychology because of their interest in improving people's lives. But what methods and interventions are helpful to people? For example, students with a career goal that involves conducting psychotherapy must learn to identify patterns of behavior that are maladaptive and to distinguish psychological interventions that are helpful from those that are not. Psychologists gain understanding and insight into the means for improving people's lives by developing theories and conducting psychological research to answer their questions about behavior.

Let us consider one very important research question among the many investigated by psychologists: What is the effect of violence in the media? Researchers have investigated aspects of this question for more than five decades in hundreds of research studies. A review of research on this topic appeared in *Psychological Science in the Public Interest* (Anderson et al., 2003), a psychology journal dedicated to publishing reports of behavioral research on important issues of public interest. Other recent topics in this journal include adolescent decision making (Reyna & Farfey, 2006), effective work groups and teams (Kozlowski & Ilgen, 2006), and methods for improving eyewitness evidence (Wells, Memon, & Penrod, 2006). Although these topics differ, the critical and common feature of research reported in this and other high-caliber psychology journals is the reliance on sound research design and methods to answer questions about behavior.

After decades of research, what do psychologists say about the behavioral, emotional, and social effects of media violence? Anderson et al. (2003) reported

several key findings in their review of research that investigated violence in television, films, video games, the Internet, and music:

- Exposure to media violence causes an increase in the likelihood of aggressive and violent thoughts, emotions, and behavior in short- and long-term contexts.
- The effects of violence in the media are consistent across a variety of research studies and methods, types of media, and samples of people.
- Recent long-term studies link frequent childhood exposure to media violence with adult aggression, including physical assaults and spouse abuse.
- Research evidence supports psychologists’ theories that media violence “activates” (primes) people’s aggressive cognitions and physiological arousal, facilitates people’s learning of aggressive behaviors through observation, and desensitizes people to violence.
- Factors that influence the likelihood of aggression in response to media violence include characteristics of viewers (e.g., age and extent to which they identify with aggressive characters), social environments (e.g., parental monitoring of media violence), and media content (e.g., realism of violent depictions and consequences of violence).
- No one* is immune to the effects of media violence.

A number of studies reveal that children and youth spend an inordinate amount of time as media consumers, possibly second only to sleeping (Lyle & Hoffman, 1972). Thus, an implication of the research findings listed is that one way to lessen the devastating impact of aggression and violence in our society is to decrease exposure to media violence. Indeed, psychological research played an important role in the development of the V-chip (the “V” stands for “Violence”) on televisions so that parents can block violent content (Anderson et al., 2003).

More research questions remain. One important question concerns the distinction between *passive* observation of violence (e.g., television depictions) and the *active* engagement with violent media that occurs with video and Internet games (Figure 1.1). Is it possible that the effects of media violence are even stronger when viewers are actively engaged with violence while playing video games? This might be the case if active involvement reinforces aggressive tendencies to a greater degree than does passive observation. Other research questions concern the steps needed to decrease the impact of violence in our society and the role that limiting violence in the media should play in a free society. Perhaps these questions will some day be *your* research questions, or perhaps you are interested in exploring the causes of drug addiction or the roots of prejudice. Literally thousands of important research questions remain. As you continue your study of research in psychology, one day you may contribute to psychologists’ efforts to improve our human condition!

Key Concept

Psychologists seek to answer questions about behavior, thoughts, and feelings by using the scientific method. The **scientific method** is an abstract concept that refers to the ways in which questions are asked and the logic and methods used to gain answers. Two important characteristics of the scientific

FIGURE 1.1 Does the effect of violent media differ for (a) passive television viewing versus (b) active video game performance?



(a)



(b)

method are the reliance on an empirical approach and the skeptical attitude scientists adopt toward explanations of behavior and mental processes. We will discuss these two characteristics as part of our introduction to psychological research in this chapter, and in Chapter 2 we will describe additional characteristics of the scientific method.

SCIENCE IN CONTEXT

- Science occurs in at least three contexts: historical, social-cultural, and moral contexts.

Although the concept of the scientific method may be abstract, the practice of psychological science is very much a concrete human activity that affects us on several levels. Psychologists can have an impact at the level of the individual (e.g., therapeutic intervention for aggression), the family (e.g., parental control over their children's media use), and society (e.g., efforts to decrease violent programming on television networks). *To be effective, however, psychologists must build upon a foundation of carefully designed and executed research.*

Human activities are influenced heavily by the context in which they occur, and scientific activity is no exception. We can suggest that at least three contexts play a critical role in influencing science: historical context, social-cultural context, and moral context. We will briefly describe each of these in turn.

Historical Context

- An empirical approach, which relies on direct observation and experimentation for answering questions, was critical for developing the science of psychology.
- The computer revolution has been a key factor in the shift from behaviorism to cognitive psychology as the dominant theme in psychological inquiry.

We don't really know exactly when psychology first became an independent discipline. Psychology emerged gradually, with roots in the thinking of Aristotle (Keller, 1937), in the writings of later philosophers such as Descartes and Locke and, later, in the work of early 19th-century physiologists and physicists. The official beginning of psychology is often marked as occurring in 1879 when Wilhelm Wundt established a formal psychology laboratory in Leipzig, Germany.

One of the decisions that faced early psychologists at the end of the 19th century concerned whether psychology should more closely affiliate with the physical sciences or remain a subdiscipline of philosophy (Sokal, 1992). With the development of psychophysical methods (especially Gustav Theodor Fechner) and reaction-time methods for understanding nervous system transmission (in particular, Hermann von Helmholtz), psychologists believed they could eventually measure thought itself (Coon, 1992). With these powerful methods of observation, psychology was on the way to becoming a quantifiable, laboratory-based science. Scientific psychologists hoped that their study of the mind would achieve equal prominence with the more established sciences of physics, chemistry, and astronomy (Coon, 1992).

One of the roadblocks to the emerging science of psychology was the public's strong interest in spiritualism and psychic phenomena at the turn of the 20th century (Coon, 1992). The general public viewed these topics of "the mind" to be within the province of psychology and sought scientific answers to their questions about clairvoyance, telepathy, and communication with the dead. However, many psychologists wished to divorce the young science from these

Key Concept

pseudoscientific topics. To establish psychology as a science, psychologists embraced empiricism as the means to advance understanding about human behavior. The **empirical approach** emphasizes direct observation and experimentation as a way of answering questions. It is perhaps the most important characteristic of the scientific method. Using this approach, psychologists focused on behaviors and experiences that could be *observed directly*.

Although psychology continues to emphasize the empirical approach, psychology has changed significantly since its beginnings. Early psychologists were primarily interested in questions of sensation and perception—for instance, visual illusions and imagery. In the early 20th century, psychology in the United States was heavily influenced by a behaviorist approach introduced by John B. Watson. Psychological theories focused on learning, and psychologists relied mostly on experiments with animals to test their theories. For behaviorism, the “mind” was a “black box” representing activity between an external stimulus and a behavioral response. Behaviorism was the dominant perspective in psychology well into the middle of the 20th century. Nevertheless, by the time Ulric Neisser’s *Cognitive Psychology* was published in 1967, psychology had turned again to an interest in mental processes. Cognitive psychologists also returned to the reaction-time experiments that were used in the early psychology laboratories to investigate the nature of cognitive processes. The cognitive perspective is still dominant in psychology, and cognition recently has been a major topic within the field of neuroscience as investigators study the biology of the mind. There is great potential for the development of scientific psychology in the early 21st century.

A significant factor in the rise to prominence of cognitive psychology was the computer revolution (Robins, Gosling, & Craik, 1999). With the advent of computers, behaviorism’s “black box” was represented using a computer metaphor. Psychologists spoke of information processing, storage, and retrieval between input (stimulus) and output (response). Just as the computer provided a useful metaphor for understanding cognitive processes, the continued development of readily available, powerful computers has proved to be exceptionally useful in broadening the scope and precision of measuring cognitive processes. Today in psychology laboratories throughout the United States and the world, computer technology is replacing paper-and-pencil measures of people’s thoughts, feelings, and behaviors. Similarly, continued improvements in the technology of brain imaging (e.g., fMRI, functional magnetic resonance imaging) will advance neuroscience as an important discipline within the fields of psychology, biology, and chemistry.

These broad trends in the historical development of psychology, from behaviorism to cognitive neuroscience, represent the “bigger picture” of what happened in psychology in the 20th century. A closer look, however, reveals the myriad topics investigated in the science of psychology. Psychologists today do research in such general areas as clinical, social, organizational, counseling, physiological, cognitive, educational, developmental, and health psychology. Investigations in all of these areas help us to understand the complexity of behavior and mental processes.

Science in general—and psychology in particular—has changed because of the brilliant ideas of exceptional individuals. The ideas of Galileo, Darwin, and

BOX 1.1

PSYCHOLOGY AND THE NOBEL PRIZE

Each year, the Royal Swedish Academy of Sciences awards the distinguished Nobel Prize for researchers' work in a variety of fields. In October 2002, Daniel Kahneman, Ph.D., became the first psychologist to win this award. He was recognized for his research on intuitive judgment, human reasoning, and decision making in conditions of uncertainty. His research, conducted with his long-term collaborator, Amos Tversky (1937–1996), was honored because of its influential role in economic theories (Kahneman, 2003). Kahneman shared the Nobel Economics Prize with economist Vernon Smith, who was cited for his work in developing laboratory experiments (an important topic in this text) in economics.

Although trained in fields other than psychology, several scientists have been awarded the Nobel Prize for research directly related to the behavioral sciences (Chernoff, 2002; Pickren, 2003), for example:

- **1904**, Physiology or Medicine: Ivan Pavlov won the Nobel Prize for his research on digestion, which subsequently influenced his work on classical conditioning.
- **1961**, Physiology or Medicine: A physicist, Georg von Békésy, won the Nobel Prize for his work on psychoacoustics—the perception of sound.
- **1973**, Physiology or Medicine: Three ethologists, Karl von Frisch, Konrad Lorenz, and Nikolaas Tinbergen, were honored with the first Nobel Prize awarded for purely behavioral research (Pickren, 2003). Ethology is a branch of biology in which researchers observe behavior of organisms in relation to their natural environment (see Chapter 4).
- **1978**, Economics: Herbert A. Simon was awarded the Nobel Prize for his groundbreaking research on organizational decision making (MacCoun, 2002; Pickren, 2003). Kahneman, referring to his 2002 Nobel Prize, cited Simon's research as instrumental for his own research.



- **1981**, Physiology or Medicine: The Nobel Prize was awarded to Roger W. Sperry, a zoologist who demonstrated the distinct roles of the two brain hemispheres using the “split-brain” procedure.

The achievements of these scientists and many others testify to the breadth and importance of behavioral research in the sciences. Although there is not a “Nobel Prize for Psychology” (a distinction shared by the field of Mathematics), the work of scientists in a variety of areas is recognized as contributing to our understanding of behavior.

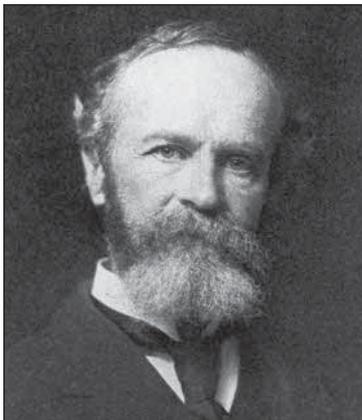
Einstein not only changed the way scientists viewed their disciplines, but their ideas also changed the way people understand themselves and their world. Similarly, many exceptional individuals have influenced the progress of psychology (Haggbloom et al., 2002), including Nobel Prize winners (see Box 1.1). Early in American psychology, William James (1842–1910) wrote the first

introductory textbook, *The Principles of Psychology*, and gained insight into mental processes using his technique of introspection. As the prominence of behaviorism grew, B. F. Skinner (1904–1995) expanded our understanding of responses to reinforcement through the experimental analysis of behavior. Along with Skinner, Sigmund Freud (1856–1939) is often one of the most recognized figures in psychology, but the ideas and methods of the two could not be more different! Freud’s theories on personality, mental disorders, and the unconscious dramatically shifted attention from behavior to mental processes through his method of free association. Many other individuals greatly influenced thinking within specific areas of psychology, such as developmental, clinical, social, and cognitive psychology. We hope you will be able to learn more about these influential psychologists, from both the past and the present, in the areas of most interest to you.

Science also changes less dramatically, in ways that result from the cumulative efforts of many individuals. One way to describe these more gradual changes is by describing the growth of the profession of psychology. The American Psychological Association (APA) was formed in 1892. The APA had only a few dozen members in that first year; in 1992, when the APA celebrated its 100th birthday, there were approximately 70,000 members. Fifteen years later, in 2007, APA membership doubled to over 148,000 members. Promotion of psychological research is a concern of the APA as well as the Association for Psychological Science (APS). APS was formed in 1988 to emphasize scientific issues in psychology. APA and APS both sponsor annual conventions, which psychologists attend to learn about the most recent developments in their fields. Each organization also publishes scientific journals in order to communicate the latest research findings to its members and to society in general.

You can become part of psychology’s history in the making. Both APA and APS encourage student affiliation, which provides educational and research opportunities for both undergraduate and graduate psychology students.

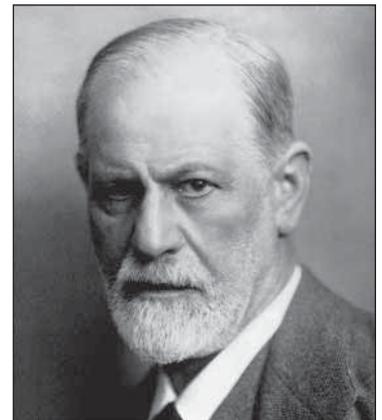
FIGURE 1.2 Many influential people helped to develop the field of psychology, including (a) William James, (b) B. F. Skinner, and (c) Sigmund Freud.



(a)



(b)



(c)

Information about joining APA and APS as a regular member or as a student affiliate can be obtained by consulting their Internet websites:

(APA) www.apa.org

(APS) www.psychologicalscience.org

Both the APA and APS websites provide news about important recent psychological research findings, information about psychology publications (including relatively low-cost student subscription rates for major psychology journals), and links to many psychology organizations. Take a look!

Social and Cultural Context

- The social and cultural context influences researchers' choice of topics, society's acceptance of findings, and the locations in which research takes place.
- Ethnocentrism occurs when people's views of another culture are biased by the framework or lens of their own culture.

Science is influenced not only by its historical context but also by the prevailing social and cultural context. This prevailing context is sometimes referred to as the *zeitgeist*—the spirit of the times. Psychological research and its application exist in a reciprocal relationship with society: research has an effect on and is affected by society. The social and cultural context can influence what researchers choose to study, the resources available to support their research, and society's acceptance of their findings. For example, researchers have developed new research programs because of an increasing emphasis on women's issues (and because of increasing numbers of women doing research). Topics in this emerging area include the "glass ceiling" that impedes women's advancement in organizations, the interplay between work and family for dual-career couples, and the effects of the availability of quality child care on productivity in the workforce and on children's development. Social and cultural attitudes can affect not only what researchers study but how they choose to do their research. Society's attitude toward bilingualism, for instance, can affect whether researchers emphasize *problems* that arise for children in bilingual education or the *benefits* that children gain from bilingual education.

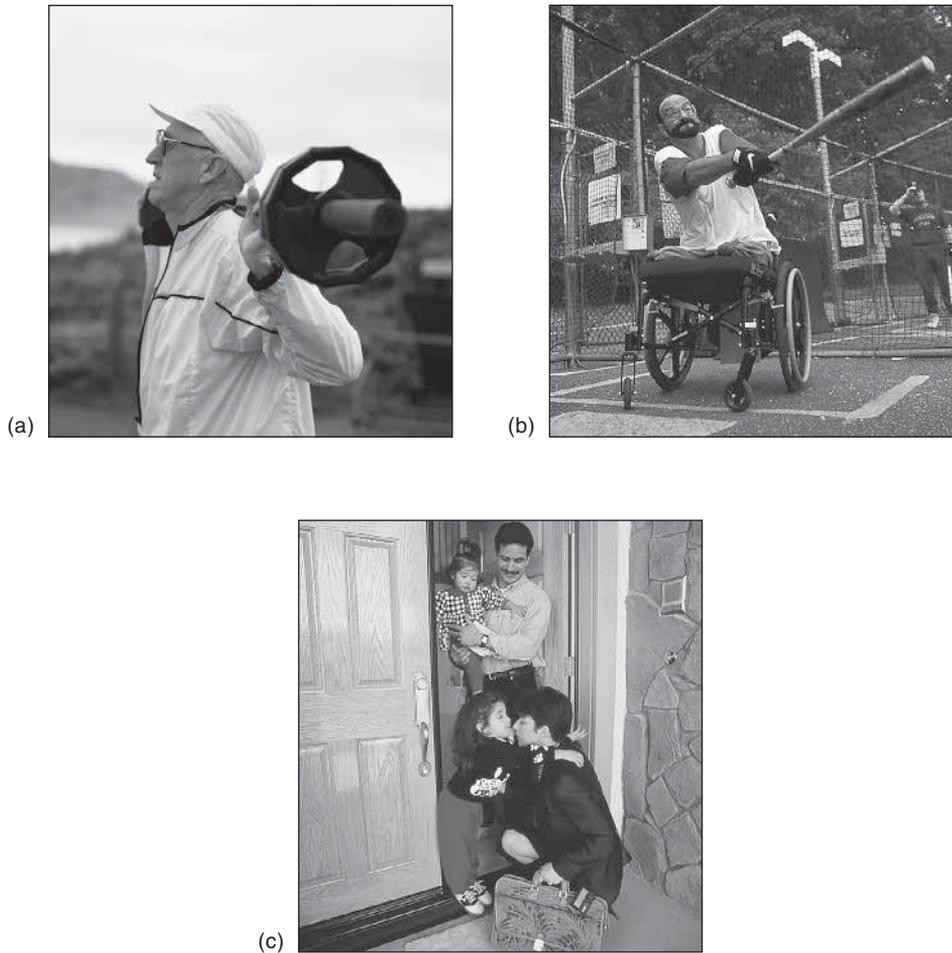
Social and cultural values can affect how people react to reported findings from psychological research. For example, reports of research on controversial topics such as sexual orientation, recovered memories of childhood sexual abuse, and televised violence receive more media attention because of the public's interest in these issues. At times, this greater interest engenders public debate about the interpretation of the findings and the implications of the findings for social policy. Public reaction can be extreme, as illustrated by the response to an article on child sexual abuse published in *Psychological Bulletin* (Rind, Tromovitch, & Bauserman, 1998). In their review and analysis of 59 studies of the effects of child sexual abuse (CSA), Rind et al. concluded that "CSA does not cause intense harm on a pervasive basis regardless of gender in the college population" (p. 46). After their research was promoted by pedophilia advocacy sites on the Web, "Dr. Laura" (talk show host, Laura Schlessinger) characterized

the article as endorsing adult sex with children (*not* the investigators' intention) and criticized the American Psychological Association for publishing the study in its prestigious journal, *Psychological Bulletin* (Ondersma et al., 2001). In 1999 the U.S. House of Representatives responded to negative media attention by passing unanimously a resolution of censure of the research reported in this article. Also, scientific debate over the controversial findings continues, with criticisms and rebuttals appearing in *Psychological Bulletin* (Dallam et al., 2001; Ondersma et al., 2001; Rind, Tromovitch, & Bauserman, 2001), other journals, and books. Such public criticisms of research findings, even findings based on solid, empirical science, appear to be a growing trend. Legal, administrative, and political attacks arise from those who oppose research findings because of strongly held personal beliefs or financial interests (Loftus, 2003). These attacks can have the unfortunate consequence of impeding legitimate scientific inquiry and debate.

Psychologists' sensitivity to societal concerns, such as child sexual abuse, is one reason why psychology has not developed strictly as a laboratory science. Although laboratory investigation remains at the heart of psychological inquiry, psychologists and other behavioral scientists do research in schools, clinics, businesses, hospitals, and other nonlaboratory settings, including the Internet. In fact, the Internet is becoming a useful and popular research tool for psychological scientists (e.g., Birnbaum, 2000). According to U.S. Census data, by the year 2000, 54 million U.S. households (51%) had one or more computers. In 44 million households (42%) there was at least one person who used the Internet at home (Newburger, 2001). These data obviously underestimate the number of U.S. Internet users since numbers refer to households and not individual users, and they do not consider online access through business or educational settings. Importantly, these figures also do not take into account the use of the Internet in countries other than the United States. In March 2007 there were an estimated 1 billion worldwide Internet users (www.internetworldstats.com). Suffice it to say, it did not take behavioral scientists very long to recognize the potential of an amazingly large and diverse "participant pool" for their research (see, for example, Birnbaum, 2000; Gosling, Vazire, Srivastava, & John, 2004; Skitka & Sargis, 2005). Aided by the development of the Internet in the 1990s and associated hypertext markup languages (HTML), psychologists soon began to carry out online research (e.g., Musch & Reips, 2000). The Web allows practically any type of psychological research that uses computers as equipment and humans as participants (Krantz & Dalal, 2000). One way that researchers recruit participants for their studies is to post research opportunities on various research-based websites. For example, APS maintains a Web page that allows Internet users to participate in psychological research. Check out Internet research opportunities at <http://psych.hanover.edu/research/exponnet.html>. We will have much more to say about research on the Internet as we introduce you to particular research methods in psychology. Of particular importance are ethical issues raised by this form of research (see Chapter 3).

If we acknowledge that science is affected by social and cultural values, a question still remains as to whose culture is having—and whose culture should have—an influence. A potential problem occurs when we attempt to understand

FIGURE 1.3 By removing our cultural lenses, we gain new ideas for research topics that investigate (a) strengths in aging, (b) abilities rather than disabilities, and (c) nurturing fathers and career mothers.



Key Concept

the behavior of individuals in a *different* culture through the framework or views of our *own* culture (Figure 1.3). This potential source of bias is called **ethnocentrism**. As an example of ethnocentrism, let's consider the controversy concerning theories of moral development. In his six-stage theory of moral development, Kohlberg (1981, 1984) identified the highest stage of moral development (postconventional development) as one in which individuals make moral decisions based on their self-defined ethical principles and their recognition of individual rights. Research evidence suggests that Kohlberg's theory provides a good description of moral development for American and European males—cultures emphasizing individualism. In contrast, people who live in cultures that emphasize collectivism, such as communal societies in China or Papua, New Guinea, do not fit Kohlberg's description. Collectivist cultures value the

well-being of the community over that of the individual. We would be demonstrating ethnocentrism if we were to use Kohlberg's theory to declare that individuals from such collectivist cultures were less morally developed. We would be interpreting their behavior through an inappropriate cultural lens, namely, individualism. Cross-cultural research is one way to help us avoid studying only one dominant culture and to remind us that we need to be careful to use cultural lenses beyond our own in our research.

Moral Context

- The moral context of research demands that researchers maintain the highest standards of ethical behavior.
- The APA's code of ethics guides research and helps researchers to evaluate ethical dilemmas such as the risks and benefits associated with deception and the use of animals in research.

Science is a search for truth. Individual scientists and the collective enterprise of science need to ensure that the moral context in which scientific activity takes place meets the highest of standards. Fraud, lies, and misrepresentations should play no part in a scientific investigation. But science is also a human endeavor, and frequently much more is at stake than truth. Both scientists and the institutions that hire them compete for rewards in a game with jobs, money, and reputations on the line. The number of scientific publications authored by a university faculty member, for instance, is usually a major factor influencing decisions regarding professional advancement through promotion and tenure. Under these circumstances, there are unfortunate, but seemingly inevitable, cases of scientific misconduct.

A variety of activities constitute violations of scientific integrity. They include fabrication of data, plagiarism, selective reporting of research findings, failure to acknowledge individuals who made significant contributions to the research, misuse of research funds, and unethical treatment of humans or animals (see Adler, 1991). Some transgressions are easier to detect than others. Out-and-out fabrication of data, for instance, can be revealed when, in the normal course of science, independent researchers are not able to reproduce (replicate) results, or when logical inconsistencies appear in published reports. However, subtle transgressions, such as reporting only data that meet expectations or misleading reports of results, are difficult to detect. The dividing line between intentional misconduct and simply bad science is not always clear.

To educate researchers about the proper conduct of science, and to help guide them around the many ethical pitfalls that are present, most scientific organizations have adopted formal codes of ethics. In Chapter 3 we will introduce you to the APA ethical principles governing research with humans and animals. As you will see, ethical dilemmas often arise. Consider research by Klimesmith, Kasser, and McAndrew (2006), who tested whether male participants who handled a gun in a laboratory setting were subsequently more aggressive. Researchers told participants the experiment investigated whether paying attention to details influences sensitivity to tastes. Participants were randomly assigned to one of two attention conditions. In one group each participant

handled a gun and wrote a set of instructions for assembling and disassembling the gun. In a second condition participants wrote similar instructions while interacting with the game Mouse Trap™. Afterward, each participant was asked to taste and rate a sample of water (85 g) with a drop of hot sauce in it, ostensibly prepared by the previous research participant. This was the “taste sensitivity” portion of the experiment. Next, participants were given water and hot sauce and asked to prepare the sample for the next participant. How much hot sauce they added served as the measure of aggression. Consistent with their predictions, the researchers found that participants who had handled the gun added significantly more hot sauce to the water ($M = 13.61$ g) than participants who interacted with the game ($M = 4.23$ g).

This research raises several important questions: Under what conditions should researchers be allowed to deceive research participants about the true nature of the experiment? Does the benefit of the information gained about guns and aggression outweigh the risk associated with deception? Would participants who handled the gun have added less hot sauce if they had known the experiment actually investigated the relationship between guns and aggression?¹

Deception is just one of the many ethical issues that researchers must confront. As yet another illustration of ethical concerns, consider that animal subjects sometimes are used to help understand human psychopathology. This may mean exposing animal subjects to stressful and even painful conditions, and sometimes killing the animals for postmortem examinations. Under what conditions should psychological research with animal subjects be permitted? The list of ethical questions raised by psychological research is a lengthy one. Thus, it is of the utmost importance that you become familiar with the APA ethical principles and their application at an early stage in your research career, and that you participate (as research participant, assistant, or principal investigator) only in research that meets the highest standards of scientific integrity. Our hope is that your study of research methods will allow you to do good research and to discern what research is good to do.

THINKING LIKE A RESEARCHER

- To “think like a researcher” is to be skeptical regarding claims about the causes of behavior and mental processes, even those that are made on the basis of “published” scientific findings.
- The strongest evidence for a claim about behavior comes from converging evidence across many studies, although scientists recognize that claims are always probabilistic.

One important step a student of psychology must make is to learn to think like a researcher. More than anything else, scientists are skeptical. A skeptical

¹A critical component of any research that uses deception is the *debriefing* procedure at the end of the experiment during which the true nature of the experiment is explained to participants (see Chapter 3). Participants in the Klimesmith et al. (2006) study were told the experiment investigated aggression, not taste sensitivity, and that they should not feel badly about any aggressive behavior they exhibited. None of the participants reported suspicion about the true nature of the experiment during the debriefing. Interestingly, Klimesmith et al. noted that some participants were disappointed their hot-sauce sample would not be given to the next participant!

attitude regarding claims about the causes of behavior and mental processes is another important characteristic of the scientific method in psychology. Not only do scientists want to “see it before believing it,” but they are likely to want to see it again and again, perhaps under conditions of their own choosing. Researchers strive to draw conclusions based on empirical evidence rather than their subjective judgment. The strongest scientific evidence is converging evidence obtained across different studies examining the same research question. Behavioral scientists are skeptical because they recognize that behavior is complex and often many factors interact to cause a psychological phenomenon. Discovering these factors is often a difficult task. The explanations proposed are sometimes premature because not all factors that may account for a phenomenon have been considered or even noticed. Behavioral scientists also recognize that science is a human endeavor. People make mistakes. Human inference is not always to be trusted. Therefore, scientists tend to be skeptical about “new discoveries” and extraordinary claims, even those that are from “published” research studies.

The skepticism of scientists leads them to be more cautious than many people without scientific training. Many people are apparently all too ready to accept explanations that are based on insufficient or inadequate evidence. This is illustrated by the widespread belief in the occult. Rather than approaching the claims about paranormal events cautiously, many people accept these claims uncritically. According to public opinion surveys, a large majority of Americans believe in ESP (extrasensory perception), and some people are convinced that beings from outer space have visited earth. About two in five Americans believe horoscopes are credible, and as many as 12 million adults report changing their behavior after reading astrology reports (Miller, 1986). Such beliefs are held despite minimal and often negative evidence for the validity of horoscopes.

Scientists do not, of course, automatically assume that unconventional interpretations of unexplained phenomena could not be true. They simply insist on being allowed to test all claims and to reject those that are inherently untestable. Scientific skepticism is a gullible public’s defense against charlatans and others who would sell them ineffective medicines and cures, impossible schemes to get rich, and supernatural explanations for natural phenomena. At the same time, however, it is important to remember that trust plays as large a role as skepticism in the life of a scientist. Scientists need to trust their instruments, their participants, their colleagues’ reports of research, and their own professional judgment in carrying out their research.

We’ve indicated that to think like a researcher you need to be skeptical about evidence and claims. You already know something about evidence and claims if you’ve read any book detailing a crime and trial, or watched any number of popular movie or television legal dramas. Detectives, lawyers, and others in the legal profession collect evidence from a variety of sources and seek converging evidence in order to make claims about people’s behavior. A small amount of evidence may be enough to *suspect* someone of a crime, but converging evidence from many sources is needed to *convict* the person.

Psychological scientists work in much the same way—they collect evidence in order to make claims about behavior and psychological processes. Consider

these statements and decide what kinds of evidence you think are implied by each statement.

1 In a *survey* of U.S. adults, 96% of married people reported they had been faithful to their spouse during the past year.

2 Research has shown that whether a teen begins to smoke is more *related* to whether the teen’s friends smoke than to whether the teen’s parents smoke.

3 Experimental research demonstrates that writing about emotional experiences associated with beginning college (compared with writing about superficial events) *causes* college students to have better health and academic outcomes.

4 Over many *replications* (repetitions) of the same false-memory experiment, researchers consistently found that about three fourths of the time participants falsely remembered that certain words were presented when, in fact, the words were never presented in the experiment.

You likely noticed that these four statements cover a range of research topics in psychology, from marital fidelity to the formation of false memories. The measures (e.g., surveys, smoking rates, health and academic outcomes, false memories) that researchers use to gather evidence vary because of the specific area of psychology they are investigating. As you considered the four research statements, you may have noticed that they also varied in terms of the extent and quality of the evidence. Just as legal professionals must have different types of evidence to suspect *versus* convict a person of a crime, researchers must have different types of evidence to *describe* behavior *versus* state they’ve identified factors that *cause* a behavior to occur.

As you proceed in your study of research methods, you will find that there are important—and different—scientific principles that apply to reporting a survey statistic or behavioral observation, identifying a relationship between factors (or “variables”), and stating there is a causal link between variables. The main emphasis of this text will be to detail the different research methods that result in different types of evidence and conclusions. The strongest scientific evidence is akin to the converging evidence needed in a trial to obtain a conviction. For instance, when the same procedure is used to induce false memories in several experiments with different participants and equivalent results are obtained, our confidence in the conclusion that people can form false memories is increased. Even when researchers have strong evidence for their conclusions from replications of an experiment, they are in a similar situation as juries that have found a person guilty beyond a reasonable doubt. Researchers and juries both seek the truth, but their conclusions are ultimately probabilistic. Certainty is often beyond the grasp of both jurors and scientists.

While you were considering the evidence described in the four research statements, you may have found yourself reacting to the findings. Perhaps you were encouraged by the high rate of reported marital fidelity, or perhaps you found it hard to believe that marital fidelity could be so high. If so, you are already beginning to think like a researcher. Like detectives, researchers follow hunches and leads as they seek evidence in support of the theories they are testing. However, jurors and researchers also develop preconceptions and initial

STRETCHING EXERCISE

Consider the type of evidence that is demonstrated in each of the four research statements in the left column. Match each statement to the type of evidence listed in the right column. Which

research statements do you find convincing, and why? Citations to the original articles are included so you can read more about the research studies. Answers may be found at the end of the chapter.

Research Statement

- 1 Mimicking the behavior and posture of participants in a study caused the participants subsequently to be more helpful, compared to participants who were not mimicked.
- 2 A review of research indicated that several types of treatments have been shown to be effective in treating depression, including medication, interpersonal psychotherapy, and cognitive behavior therapy.
- 3 Based on analysis of traffic fatalities between 1996 and 2000, an estimated 353 additional fatalities occurred in the 3 months following September 11, 2001, perhaps because people avoided air travel.
- 4 Adolescent girls in grades 7 and 8 who perceived a strong pressure to be thin were more likely to be dissatisfied with their body when questioned one year later.

References

- 1 van Baaren, R. B., Holland, R. W., Kawakami, K., & van Knippenberg, A. (2004). Mimicry and prosocial behavior. *Psychological Science, 15*, 71–74.
- 2 Hollon, S. D., Thase, M. E., & Markowitz, J. C. (2002). Treatment and prevention of depression. *Psychological Science in the Public Interest, 3*, 39–77.

Type of Evidence

- a Converging findings across studies
- b Observation of events
- c Cause-and-effect relationship
- d Relationship between two variables

- 3 Gigerenzer, G. (2004). Dread risk, September 11, and fatal traffic accidents. *Psychological Science, 15*, 286–287.
- 4 Stice, E., & Whitenton, K. (2002). Risk factors for body dissatisfaction in adolescent girls: A longitudinal investigation. *Developmental Psychology, 38*, 669–678.

impressions that can result in biased judgments as they evaluate the evidence. But, legal decisions and research conclusions are ultimately supposed to be based on the evidence and not on our subjective judgments. Researchers use the scientific method to constrain their subjective judgment and to draw appropriate conclusions based on the evidence.

By learning to think like a researcher, you can develop two important sets of skills. The first skill will enable you to be a more effective consumer of scientific findings so that you can make more informed personal and professional decisions. The second skill will enable you to learn how to do research so that you can contribute to the science of psychology. We will be fleshing out these two aspects of the scientific method throughout the text, but we briefly outline them in this chapter. We first describe an illustration of why it is important to think like a researcher when evaluating research claims made in the media. We then describe how researchers get started when they want to gather evidence using the scientific method.

Evaluating Research Findings Reported in the Media

- Not all science reported in the media is “good science.” We must question what we read and hear.
- Media reports summarizing original research reports may omit critical aspects of the method, results, or interpretation of the research.

Researchers in psychology report their findings in professional journals that are available in printed and electronic form. Most people who encounter psychological research findings, however, do so by learning about research findings in the media—on the Internet, in newspapers and magazines, and on radio and TV. Much of this research is worthwhile. Psychological research can help people in a variety of areas, such as helping people to learn ways to communicate with a relative with Alzheimer’s, to avoid arguments, or to learn how to forgive. Two serious problems can arise, however, when research is reported in the media. The first problem is that the research reported in the media is not always good research. A critical reader needs to sort out the good research from the bad—what are solid findings and which have not yet been confirmed. We must also decide which findings are worth applying in our lives and which require a wait-and-see attitude. It is fair to say that much of the research is not very good given all the different media in which psychological research is reported. So we have good reason to question the research we read or hear about in the media.

A second problem that can arise when scientific research is reported in the media is that “something can be lost in the translation.” Media reports are typically summaries of the original research, and critical aspects of the method, results, or interpretation of the research may be missing in the media summary. The more you learn about the scientific method, the better your questions will be for discerning the quality of research reported in the media and for determining the critical information that is lacking in the media report. For now, we can give you a taste of the types of questions you will want to ask by looking at an example of research reported in the media.

Not too long ago there was a widely publicized phenomenon called the “Mozart effect.” Headlines such as “Classical Music Good for Babies’ Brains” were common at the time. These headlines caught people’s attention, especially the attention of new parents. Media reports indicated that parents were playing classical music to infants in the hope of raising their children’s intelligence. One million new mothers were given a free CD called “Smart Symphonies” along with free infant formula. Clearly the distributors and many new parents were persuaded that the Mozart effect was real.

The idea that listening to music might raise the intelligence scores of newborns is an intriguing idea. When you encounter intriguing ideas in the media such as this one, a good first step is to *go to the original source in which the research was reported*. In this case the original article was reported in a respectable journal, *Nature*. Rauscher, Shaw, and Ky (1993) described an experiment in which a single group of college students listened to a 10-minute Mozart piece, sat in silence for 10 minutes, or listened to relaxation instructions for 10 minutes before taking a spatial reasoning test. Performance on the test was better after

listening to Mozart than in the other two conditions, but the effect disappeared after an additional 10- to 15-minute period.

The findings reported in the original source may be judged as solid, but the extrapolations of these findings are very shaky. A million women were being encouraged to play “smart symphonies” for their infants on the basis of an effect demonstrated on a very specific type of reasoning test with college students and the effect lasted 15 minutes at the most! Although some studies with children were done, the ambiguous results of all the research studies indicate that something had been lost in the “translation” (by the media) from the original research reports to the widespread application of the Mozart effect. People who are skeptical enough to ask questions when they hear or read reports of research in the media and knowledgeable enough to read research in the original sources are less likely to be misinformed. Your job is to be skeptical; our job is to provide the knowledge in this text to allow you to read critically original sources that report research findings.

Getting Started Doing Research

- When beginning a research study, students can answer the first question of “what to study?” by reviewing psychological topics in psychology journals, textbooks, and courses.
- A research hypothesis is a tentative explanation for a phenomenon; it is often stated in the form of a prediction together with an explanation for the predicted outcome.
- Researchers generate hypotheses in many ways, but they always review published psychological studies before beginning their research.
- To decide if their research question is a good one, researchers consider the scientific importance, scope, and likely outcomes of the research, and whether psychological science will be advanced.
- A multimethod approach, one that searches for answers using various research methodologies and measures, is psychology’s best hope for understanding behavior and the mind.

As you begin learning about how researchers in psychology gather evidence, we will pass along advice from several expert researchers about one of the most fundamental aspects of research—getting started. We will organize this section around three questions that researchers ask themselves as they begin a research project:

- What should I study?
- How do I develop a hypothesis to test in my research?
- Is my research question a good one?

There are many decisions that must be made before beginning to do research in psychology. The first one, of course, is what topic to study. Many students approach the field of psychology with interests in psychopathology and issues associated with mental health. Others are intrigued with the puzzles surrounding human cognition, such as memory, problem solving, and decision making. Still others are interested in problems of developmental and social psychology.

Psychology provides a smorgasbord of research possibilities to explore, as is illustrated by the literally hundreds of scientific journals that publish the results of psychological research. You can quickly find information about the many research areas within psychology by reviewing the contents of a standard introductory psychology textbook. More specific information can be found, of course, in the many classes offered by the psychology department of your college or university, such as abnormal psychology, cognitive psychology, and social psychology.

Students often develop their initial research topics through interactions with their psychology instructors. Many professors conduct research and are eager to involve students on research teams. You may only need to ask. Psychology departments also offer many other resources to help students develop research ideas. One opportunity is in the form of “colloquia” (singular: colloquium). A colloquium is a formal research presentation in which researchers, sometimes from other universities, present their theories and research findings to faculty and students in the department. Watch for announcements of upcoming colloquia in your psychology department.

Key Concept

The next decision is a bit harder. As researchers get started, they seek to identify their research hypothesis. A **hypothesis** (plural: hypotheses) is a tentative explanation for a phenomenon. Often a hypothesis is stated in the form of a prediction for some outcome, along with an explanation for the prediction. We proposed a research hypothesis earlier when we suggested that the effects (e.g., increased aggression) of violent media may be stronger for video games than for passive television viewing because players are actively engaged in the aggressive actions, thus increasing their aggressive tendencies. (An alternative hypothesis might suggest that the effects of video games might be *less* because game players have the opportunity to release the aggressive impulses that passive television viewers do not.)

McGuire (1997) identified 49 simple rules (“heuristics”) for generating a hypothesis to be tested scientifically. We cannot review all 49 suggestions here, but we can give you some insight into McGuire’s thinking by listing some of these heuristics. He suggests, for example, that we might generate a hypothesis for a research study by

- thinking about deviations (oddities, exceptions) from a general trend or principle;
- imagining how we would behave in a task or if faced with a specific problem;
- considering similar problems whose solution is known;
- making sustained, deliberate observations of a person or phenomenon (e.g., performing a “case study”);
- generating counterexamples for an obvious conclusion about behavior;
- borrowing ideas or theories from other disciplines.

No matter how or where you begin to develop a hypothesis for your research, at some point you will need to explore the published literature of psychological research. There are several reasons why you must search the psychology literature before beginning to do research. One obvious reason is that the answer to

your research question may already be there. Someone else may have entertained the same question and provided an answer, or at least a partial one. It is very likely that you will discover research findings that are related to your research question. Although you may be disappointed to find your research question has been explored, consider that finding other people who have done research on the same or similar idea affirms the importance of your idea. Doing research without a careful examination of what is already known may be interesting or fun (it certainly may be easy); perhaps you could call it a “hobby,” but we can’t call it science. *Science is a cumulative enterprise—current research builds on previous research.*

Once you have identified a body of literature related to your research idea, your reading may lead you to discover inconsistencies or contradictions in the published research. You may also find that the research findings are limited in terms of the nature of the participants studied or the circumstances under which the research was done, or that there is a psychological theory in need of testing. Having made such a discovery, you have found a solid research lead, a path to follow.

When reading the psychological literature and thinking about possible research questions, you might also consider how the results of psychological studies are applied to societal problems. As you learn how to do research in psychology, you may consider ways this knowledge can be used to generate research investigations that will make humankind just a little better off.

Searching the psychological literature is not the tedious task that it once was; computer-aided literature searches, including use of the Internet, have made identifying psychological research a relatively easy, even exciting task. In Chapter 14 of this book, we outline how to search the psychology literature, including ways to use computer databases for your search.

Finally, as Sternberg (1997) points out, choosing a question to investigate should not be taken lightly. Some questions are simply not worth asking because their answers offer no hope of advancing the science of psychology. The questions are, in a word, meaningless, or at best, trivial. Sternberg (1997) suggests that students new to the field of psychological research consider several questions before deciding they have a good research question:

- Why might this question be scientifically important?
- What is the scope of this question?
- What are the likely outcomes if I carry out this research project?
- To what extent will psychological science be advanced by knowing the answer to this question?
- Why would anyone be interested in the results obtained by asking this question?

As you begin the research process, finding answers to these questions may require guidance from research advisors and others who have successfully conducted their own research. We also hope that your ability to answer these questions will be enhanced as you learn more about theory and research in psychology, and as you read about the many examples of interesting and meaningful psychological research that we describe in this book.

Of course, identifying a research question doesn’t necessarily tell you how to do the research. What is it exactly that you want to know? Answering this

question will mean that you must make other decisions that we will address throughout this text. As a researcher, you will ask yourself questions such as “Should I do a qualitative or quantitative research study? What is the nature of the variables I wish to investigate? How do I find reliable and valid measures of behavior? What is the research method best suited to my research question? What kinds of statistical analyses will be needed? Do the methods I choose meet accepted moral and ethical standards? These and other steps associated with the scientific process are illustrated in Table 1.1. Don’t be concerned if the terms in these questions and in Table 1.1 are unfamiliar. As you proceed through this text on research methods in psychology, you will learn about these steps of the

TABLE 1.1 STEPS OF THE RESEARCH PROCESS

Step	How?	Chapter
Develop a research question.	• Be aware of ethnocentrism.	1
	• Gain personal experiences doing research.	1
Generate a research hypothesis.	• Read psychological literature.	1, 14
	• Read psychological theories on your topic.	1, 2
	• Consider personal experience, think of exceptions, and notice inconsistencies in previous research.	1
Form operational definitions.	• Look to previous research to see how others have defined the same or similar constructs.	2
Choose a research design.	• Identify the variables you will examine.	2
	• Identify a sample of participants.	4, 5
	• Decide whether your research question seeks to describe, allow prediction, or identify causal relationships.	2
	➤ Choose observational and correlational designs for description and prediction.	4, 5, 6
	➤ Choose an experimental design for a causal research question.	7, 8, 9
	➤ Choose a single-case design when seeking to understand and treat a small group or one individual.	10
Evaluate the ethics of your research.	• Choose a quasi-experimental design for a causal research question in settings where experimental control is less feasible.	11
	• Identify the potential risks and benefits of the research and the ways in which participants’ welfare will be protected.	3
	• Submit a proposal to an ethics review committee.	3
Collect and analyze data; form conclusions.	• Seek permission from those in authority.	3, 11
	• Get to know the data.	12
	• Summarize the data.	12
	• Confirm what the data reveal.	13
Report research results.	• Present the findings at a psychology conference.	14
	• Submit a written report of the study to a psychology journal.	14

research process. Table 1.1 will be a useful guide when you begin conducting your own research.

Key Concept

This text introduces you to the ways in which psychologists use the scientific method. As you know, psychology is a discipline with many areas of study and many questions. No single research methodology can answer all the questions psychologists have about behavior and mental processes. Thus, the best approach to answering our questions is the **multimethod approach**—that is, searching for an answer using various research methodologies and measures of behavior. The goal of this book is to help you to fill a “toolbox” with strategies for conducting research. As you will learn throughout this text, any one method or measure of behavior may be flawed or incomplete in its ability to answer research questions fully. When researchers use multiple methods, the flaws associated with any particular method are surmounted by other methods that “fill in the gaps.” Thus, an important advantage of the multimethod approach is that researchers obtain a more complete understanding of behavior and mental processes. It is our hope that with these tools—the research methods described in this text—you will be on the path toward answering your own questions in the field of psychology.

SUMMARY

Psychologists seek to understand behavior and mental processes by developing theories and conducting psychological research. Psychological studies can have an important impact on individuals and society; one example is research demonstrating the negative impact of violence in the media. Researchers use the scientific method, which emphasizes an empirical approach to understanding behavior; this approach relies on direct observation and experimentation to answer questions. Scientific practice occurs in historical, social-cultural, and moral contexts. Historically, the computer revolution was instrumental in the shift in emphasis from behaviorism to cognitive psychology. Many psychologists, past and present, have helped to develop the diverse field of psychology.

The social-cultural context influences psychological research in terms of what researchers choose to study and society’s acceptance of their findings. Culture also influences research when ethnocentrism occurs. In this bias people attempt to understand the behavior of individuals who live in a different culture through the framework or views of their own culture. The moral context demands that researchers maintain the highest standards of ethical behavior. Clear violations of scientific integrity include fabrication of data, plagiarism, selective reporting of research findings, failure to acknowledge individuals who made significant contributions to the research, misuse of research funds, and unethical treatment of humans or animals. The APA’s code of ethics guides research and helps researchers to evaluate ethical dilemmas such as the risks and benefits associated with deception and the use of animals in research.

Researchers must be skeptical regarding claims about behavior and mental processes. The strongest evidence for a claim comes from converging evidence across many studies, although scientists recognize that all research findings are probabilistic rather than definitive. Two problems arise with media reports of

research: the research may not meet high standards, and media reports are typically summaries of the original research. An important first step in evaluating media reports is to go to the original publication to learn more about the methods and procedures of the research.

The first step in beginning research is to generate a research question. Students gain research ideas from their textbooks and courses, and through interactions with instructors. The next step is to develop a research hypothesis. A research hypothesis is a tentative explanation for the phenomenon to be tested, and it is often stated in the form of a prediction together with an explanation for the predicted outcome. Although research hypotheses are developed in many ways, an essential part of this step is to review psychological research literature related to the topic. Finally, it is important to evaluate whether answers to a research question will meaningfully contribute to psychologists' understanding of behavior and mental processes.

A multimethod approach employs various research methodologies and measures to answer research questions and to gain a more complete understanding of behavior. Scientists recognize that any one method or measure of behavior is flawed or incomplete; multiple methods allow researchers to “fill in the gaps” left by any particular method. The aim of this textbook is to introduce you to the variety of research methods used by psychologists to answer their questions.

KEY CONCEPTS

scientific method	4	hypothesis	20
empirical approach	7	multimethod approach	23
ethnocentrism	12		

REVIEW QUESTIONS

- 1 Describe two important characteristics of the scientific method.
- 2 Why did early psychologists choose the empirical approach as the favored method for psychological investigations?
- 3 Identify two ways in which the computer was critical to the development of psychology in the 20th century.
- 4 Provide an example of (1) how social and cultural factors may influence psychologists' choice of research topics and (2) how social-cultural factors may influence society's acceptance of research findings.
- 5 Describe how ethnocentrism can be a problem in research and suggest one way in which researchers can prevent this bias.
- 6 What does it mean that research is conducted in a “moral context”?
- 7 Describe two ethical dilemmas that psychologists may face when conducting research.
- 8 Explain why researchers are skeptical about research findings, and explain how their attitude likely differs from that of the general public.
- 9 Identify the type of evidence that researchers look for when they seek to make a strong claim about behavior or psychological processes.
- 10 Identify two reasons you would give another person as to why he or she should critically evaluate the results of the research reported in the news media (e.g., television, magazines).

- 11 What are the three initial steps researchers take as they begin a research project?
- 12 Identify two reasons it is important to search the psychological literature when beginning research.
- 13 Describe the multimethod approach to research and identify its main advantage.

CHALLENGE QUESTIONS

- 1 Consider the hypothesis that playing violent video games causes people to be more aggressive compared to watching passive violence on television.
 - A How might you test this hypothesis? That is, what might you do to compare the two different experiences of exposure to violence?
 - B How would you determine whether people acted in an aggressive manner after exposure to violence?
 - C What additional factors would you have to consider to make sure that *exposure to violence*, not some other factor, was the important factor?
- 2 In your courses you have learned a variety of approaches to gaining knowledge about people. For example, in reading literature, we learn about people through the eyes of the author and the characters he or she has developed. How is this approach to gaining knowledge different from that used by researchers in psychology? What are the advantages and disadvantages of each approach?
- 3 Across the history of research in psychology, we have witnessed a change in emphases from sensation-perception to behaviorism and then to cognitive psychology. Within the different areas or subdisciplines of psychology (e.g., clinical, developmental, neuroscience, social), the number of research topics has increased tremendously.
 - A What area(s) within psychology is of most interest to you, and why?
 - B At your library, page through three or four current issues of journals within your area of interest (e.g., *Developmental Psychology*, *Journal of Consulting and Clinical Psychology*, *Journal of Personality and Social Psychology*). (Ask your instructor or librarian for names of additional journals.) What topics did the researchers investigate? Can you observe any trends in the topics or in the kind of research that is being conducted? Describe your findings.
- 4 Identify how ethnocentrism might play a role in the type of research the following groups choose to pursue by providing a sample research question that would likely be of interest for each group.
 - A men vs. women
 - B ethnic majority vs. ethnic minority
 - C political conservative vs. political liberal
 - D ages 18–25 vs. 35–45 vs. 55–65 vs. 75–85

Answer to Stretching Exercise

1 c 2 a 3 b 4 d

The most convincing research evidence is found in statement 2 because it describes a review of treatment studies involving medication, interpersonal psychotherapy, and cognitive behavior therapy. Converging evidence across studies—in this case, concerning the treatment of depression—allows us to be most confident about the findings. The second-most convincing evidence occurs when a cause-and-effect relationship is identified (we will discuss this more in Chapter 2 and later chapters). The first statement describes a finding that *if (and only if)* participants' behavior is mimicked, *then* they will be more helpful. That is, mimicking causes people to be more helpful. The next level of convincing evidence occurs when a relationship is demonstrated between two variables, as in statement 4. In this statement, the two variables are (a) the extent to which adolescent girls perceive a pressure to be thin and (2) the degree to which they are dissatisfied with their body. Note that describing this relationship doesn't allow one to say that perceiving a pressure to be thin *causes* girls to be dissatisfied. It's also possible, for example, that being dissatisfied with their body causes girls to perceive a pressure to be thin (i.e., just the reverse). Finally, the last, or lowest, level of convincing evidence comprises an observation of an event. In statement 3, an observation is made that traffic fatalities appeared to increase in October–December, 2001. We can't say why fatalities increased, but we can *guess* that the increase may be due to people's reactions to the events of September 11, 2001.

Answer to Challenge Question 1

- A** One way to test this hypothesis would be to have two groups of participants. One group would play violent video games, and a second group would watch violence on television. A second way to test the hypothesis would be to use the same group of participants and expose them to both types of violence at different points in time.
- B** To determine whether people behaved more aggressively following exposure to video games or television, you would need some measure of aggressive behavior. A potentially limitless number of measures exists, perhaps limited only by the ingenuity of the researcher. A good first step is to use measures that other investigators have used; that way, you can compare the results of your study with previous results. Measures of aggression include asking people to indicate how they would respond to hypothetical situations involving anger, or observing how they respond to experimenters (or others) following exposure to violence. In the latter case, the researcher would need a checklist or some other method for recording participants' violent (or nonviolent) behavior. Keep in mind that aggression can be defined in a number of ways, including physical behaviors, verbal behaviors, and even thoughts (but note the difficulty in measuring the latter).
- C** It would be important to make sure that the two groups—television *vs.* video game—are similar in every way *except* for television or video game exposure. For example, suppose your research had two groups of participants: one group watched television and the other group played video games. Suppose, also, that your results indicated that participants who played video games were more aggressive than participants who watched television on your aggression measure.

One problem would occur if the video game participants were naturally more aggressive to begin with compared to the television participants. It would be impossible to know whether exposure to violence in your research or their natural differences in aggressiveness accounted for the observed difference in aggressiveness in your experiment. You would want to make sure, therefore, that the participants in each group are similar before the exposure to violence. Later in this text you will learn how to make the groups similar.

You would also want to make sure that other aspects of the participants' experiences are similar. For example, you would ensure that the length of time exposed to violence in each group is similar. In addition, you would try to make sure that the degree of violence in the television program is similar to the degree of violence in the video game. It would also be important that participants' experiences do not differ for a number of additional factors, such as whether other people are present and the time of day. In order to demonstrate that video game playing causes more (or less) aggression than television viewing, the most important point is that the only factor that should differ between the groups is the type of exposure.