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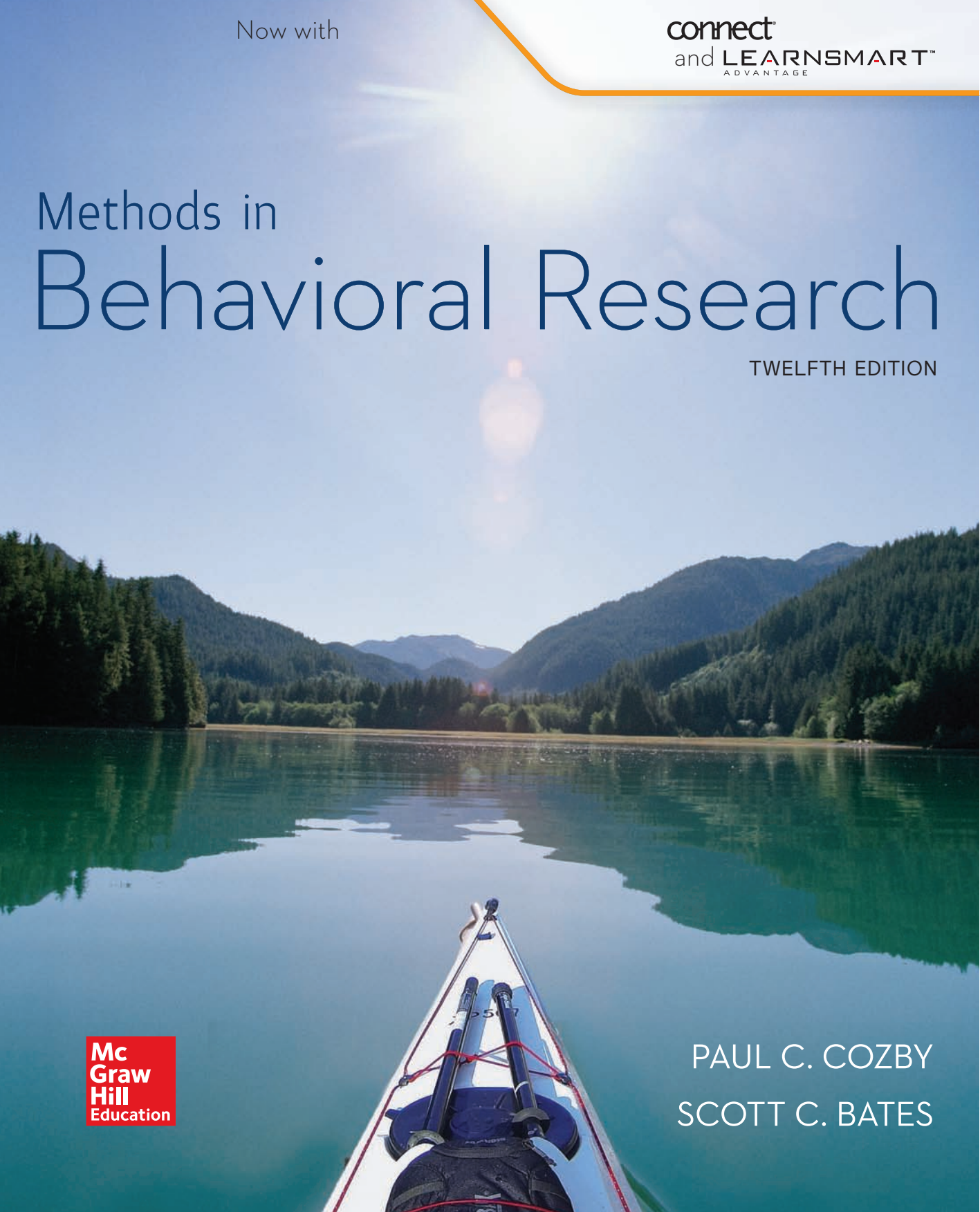
Methods in Behavioral Research

TWELFTH EDITION



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Methods in Behavioral Research

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TWELFTH EDITION

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For Ingrid and Pierre

—PCC

For Mary, my mother, whose aspirations for me were an inspiration to me.

—SCB

Contents

Preface

Now supported by LearnSmart, McGraw-Hill's adaptive and personalized learning program, the helpful pedagogy, rich examples, and clear voice of *Methods in Behavioral Research* guide students toward success by helping them study smarter and more efficiently.

IN OUR NEW TWELFTH EDITION, the primary focus of *Methods in Behavioral Research* remains constant: We continue to believe that teaching and learning about research methods is both challenging and great fun, and so we emphasize clear communication of concepts using interesting examples as our highest priority.

We have added to and updated our examples, clarified concepts throughout, and removed material that was distracting or confusing. We continue to enhance learning by describing important concepts in several contexts throughout the book; research shows that redundancy aids understanding. We also emphasize the need to study behavior using a variety of research approaches. We have had a positive response to the addition of Illustrative Articles in most chapters: Students are asked to find and read a specific recent journal article and answer questions that require use of concepts introduced in the chapter.

VALIDITY

The twelfth edition expands and emphasizes coverage of *validity* in behavioral research. By highlighting the key concepts of *internal, external*, and *construct validity* throughout the text, we hope to support students' understanding of these fundamental ideas. Furthermore, *validity* now provides a theme that runs throughout the text—just as validity is a theme that runs throughout behavioral research.

ORGANIZATION

The organization generally follows the sequence of planning and conducting a research investigation. Chapter 1 gives an overview of the scientific approach to knowledge and distinguishes between basic and applied research. Chapter 2 discusses sources of ideas for research and the importance of library research. Chapter 3 focuses on research ethics; ethical issues are covered in depth here and emphasized throughout the book. Chapter 4 introduces validity and examines psychological variables and the distinction between experimental and nonexperimental approaches to studying relationships among variables. Chapter 5 focuses on measurement issues, including reliability and validity. Nonexperimental research approaches—including naturalistic observation, cases studies,

and content analysis—are described in Chapter 6. Chapter 7 covers sampling as well as the design of questionnaires and interviews. Chapters 8 and 9 present the basics of designing and conducting experiments. Factorial designs are emphasized in Chapter 10. Chapter 11 discusses the designs for special applications: single-case experimental designs, developmental research designs, and quasi-experimental designs. Chapters 12 and 13 focus on the use of statistics to help students understand research results. These chapters include material on effect size and confidence intervals. Finally, Chapter 14 discusses generalization issues, meta-analyses, and the importance of replications.

Appendices on communicating research findings, ethical standards, and conducting statistical analyses are included as well. Appendix A presents a thorough treatment of current APA style plus an example of an actual published paper as illustration. The APA Ethics Code is now included in Appendix B as a resource rather than a section of the chapter on research ethics. Appendix C provides examples of formulas and calculations to help students conduct and present their own research. Statistical significance tables have been deleted; we refer readers to Internet resources when this information is needed.

FLEXIBILITY

Chapters are relatively independent, providing instructors maximum flexibility in assigning the order of chapters. For example, chapters on research ethics and survey research methods are presented early in the book, but instructors who wish to present this material later in a course can easily do so. It is also relatively easy to eliminate sections of material within most chapters.

FEATURES

Clarity. The twelfth edition retains the strength of direct, clear writing. Concepts are described in different contexts to enhance understanding.

Compelling examples. Well-chosen research examples help students interpret challenging concepts and complex research designs.

Illustrative Articles. For most chapters, we selected an article from the professional literature that demonstrates and illustrates the content of the chapter in a meaningful way. Each article provides an interesting, engaging, and student-relevant example as a chapter-closing capstone exercise. In each case, an APA-style reference to a published empirical article is included, along with a brief introduction and summary. Three to five key discussion questions provide an applied, critical thinking–oriented, and summative learning experience for the chapter.

Flexibility. Instructors are able to easily customize the chapter sequence to match their syllabi.

Decision-making emphasis. Distinguishing among a variety of research designs helps students understand when to use one type of design over another.

Strong pedagogy. Learning Objectives open each chapter. Review and activity questions provide practice for students to help them understand the material. Boldface key terms are listed at the end of each chapter, and many are also defined in a Glossary at the end of the book.

PERSONALIZED GRADING, ON THE GO, MADE EASIER

Methods in Behavioral Research is available to instructors and students in traditional print format as well as online within McGraw Hill Connect, an integrated assignment and assessment platform. Connect Behavioral Research Methods' online tools make managing assignments easier for instructors- and make learning and studying more motivating and efficient for students.

The first and only analytics tool of its kind, Connect Insight™ is a series of visual data displays—each framed by an intuitive question—to provide at-a-glance information regarding how your class is doing. Instructors receive instant student performance matched with student activity, view real-time analytics so instructors can take action early and keep struggling students from falling behind, and be empowered with a more valuable and productive connection between themselves and their students with the transparency Connect Insight™ provides in the learning process.

- Make It Intuitive. You receive instant, at-a-glance view of student performance matched with student activity.
- Make It Dynamic. Connect Insight™ puts real-time analytics in your hands so you can take action early and keep struggling students from falling behind.
- Make It Mobile. Connect Insight™ travels from office to classroom, available on demand wherever and whenever it's needed.

Achieve simplicity in assigning and engaging your students with course materials. Craft your teaching resources to match the way you teach! With McGraw-Hill Create, www.mcgrawhillcreate.com, you can easily rearrange chapters, combine material from other content sources, and quickly upload content you have written, such as your course syllabus or teaching notes. Find the content you need in Create by searching through thousands of leading McGraw-Hill textbooks. Arrange your book to fit your teaching style. Create even allows you to

personalize your book's appearance by selecting the cover and adding your name, school, and course information. Order a Create book and you'll receive a complimentary electronic review copy (eComp) via email in about an hour. Experience how McGraw-Hill Create empowers you to teach your students *your* way.

Tegrity is a service that makes class time available all the time by automatically capturing every lecture in a searchable format for students to review when they study and complete assignments. With a simple one click start-and-stop process, users capture all computer screens and corresponding audio. Students can replay any part of any class with easy-to-use browser-based viewing on a PC or a Mac.

Educators know that the more students can see, hear, and experience class resources, the better they learn. Students quickly recall key moments by using Tegrity Campus's unique search feature. This feature helps students efficiently find what they need, when they need it, across an entire semester of class recordings. Help turn all your students' study time into learning moments immediately supported by your lecture.

BETTER DATA, PERSONALIZED STUDY, IMPROVED RESULTS

LEARNSMART® LearnSmart is an adaptive learning program designed to help students learn faster, study smarter, and retain more knowledge for greater success. Distinguishing what students know from what they don't, and focusing on concepts they are most likely to forget, LearnSmart continuously adapts to each student's needs by building an individual learning path. Millions of students have answered over a billion questions in LearnSmart since 2009, making it the most widely used and intelligent adaptive study tool that's proven to strengthen memory recall, keep students in class, and boost grades.

SMARTBOOK™ Students study more effectively with Smartbook. Fueled by LearnSmart, SmartBook is the first and only adaptive reading experience currently available.

- **Make It Effective.** SmartBook™ creates a personalized reading experience by highlighting the most impactful concepts a student needs to learn at that moment in time. This ensures that every minute spent with SmartBook™ is returned to the student as the most value-added minute possible.
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the content a student is most likely to forget and brings it back to improve long-term knowledge retention.

CHANGES TO THE TWELFTH EDITION

The twelfth edition of *Methods in Behavioral Research* includes dozens of new references and statistical updates. The Illustrative Articles have been improved throughout by adding new questions for students to address, and examples have been updated to emphasize contemporary research studies. Here is a list of additional changes as they appear by chapter.

Chapter 1-Scientific Understanding of Behavior

- New questions about the Illustrative Article ask students to consider goal of science targeted in two David Brooks' columns that appeared in the *New York Times.*

Chapter 2-Where to Start

- A new discussion emphasizes the importance of establishing good research questions.
- A new Figure 2.1 demonstrates the relationship between research questions, hypothesis, and predictions.

Chapter 3-Ethics in Behavioral Research

- This chapter has been substantially revised and reorganized with a new structure and additional headings to make it more accessible to students.
- Extended coverage of plagiarism identifies "word-for-word plagiarism" and "paraphrasing plagiarism," providing examples of both and suggestions for avoiding them.
- A new figure demonstrates how to weigh risks and benefits in order to develop responsible research.
- A new Illustrative Article "Replication of Milgram" discusses J. M. Burger's 2009 article from *American Psychologist*.

Chapter 4-Fundamental Research Issues

- The section on external validity has been reorganized to make the material more accessible and to place greater emphasis on experiments.
- A new table, "Gender and Facebook Use," has been added.

Chapter 6-Observational Methods

- A new discussion describes the Electronically Activated Recorder and how that technology was used in a 2009 case to compare social behaviors between Americans and Mexicans.

Chapter 7-Asking People About Themselves: Survey Research

- The discussion of online surveys has been updated to show how this method of administering surveys is specifically being used in academia.

Chapter 8-Experimental Design

- The "Time Interval Between Treatments" section includes a new example from a 2009 study on the effect of marijuana on risk taking.
- A new figure, "Solomon-Group Four Design," has been added.

Chapter 9-Conducting Experiments

- The "Straightforward Manipulations" section includes a new example from a 2013 study that examined the effectiveness of three training programs designed to improve jurors' ability to evaluate eyewitness testimony.
- The "Physiological Measures" section includes a new example from a 2013 study that examined eating behavior while viewing a food-related or nature television program.

Chapter 10-Complex Experimental Designs

- A new example and illustrations of a 2×2 factorial design from a 2009 study that examined modeling of food intake when someone is with another person who is eating are included.

Chapter 11-Single-Case, Quasi-Experimental, and Developmental Research

- The discussion on cross-sectional method includes a new example from a 2013 study that examined subjects in four age groups that completed the same financial decision-making task.

Chapter 14-Generalization

- A new discussion stresses the importance of research conducted with nonhuman animals.
- A new section examines ways to support good external validity.

Appendix A-Reporting Research

- Reorganized to include an APA-style Illustrative Article and illustrated content on creating posters.

Appendix B-Ethical Principles of Psychologists and Code of Conduct

- A new appendix that supports the changes in Chapter 3.

ADDITIONAL RESOURCES

Instructor's Manual: Designed to provide a wide variety of resources for presenting the course, the instructor's manual includes learning objectives, ideas for lectures and discussions, laboratory demonstrations, and activities are aligned specifically to facilitate a clearer knowledge of research methods.

Test Bank: By increasing the rigor of the test bank development process, McGraw-Hill has raised the bar for student assessment. A coordinated team of subject-matter experts methodically vetted each question and set of possible answers for accuracy, clarity, and effectiveness. Each question is further annotated for level of difficulty, Bloom's taxonomy, APA learning outcomes, and corresponding coverage in the text. Structured by chapter, the questions are designed to test students' conceptual, applied, and factual understanding.

Lecture Presentation: PowerPoint slides are provided that present key points of the chapter, along with supporting visuals. All of the slides can be modified to meet individual needs.

Image Gallery: The complete set of figures and tables from the text are available for download and can be easily embedded into PowerPoint slides.

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We are always interested in receiving comments and suggestions from students and instructors. Please email us at scott.bates@usu.edu or cozby@fullerton.edu.

1 Scientific Understanding of Behavior

LEARNING OBJECTIVES

- Describe why an understanding of research methods is important.
- Describe the scientific approach to learning about behavior and contrast it with pseudoscientific research.
- Define and give examples of the four goals of scientific research: description, prediction, determination of cause, and explanation of behavior.
- Discuss the three elements for inferring causation: temporal order, covariation of cause and effect, and elimination of alternative explanations.
- Define, describe, compare, and contrast basic and applied research.

DO SOCIAL MEDIA SITES LIKE FACEBOOK AND INSTAGRAM IMPACT OUR RELATIONSHIPS? What causes alcoholism? How do our early childhood experiences affect our later lives? How do we remember things, what causes us to forget, and how can memory be improved? Why do we procrastinate? Why do some people experience anxiety so extreme that it disrupts their lives while others—facing the same situation—seem to be unaffected? How can we help people who suffer from depression? Why do we like certain people and dislike others?

Curiosity about questions like these is probably the most important reason that many students decide to take courses in the behavioral sciences. Science is the best way to explore and answer these sorts of questions. In this book, we will examine the methods of scientific research in the behavioral sciences. In this introductory chapter, we will focus on ways in which knowledge of research methods can be useful in understanding the world around us. Further, we will review the characteristics of a scientific approach to the study of behavior and the general types of research questions that concern behavioral scientists.

IMPORTANCE OF RESEARCH METHODS

We are continuously bombarded with research results: "Happiness Wards Off Heart Disease," "Recession Causes Increase in Teen Dating Violence," "Breast-Fed Children Found Smarter," "Facebook Users Get Worse Grades in College." Articles and books make claims about the beneficial or harmful effects of particular diets or vitamins on one's sex life, personality, or health. Survey results are frequently reported that draw conclusions about our beliefs concerning a variety of topics. The key question is, how do you evaluate such reports? Do you simply accept the findings because they are supposed to be scientific? A background in research methods will help you read these reports critically, evaluate the methods employed, and decide whether the conclusions are reasonable.

Many occupations require the use of research findings. For example, mental health professionals must make decisions about treatment methods, assignment of clients to different types of facilities, medications, and testing procedures. Such decisions are made on the basis of research; to make good decisions, mental health professionals must be able to read the research literature in the field and apply it to their professional lives. Similarly, people who work in business environments frequently rely on research to make decisions about marketing strategies, ways of improving employee productivity and morale, and methods of selecting and training new employees. Educators must keep up with research on topics such as the effectiveness of different teaching strategies or programs to deal with special student problems. Knowledge of research methods and the ability to evaluate research reports are useful in many fields.

It is also important to recognize that scientific research has become increasingly prominent in public policy decisions. Legislators and political leaders at all levels of government frequently take political positions and propose legislation based on research findings. Research may also influence judicial decisions: A classic example of this is the *Social Science Brief* that was prepared by psychologists and accepted as evidence in the landmark 1954 case of *Brown v. Board of Education* in which the U.S. Supreme Court banned school segregation in the United States. One of the studies cited in the brief was conducted by Clark and Clark (1947), who found that when allowed to choose between light-skinned and dark-skinned dolls, both Black and White children preferred to play with the light-skinned dolls (see Stephan, 1983, for a further discussion of the implications of this study).

Behavioral research on human development has influenced U.S. Supreme Court decisions related to juvenile crime. In 2005, for instance, the Supreme Court decided that juveniles could not face the death penalty (*Roper v. Simmons*), and the decision was informed by neurological and behavioral research showing that the brain, social, and character differences between adults and juveniles make juveniles less culpable than adults for the same crimes. Similarly, in the 2010 Supreme Court decision *Graham v. Florida*, the Supreme Court decided that juvenile offenders could not be sentenced to life in prison without parole for non-homicide offenses. This decision was influenced by research in developmental psychology and neuroscience. The court majority pointed to this research in their conclusion that assessment of blame and standards for sentencing should be different for juveniles and adults because of juveniles' lack of maturity and poorly formed character development (Clay, 2010).

Research is also important when developing and assessing the effectiveness of programs designed to achieve certain goals—for example, to increase retention of students in school, influence people to engage in behaviors that reduce their risk of contracting HIV, or teach employees how to reduce the effects of stress. We need to be able to determine whether these programs are successfully meeting their goals.

Finally, research methods are important because they can provide us with the best answers to questions like those we posed at the outset of the chapter. Research methods can be the way to satisfy our native curiosity about ourselves, our world, and those around us.

WAYS OF KNOWING

We opened this chapter with several questions about human behavior and suggested that scientific research is a valuable means of answering them. How does the scientific approach differ from other ways of learning about behavior? People have always observed the world around them and sought explanations for what they see and experience. However, instead of using a scientific approach, many people rely on ***intuition*** and ***authority*** as primary ways of knowing.

Intuition

Most of us either know or have heard about a married couple who, after years of trying to conceive, adopt a child. Then, within a very short period of time, they find that the woman is pregnant. This observation leads to a common belief that adoption increases the likelihood of pregnancy among couples who are having difficulties conceiving a child. Such a conclusion seems intuitively reasonable, and people usually have an explanation for this effect—for example, the adoption reduces a major source of marital stress, and the stress reduction in turn increases the chances of conception (see Gilovich, 1991).

This example illustrates the use of intuition and anecdotal evidence to draw general conclusions about the world around us. When you rely on intuition, you accept unquestioningly what your own personal judgment or a single story about one person's experience tells you. The intuitive approach takes many forms. Often, it involves finding an explanation for our own behaviors or the behaviors of others. For example, you might develop an explanation for why you keep having conflicts with your roommate, such as "he hates me" or "having to share a bathroom creates conflict." Other times, intuition is used to explain intriguing events that you observe, as in the case of concluding that adoption increases the chances of conception among couples having difficulty conceiving a child.

A problem with intuition is that numerous cognitive and motivational biases affect our perceptions, and so we may draw erroneous conclusions about cause and effect (cf. Fiske & Taylor, 1984; Gilovich, 1991; Nisbett & Ross, 1980; Nisbett & Wilson, 1977). Gilovich points out that there is in fact no relationship between adoption and subsequent pregnancy, according to scientific research investigations. So why do we hold this belief? Most likely it is because of a cognitive bias called *illusory correlation* that occurs when we focus on two events that stand out and occur together. When an adoption is closely followed by a pregnancy, our attention is drawn to the situation, and we are biased to conclude that there must be a causal connection. Such illusory correlations are also likely to occur when we are highly motivated to believe in the causal relationship. Although this is a natural thing for us to do, it is not scientific. A scientific approach requires much more evidence before conclusions can be drawn.

Authority

The philosopher Aristotle said: "Persuasion is achieved by the speaker's personal character when the speech is so spoken as to make us think him credible. We believe good men more fully and readily than others." Aristotle would argue that we are more likely to be persuaded by a speaker who seems prestigious, trustworthy, and respectable than by one who appears to lack such qualities.

Many of us might accept Aristotle's arguments simply because he is considered a prestigious authority—a convincing and influential source—and his

writings remain important. Similarly, many people are all too ready to accept anything they learn from the Internet, news media, books, government officials, celebrities, religious figures, or even a professor! They believe that the statements of such authorities must be true. The problem, of course, is that the statements may not be true. The scientific approach rejects the notion that one can accept *on faith* the statements of any authority; again, more evidence is needed before we can draw scientific conclusions.

Empiricism

The scientific approach to acquiring knowledge recognizes that both intuition and authority can be sources of ideas about behavior. However, scientists do not unquestioningly accept anyone's intuitions—including their own. Scientists recognize that *their* ideas are just as likely to be wrong as anyone else's. Also, scientists do not accept on faith the pronouncements of anyone, regardless of that person's prestige or authority. Thus, scientists are very skeptical about what they see and hear. Scientific **skepticism** means that ideas must be evaluated on the basis of careful logic and results from scientific investigations.

If scientists reject intuition and blind acceptance of authority as ways of knowing about the world, how do they go about gaining knowledge? The fundamental characteristic of the scientific method is **empiricism**—the idea that knowledge is based on observations. Data are collected that form the basis of conclusions about the nature of the world. The scientific method embodies a number of rules for collecting and evaluating data; these rules will be explored throughout the book.

The Scientific Approach

The power of the scientific approach can be seen all around us. Whether you look at biology, chemistry, medicine, physics, anthropology, or psychology, you will see amazing advances over the past 5, 25, 50, or 100 years. We have a greater understanding of the world around us, and the applications of that understanding have kept pace. Goodstein (2000) describes an "evolved theory of science" that defines the characteristics of scientific inquiry. These characteristics are summarized below.

- **Data play a central role** For scientists, knowledge is primarily based on observations. Scientists enthusiastically search for observations that will verify or reject their ideas about the world. They develop theories, argue that existing data support their theories, and conduct research that can increase our confidence that the theories are correct. Observations can be criticized, alternatives can be suggested, and data collection methods can be called into question. But in each of these cases, the role of data is central and fundamental. Scientists have a "show me, don't tell me" attitude.

- **Scientists are not alone** Scientists make observations that are accurately reported to other scientists and the public. You can be sure that many other scientists will follow up on the findings by conducting research that replicates and extends these observations.
- **Science is adversarial** Science is a way of thinking in which ideas do battle with other ideas in order to move ever closer to truth. Research can be conducted to test any idea; supporters of the idea and those who disagree with the idea can report their research findings, and these can be evaluated by others. Some ideas, even some very good ideas, may prove to be wrong if research fails to provide support for them. Good scientific ideas are testable. They can be supported or they can be falsified by data—the latter concept called **falsifiability** (Popper, 2002). If an idea is falsified when it is tested, science is thereby advanced because this result will spur the development of new and better ideas.
- **Scientific evidence is peer reviewed** Before a study is published in a top-quality scientific journal, other scientists who have the expertise to carefully evaluate the research review it. This process is called **peer review.** The role of these reviewers is to recommend whether the research should be published. This review process ensures that research with major flaws will not become part of the scientific literature. In essence, science exists in a free market of ideas in which the best ideas are supported by research and scientists can build upon the research of others to make further advances.

Integrating Intuition, Skepticism, and Authority

The advantage of the scientific approach over other ways of knowing about the world is that it provides an objective set of rules for gathering, evaluating, and reporting information. It is an open system that allows ideas to be refuted or supported by others. This does not mean that intuition and authority are unimportant, however. As noted previously, scientists often rely on intuition and assertions of authorities for ideas for research. Moreover, there is nothing wrong with accepting the assertions of authority as long as we do not accept them as scientific evidence. Often, scientific evidence is not obtainable, as, for example, when a religious figure or text asks us to accept certain beliefs on faith. Some beliefs cannot be tested and thus are beyond the realm of science. In science, however, ideas must be evaluated on the basis of available evidence that can be used to support or refute the ideas.

There is also nothing wrong with having opinions or beliefs as long as they are presented simply as opinions or beliefs. However, we should always ask whether the opinion can be tested scientifically or whether scientific evidence exists that relates to the opinion. For example, opinions on whether exposure to violent movies, TV, and video games increases aggression are only opinions until scientific evidence on the issue is gathered.

As you learn more about scientific methods, you will become increasingly skeptical of the research results reported in the media and the assertions of scientists as well. You should be aware that scientists often become authorities when they express their ideas. When someone claims to be a scientist, should we be more willing to accept what he or she has to say? First, ask about the credentials of the individual. It is usually wise to pay more attention to someone with an established reputation in the field and attend to the reputation of the institution represented by the person. It is also worthwhile to examine the researcher's funding source; you might be a bit suspicious when research funded by a drug company supports the effectiveness of a drug manufactured by that company, for example. Similarly, when an organization with a particular social-political agenda funds the research that supports that agenda, you should be skeptical of the findings and closely examine the methods of the study.

You should also be skeptical of pseudoscientific research. **Pseudoscience** is "fake" science in which seemingly scientific terms and demonstrations are used to substantiate claims that have no basis in scientific research. The claim may be that a product or procedure will enhance your memory, relieve depression, or treat autism or post traumatic stress disorder. The fact that these are all worthy outcomes makes us very susceptible to believing pseudoscientific claims and forgetting to ask whether there is a valid scientific basis for the claims.

A good example comes from a procedure called *facilitated communication* that has been used by therapists working with children with autism. These children lack verbal skills for communication; to help them communicate, a facilitator holds the child's hand while the child presses keys to type messages on a keyboard. This technique produces impressive results, as the children are now able to express themselves. Of course, well-designed studies revealed that the facilitators, not the children, controlled the typing. The problem with all pseudoscience is that hopes are raised and promises will not be realized. Often the techniques can be dangerous as well. In the case of facilitated communication, a number of facilitators typed messages accusing a parent of physically or sexually abusing the child. Some parents were actually convicted of child abuse. In these legal cases, the scientific research on facilitated communication was used to help the defendant parent. Cases such as this have led to a movement to promote the exclusive use of evidence-based therapies—therapeutic interventions grounded in scientific research findings that demonstrate their effectiveness (cf. Lilienfeld, Lynn, & Lohr, 2004).

So how can you tell if a claim is pseudoscientific? It is not easy; in fact, a philosopher of science noted that "the boundaries separating science, nonscience, and pseudoscience are much fuzzier and more permeable than . . . most scientists . . . would have us believe" (Pigliucci, 2010). Here are a few things to look for when evaluating claims:

- Untestable claims that cannot be refuted.
- Claims rely on imprecise, biased, or vague language.

- Evidence is based on anecdotes and testimonials rather than scientific data.
- Evidence is from experts with only vague qualifications who provide support for the claim without sound scientific evidence.
- Only confirmatory evidence is presented; conflicting evidence is ignored.
- References to scientific evidence lack information on the methods that would allow independent verification.

Finally, we are all increasingly susceptible to false reports of scientific findings circulated via the Internet. Many of these claim to be associated with a reputable scientist or scientific organization, and then they take on a life of their own. A recent widely covered report, supposedly from the World Health Organization, claimed that the gene for blond hair was being selected out of the human gene pool. Blond hair would be a disappearing trait! General rules to follow are (1) be highly skeptical of scientific assertions that are supported by only vague or improbable evidence and (2) take the time to do an Internet search for supportive evidence. You can check many of the claims that are on the Internet on www.snopes.com and www.truthorfiction.com.

GOALS OF BEHAVIORAL SCIENCE

Scientific research on behavior has four general goals: (1) to describe behavior, (2) to predict behavior, (3) to determine the causes of behavior, and (4) to understand or explain behavior.

Description of Behavior

The scientist begins with careful observation, because the first goal of science is to describe behavior—which can be something directly observable (such as running speed, eye gaze, or loudness of laughter) or something less observable (such as self-reports of perceptions of attractiveness). Researchers at the Kaiser Family Foundation (Rideout, Foehr, & Roberts, 2010) described media use (e.g., television, cell phones, movies) of over 2,000 8- to 18-year-olds using a written questionnaire. One section of the questionnaire asked about computer use. Figure 1.1 shows the percentage of time spent on various recreational computer activities in a typical day. As you can see, social networking and game playing are the most common activities. The study is being done every few years so you can check for changes when the next phase of the study is completed.

Researchers are often interested in describing the ways in which events are systematically related to one another. If parents enforce rules on amount of recreational computer use, do their children perform better in school? Do jurors judge attractive defendants more leniently than unattractive defendants?

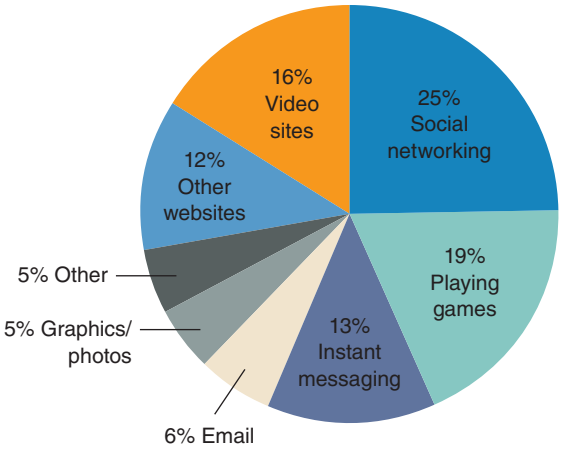

FIGURE 1.1
Time spent on recreational computer activities
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Are people more likely to be persuaded by a speaker who has high credibility? In what ways do cognitive abilities change as people grow older? Do students who study with a television set on score lower on exams than students who study in a quiet environment? Do taller people make more money than shorter people? Do men find women wearing red clothing more attractive than women wearing a dark blue color?

Prediction of Behavior

Another goal of science is to predict behavior. Once it has been observed with some regularity that two events are systematically related to one another (e.g., greater attractiveness is associated with more lenient sentencing), it becomes possible to make predictions. One implication of this process is that it allows us to anticipate events. If you read about an upcoming trial of a very attractive defendant, you can predict that the person will likely receive a lenient sentence. Further, the ability to predict often helps us make better decisions. For example, if you study the behavioral science research literature on attraction and relationships, you will learn about factors that predict long-term relationship satisfaction. You may be able to then use that information when predicting the likely success of your own relationships. You can even take a test that was designed to measure these predictors of relationship success. Tests such as RELATE, FOCCUS, and PREPARE can be completed online by yourself, with a partner, or with the help of a professional counselor (Larson, Newell, Topham, & Nichols, 2002).

Determining the Causes of Behavior

A third goal of science is to determine the *causes* of behavior. Although we might accurately predict the occurrence of a behavior, we might not correctly