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Social Research Methods:
Qualitative and
Quantitative Approaches
W. Lawrence Neuman
Pearson

Social Research Methods

Qualitative and Quantitative Approaches

EIGHTH EDITION

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Pearson

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Preface

With the current edition, this text enters its third decade of publication. As I updated and made minor changes with each edition, I strived to make this a comprehensive, authoritative introduction to social science research that students will find accessible, interesting, and informative.

This book is about both research methodology and research methods. Methods include the techniques of research design, measurement, data collection, and data analysis. A student can master specific research techniques yet still lack an understanding of the bigger issues involved in conducting social research. Compared with research methods, methodology includes the core principles that underlie the conduct of quality research and emphasizes acquiring the foundational knowledge necessary for making sound judgments when applying research techniques.

Four topics within methodology enhance student understanding of the larger social research processes. First, social research is a part of the larger enterprise of scientific knowledge production pursued by the scientific community. Second, social research is conducted and reported on in a "real world" context filled with ethical dilemmas and social-political controversies. Third, assumptions about the nature of social reality and knowledge creation are necessary when conducting research. Research gains strength and clarity when such assumptions are recognized and acknowledged. Fourth, every study requires a balance among available resources (i.e., time, money, and skills), research principles, ethical ideals, and technical standards in a specific setting. Learning about methodology moves students beyond learning to become a capable research technician who can apply the proper procedures, and helps them develop into responsible, reflective social scientists with insight and judgment.

This text has been distinctive in several ways. First, I fully embrace both qualitative and quantitative approaches to social research. Both are valuable ways to conduct social scientific studies that advance knowledge and understanding. Second, I include a discussion of the epistemological concerns and assumptions that underlie several approaches to social research. I believe that being aware of the assumptions helps us recognize how each approach builds significant knowledge, reveals why each approach operates as it does, and shows how the approaches complement one another. Third, I provide numerous examples from the recent research literature to illustrate methodological concepts and techniques. I do this because research principles and techniques only "come alive" in concrete studies, and students best learn when they can see research principles and techniques applied in a concrete study. Fourth, I emphasize how conducting responsible research demands both an ethical awareness and a sensitivity to the larger social-political context. Lastly, the statistics and quantitative data analysis chapter is basic and more conceptual than computational, providing only a foundation. This is because I believe everyone needs a basic foundation, but if a person intends to conduct quantitative social research, he/she should continue on to statistics coursework beyond the level of this text.

This edition continues my commitment to show students that social research is a creative, exciting process. Real people conduct research in the "real world" to advance our collective understanding of the social world. Social research is an active process of discovery and knowledge creation that most students can master with modest effort and diligent study. Most professional researchers are dedicated and committed, yet they are fallible humans living in the "real" social, political, and historical world. It is a world that sometimes inhibits, rejects, or ignores the insights and knowledge that have been meticulously produced by the research process.

New to This Edition

In addition to updating examples and incorporating advances in research techniques and methodological debates, I made many small changes to this edition to enhance the clarity of presentation and increase student engagement. For example, in Chapter 3 on theory and research, I added a discussion of Charles S. Peirce's method of abduction to the explanation of how researchers use induction and deduction to build and test theory. I also added a discussion of "causal mechanisms" and included the idea of process-tracing. In Chapter 4, the discussions of abduction and causal mechanisms are reinforced and integrated into explanations of the alternative approaches to doing social research.

The example studies that open most chapters have been updated in this edition. For example, Chapter 9 on experimental research opens with a study that tests whether having a banker's mind-set encourages a person to be less honest than other people. The hypothesis was generated to understand actions that contributed to the 2008 global financial crisis. Chapter 10 on survey research opens with a study that noted that Americans are often untruthful when they answer survey questions about whether they would support a woman for U.S. president. The study

detects hidden anti-female bias among respondents when they answer survey questions. Chapter 11 on nonreactive research opens with a study on the content of sexist Internet jokes. After locating 200,000 Internet joke sites that contained sexist humor, researchers selected and content analyzed 30 sites to identify joke themes. Chapter 13 opens with two book-length field research studies that appeared shortly before Donald Trump ascended to the nomination for the U.S. presidency. Many observers used the studies to explain his unanticipated support nationwide. The opening study in Chapter 14 on historical-comparative research examines the international and domestic forces that account for how and when the United States, Canada, and Australia adopted same-sex marriage policies.

Besides updating chapter opening studies, I also updated most of the example studies presented to make abstract methodological ideas more concrete and relevant. For example, an updated study in Chapter 7 on measurement discusses the Guttman Scale. The study examined whites' preferences for living in a racially mixed neighborhood with African Americans. It demonstrated that the preferences of whites depended on the specific mix of African Americans and whites in a neighborhood and formed a "Guttman scalable" pattern. Chapter 9 was updated with six recently published experimental studies. At the end of the chapter, a chart identifies the key parts of experiment design that each example study used. In Chapter 13 on field research, the controversial study by Alice Goffman on black inner-city Philadelphia youth is used to describe gatekeeper and access issues in field research. Focus group research was used in another updated example study in Chapter 13 that explored the reasons for unusually high teen suicide rates in a community.

New to this edition are "reflection" boxes that ask students to pause and consider specific issues, dilemmas, or controversies in social research. Examples of the refection boxes include two in Chapter 2. One asks students to reflect on what a program assessment study is assessing and why as well as how the dissemination and application of study results are sometimes distorted by personal, bureaucratic, or political pressures. Another asks students to consider dilemmas that are created by the competing demands in a needs assessment study. One reflection box in Chapter 3 asks students to examine the multiple meanings of social theory, while another has them reflect on how a social theory differs from an ideology. In Chapter 5, one reflection box asks students to consider the privacy implications of conducting social research using "big data." Another asks them to consider the common forms of misuse that occur in evaluation research studies. In Chapter 9, students are asked to reflect on the practice of generalizing the results from laboratory experiments to all humanity when nearly all experiments rely on college undergraduates or research participants drawn from Western, well-educated, industrialized, rich, and democratic societies. The participants' worldviews and life experiences diverge significantly from those found among the vast majority of humanity who reside in non-Western societies that are not rich.

As a final note, the text speaks to a global audience. As social researchers, we need to be aware of how cultural assumptions, beliefs, and values influence research activity and work to build bridges of understanding across social-political boundaries. Social research never occurs in idealized, pure space insulated from actual human concerns. It is always conducted in specific historical times, cultural settings, geographic places, and social-political contexts. All scientists must be sensitive to how ethnocentric and anti-scientific pressures in a society can threaten the potential of research and may prevent it from advancing understanding and providing opportunities to improve the human condition.

Instructor's Resources

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The following array of supplementary materials is available to help busy instructors teach more effectively and to allow busy students to learn more efficiently.

- *PowerPoint*. Provides a core template of the content covered throughout the text in an accessible format. Features include, but not limited to:
  - Keyboard and Screen Reader access
  - Alternative text for images
  - High color contrast between background and foreground colors
- *Instructor's Manual and Test Bank*. Includes chapter outline, additional exercises, supplemental source material, vocabulary terms, multiple-choice questions, and essay questions.
- *MyTest*. An electronic format of the Test Bank to customize in-class tests or quizzes.

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Chapter 1
Why Do Research?

The sociologist, then, is someone concerned with understanding society in a disciplined way. The nature of this discipline is scientific. This means that what the sociologist finds and says about the social phenomena he studies occurs within a certain rather strictly defined frame of reference.

—Peter Berger, *An Invitation to Sociology*, p. 16

Learning Objectives

1.1 Explain how alternatives to social research are used for making decisions.

1.2 Describe the scientific approach to social research.

1.3 Differentiate between quantitative and qualitative approaches to social research.

1.4 Describe the steps in quantitative and qualitative research processes.

1.5 Summarize the applications of social research.

I wrote this book so you can learn how social scientists do research and be prepared to conduct your own studies. In this chapter, you will learn what social science research is about and why you would want to learn how to conduct research studies. In subsequent chapters, you will read about alternative approaches to social research and the principles and techniques used to conduct a study.

Social science research is pervasive. It affects your daily life as well as that of your family, friends, neighbors, and co-workers. Study findings appear on broadcast news programs, in magazines and newspapers, and on websites and blogs. They touch on dozens of topics and fields: law and public safety, schooling, health care, personal and family relations, political issues, and business activities as well as international and social trends.

Social research is not limited to college classrooms, professors, and policy experts. Directly or indirectly it influences relationships with family, friends, and co-workers, participation in community life, and decisions by business, legal, social service, and health care professionals. High school educators, parents, business owners and managers, local public administrators, law enforcement officials, counselors and social workers, physicians, legislators, and others rely on its findings and principles. They apply social science findings to raise children, reduce crime, manage health concerns, sell products or services, digest news events, and so forth. Despite scattered criticism to the contrary, research is highly relevant for understanding social life and for making everyday decisions.

The sheer volume of social research is intimidating. Thousands of studies appear each year on hundreds of different topics. Some studies may be highly relevant to your daily decision-making, such does a college major matter for future employment, or should you try an online dating service to locate a soul mate. Others inform us about the "big issues" such as the rise and fall of cities, the conditions when people of very different cultural backgrounds get along with one another, or the direction of society. More significant than any specific study is overall process of research and how research encourages a distinctive way of seeing and thinking about issues.

Although social science research yields valuable information and expands understanding, it is not 100 percent foolproof. It cannot guarantee perfect results every time or offer "absolute truth." This is why some people distrust research-based knowledge or even ridicule professional researchers and their study results. Despite some derision, in a head-to-head comparison with the alternative ways to learn about the world and make decisions, research readily wins hands down. This is why

professionals, educated people, and responsible leaders consistently turn to the methods, principles, and findings of social research when they want to learn more or make important decisions.

This book examines both the methodology and methods of social science research. The terms appear to be synonyms, but methodology is broader and envelops methods. *Methodology* means understanding the entire research process—including its social-organizational context, philosophical assumptions, ethical principles, and the sociopolitical impact of new research knowledge. *Methods* are the specific techniques used in a study to select cases, measure and observe social life, gather and refine data, analyze data, and report on results. The two are closely linked and interdependent.

Reading and doing social research can be an exciting process of discovery. Conducting research requires persistence, personal integrity, tolerance for ambiguity, interaction with others, and pride in doing high-quality work. It demands logical thinking, carefully following rules, and repeating steps over and again. In the research process, you join theories or ideas with facts in a systematic way and use creativity. To conduct a study, you must plan, select research techniques appropriate to a specific question, and treat the study participants in an ethical way. You must also communicate to others how you conducted the study and what you learned from it.

Next, I present some alternatives to social science research and explain why research is preferred. Later, we will look how the enterprise of scientific research works, including the steps in doing a research study and different types of studies.

Alternatives to Social Science Research

1.1 Explain how alternatives to social research are used for making decisions.

The following are four commonly used alternatives to social science research that many people rely on to make decisions:

1. Personal experience and common sense
2. Experts and authorities
3. Social and mass media
4. Ideological and religious beliefs

Knowledge from Personal Experience and Common Sense

If something happens to you, if you personally see it or experience it, you probably accept it as being true. Personal experience, or "seeing is believing," is a powerful type of knowledge. Unfortunately, it can also lead you astray. Something similar to an optical illusion or mirage can occur. What appears to be true is due to an illusion. The power of immediacy and direct personal contact is so strong that it is easy to fall for illusions without realizing it. Most of us believe we are capable of explaining the world we live in, but careful tests show that most of us make many errors and are overconfident. Moreover, the errors of personal experience reinforce each other. This is why many of us believe our experiences rather than what we learn from a carefully conducted research studies. A few people even purposely use the distortions in personal experience to mislead others through cons or fraud, magic tricks, political manipulation, and advertising gimmicks.

Research has discovered many of the ways we misjudge, over- or underestimate, and make mistakes. Here is an example: Women tend to stick with skin creams that do not work. Moreover, the less effective a beauty product or treatment, the more likely they will keep using it. These are the findings of a study of 300 women, ages 27 to 65, who were trying to achieve a more youthful appearance by using creams, vitamins, and other beauty treatments. The findings were not what we might expect: The women were most loyal to products and treatments when they didn't work! Among women who felt that the treatments were not working, 27 percent stopped using them. Among women who felt the treatments were successful, 55 percent stopped using them. The researchers think the women keep doing something that did not work because when people do not feel good about themselves, fear is a more powerful motivator than success. Fear about looking older spurred the women to keep trying even when products don't work.[1]

While studies that uncover people's tendency to misjudge are fun to read, they point to a general principle: Everyday reasoning and perceptions are imperfect and subject to error. More significantly, it is easy for us to overlook or miss such errors.

Knowledge from personal experience, commonsense "facts," and reasoning might be correct, but they can lead us astray (see Reflection Box 1.1, Ignorance, Misperception, and Fake News). For example, common sense says that distributing free condoms in high schools will encourage teens to engage in sexual activity or that imposing harsh punishment, such as the death penalty, decreases violent crimes—yet, numerous studies suggest that both of these beliefs are false. Most people think an eyewitness account of a crime is ideal, but studies show they are highly inaccurate. Many people believe the rich are more generous and honest than the poor, but the opposite is true—the rich give less, as a percentage of their income, to charity and are less honest than lower income people. Many of us worry about tragic accidents and horrific events, such as a plane crash or a school shooting. Yet, we tend to worry about the "wrong" things because our estimates of something happening are usually far

Reflection Box 1.1 Ignorance, Misperception, and Fake News

The commonsense reasoning we use every day is filled with logical fallacies or errors. Scientific research is designed to avoid commonsense errors that mislead and misinform us. Being ignorant, or uninformed, is different from being misinformed. When we are uninformed, we do not know the correct answer to a question (e.g., has the violent crime rate in the United States increased or decreased over the past decade?) It is simple to correct: provide accurate information (e.g., review published statistical studies and data of the Department of Justice).

Being misinformed is a more serious error than being uninformed. We are misinformed when we believe that we know something but are mistaken (e.g., when President Donald Trump repeatedly declared that the U.S. crime rate had been increasing when in reality it had been declining). Also, we may lack an awareness that we are mistaken. Being misinformed is often accompanied by a refusal to change our position, even when we are presented with accurate information and may become misperception.

Misperception is when we hold a false belief that contradicts the "best available evidence" available in the public domain (Flynn et al., 2017:128). That people stubbornly cling to false beliefs and reject accurate, well-researched evidence is an intriguing form of misinformation. Especially since research has documented that large parts of the population carry misperceptions on a range of issues or policies.

The publicized term "fake news" contributes to public misperceptions. Fake news has several origins.

- It can be an outright lie intentionally created to mislead people.
- It can be highly selective, extremely biased information presented to persuade others, or presented without an awareness of its extreme bias because the source is so intensely committed to a single viewpoint.
- It can be false information that originated as a rumor, a seriously distorted misreading of actual evidence, or invented wholly in a person's imagination.
- It can be false and misleading information announced by a prominent public figure or organization that is widely disseminated without comment.

A lie or false information becomes "fake news" when a recognized news outlet (e.g., a print or web newspaper or magazine, television or radio news broadcast, official press release) presents it as being accurate and truthful (i.e., not an opinion, a joke, or fantasy) or the falsehood circulates as accurate and truthful news in other formats (e.g., a text, blog, tweet, or in social media). One study found that 75 percent of adult Americans accepted "fake news" stories as being real, with acceptance greatest among people who relied on Facebook™ for news (Silverman and Singer-Vine, 2016). A separate study found that 82 percent of middle school students could not distinguish paid advisements from actual news stories (Wineburg et al., 2016).

Large sections of the American public hold misperceptions about many issues (e.g., the safety of food or of medications, actions of political leaders, what a law states or policy does, what scientists agree upon, whether historical events really happened). Such misperceptions are often reinforced by the process of "motivated reasoning" (Kundra and Sinclair, 1999). Motivated reasoning occurs when a person selectively seeks or selectively remembers information that confirms his/her prior beliefs, and at the same time, rejects contradictory information. Often such selective seeking/remembering joins with a person's belief that he or she is well informed and knowledgeable on the issue.

Increased misperception in the United States has been blamed on growing political polarization, declining trust in major institutions (e.g., media, government, education), threatened social identities, shifting journalistic standards, a proliferation of news sources, and a greater reliance on social media for news. Misperception is due less to individual flaws or lack of schooling than to how major institutions operate, broad cultural trends, and the habitual ways that humans think and see the world (i.e., commonsense reasoning).

Many misperceptions follow from commonsense reasoning, the "default mode of thinking" (Sinatra et al., 2014:125) and may be difficult to overcome. Misperceptions can have real consequences. Although false, they influence people's voting choices, the purchases people make, whether people take or give their children medications, where people travel or decide to live, which laws become enacted, and who people view as being their friends or enemies.

Social science research cannot quickly or easily eliminate ignorance, misinformation, and misperception. However, misperception is a belief that contradicts by the "best available evidence" and often includes a rejection of solid evidence when it is presented. The goals of social research are to create the "best available evidence" and to use "critical thinking" that encourages the open-minded acceptance of ideas that have been supported by well-researched evidence.[3]

from actual probabilities based on careful studies. Likewise, surface appearances can mislead. For example, many people purchased a large, powerful-looking SUV for its safety at a time when crash tests and accident records showed SUVs to be less safe than many meeker looking cars.[2]

The six commonsense errors often found in everyday decisions that are greatly reduced, if not eliminated, by the processes of scientific research are as follows:

1. Overgeneralization
2. Selective observation and confirmation bias
3. Premature closure
4. Halo effect
5. False consensus
6. Illusion of explanatory depth

1. Overgeneralization occurs when we have limited evidence, but assume that it applies to a great many other situations as well. Note the word "over." Generalization can be appropriate. We can generalize a small amount of evidence to other situations if done with caution and carefully. Unfortunately, we often generalize far beyond what is acceptable with limited evidence. We often generalize from what we know to unknown areas. For example, over the years, I have personally known five people who are blind. All of them were very outgoing and friendly. Can I conclude that all people who are blind are friendly? Do the five people with whom I had personal experience fully represent all people on the planet who are blind?

2. Selective observation is slightly different from overgeneralization. It occurs when we take special notice of certain people or events and then generalize from them; at the same time, we do not examine the entire range of cases. We tend to focus on particular cases or situations that confirm what we already believe (the confirmation bias). Too often, we dismiss contradictory information as being an exception we can ignore. For example, I believe red-haired people are highly emotional. My belief comes from stereotypes learned from my parents and media sources. I observe many red-haired people and, without being aware, pay great attention to their excited behavior, sadness, anger, excessive laughing, and so on. Without realizing it, I am noticing people and situations that reinforce my preconceived way of thinking.

Studies documented a tendency to "seek out" and distort memories to make them more consistent with what we already think. Selective observation reinforces the confirmation bias. What makes the process especially powerful is that we are rarely aware of it occurring.

3. Premature closure operates with and reinforces the first two errors. It is when we believe that we no longer need to listen, seek information, or raise questions because we already have an answer. For practical purposes, we need to stop gathering information and come to a decision at some point. Unfortunately, most of us tend to be a little lazy or a little sloppy. We gather a small amount of evidence or consider events for a short time and then think we have it all figured out. We stop after we get a small amount of evidence and jump to conclusions.

4. The **halo effect** occurs when we overgeneralize trust in a highly prestigious source. We give a halo, or a positive reputation, to sources or people we respect. The halo "rubs off" onto ideas or people about which we know little. Thus, I pick up a report by a person from a prestigious university, say, Harvard or Cambridge University. Due to the halo of the university, I automatically assume that the author is outstanding, and I expect the report to be excellent. I do not make the same assumption about a report by someone from Unknown University. Because I formed an opinion in advance, I failed to approach each report on its own merits alone. I use my positive feelings as a substitute for doing the work of finding out for myself or as a shortcut when making decisions.

5. False consensus is a well-documented psychological effect.[4] It suggests that we are not good at distinguishing between what we personally believe and what we think other people believe. In short, we tend to overestimate how similar the views of others are to our own views. For example, people often overestimate that their favorite candidate will win an election. This is not a matter of purposely conforming to a crowd perspective. Rather, we tend to feel that our own views are "normal" or "ordinary" in comparison with others. While this might be true, we inaccurately overestimate how much others agree with our views. In terms of social events and issues, few of us are good judges of the thoughts of people around us.

6. Illusion of explanatory depth. Researchers (see Alter et al., 2010; Sloman and Fernbach, 2017) identified another interesting flaw in commonsense thinking. Most of us believe that we know much more than we actually do. In short, we are not nearly as smart or well-informed as we think we are. This powerful (mis)perception can distort our ability to evaluate information in a neutral, unbiased manner. This flaw of overconfidence occurs in many areas, such as explaining how objects we use daily operate (e.g., flush toilet or speedometer), how natural phenomena work (e.g., our lungs or thunderstorms), as well as our comprehension such that we believe we can explain clearly and fully what we just read.

Leonid Rozenblit and Frank Keil (2002) conducted one of several studies to illustrate this error. First, the researchers had 16 graduate students from several Yale University departments rate their understanding (1 to 7) for 48 items (e.g., how a can opener works, how a car battery stores electricity, how a zipper works, how a cell phone works, how the liver removes toxins from blood, how the heart pumps blood, and so forth). Each participant next wrote a detailed, step-by-step causal explanation of four items. They also answered a "diagnostic" question about each

item that required critical knowledge about its mechanism. Next, each read a brief expert description of the phenomenon. Finally, each rerated their previous level of understanding relative to the description. Nearly all showed large decline in their rated understanding for all items. After providing a real explanation, answering a diagnostic question, and compared their understanding to an expert description, most participants reported genuine surprise over their lack of real understanding.

In addition, we readily discount the role of our emotions and value-based beliefs. Most often, emotions are far more significant than "cool reason" in shaping our thinking or ability to follow an argument/explanation. We are largely blind to the powerful influence of our emotions and moral beliefs, and we overestimate our ability to use logical reasoning (see Haidt, 2012).

Knowledge from Experts and Authorities

Most of what we know originates with our parents, teachers, and experts and knowledge we absorbed from books, film, television, the Internet, and other media. Often we accept something as being true because someone with expertise or in a position of authority says it is so, or because it appears in an authoritative, trusted source. Using authority as a basis of knowledge or relying on the wisdom of experts and authorities offers us a quick, simple, and inexpensive way to learn something. An expert may spend a great amount of time to learn something, and we can benefit from that person's experience and efforts.

Relying on experts has limitations, and it is easy to overestimate someone's expertise. Authorities may speak on fields they know little about; they can be plain wrong. Using the halo effect, an expert on one area may illegitimately act as an authority in a different area. This happens with television commercials in which a movie star or football hero tries to convince you to buy a product.

Who decides who is or is not a genuine expert or authority? A person might become a "senior fellow" or "adjunct scholar" in a private "think tank" with an impressive name, such as the Center for the Investigation of X. Some think tanks are legitimate research centers, but many are well-funded fronts by special-interest groups that engage in advocacy politics. No regulations control the titles of think tanks, and anyone can become a "scholar" of them. Think tanks make authoritative statements to the mass media, giving the impression of being neutral and knowledgeable. However, the people working for think tanks may lack real expertise and make statements based on opinion or ideology, not on legitimate research.[5] Later in this chapter, you will read about how the scientific community operates and how it determines who is a genuine expert.

Legitimate experts in a specific field may disagree. Perhaps you have heard the dozens of contradictory and confusing research-based recommendations about health and diet. You might ask, what is so great about research if there is so much disagreement? One reason for this situation is because much of what fills the mass media using the words "research" or "scientific" does not involve actual scientific research. For example, when carefully evaluated very few of the many widely advertised sports equipment, energy supplements, or performance enhancers work as promised—this includes the many claiming to have research support. The same is true for various online dating sites that claim to have a "scientific" basis.[6]

Unfortunately, the media use the term "research" when technically no real research actually backs a statement. Adding to the confusion, scientists do not agree 100 percent of the time. In many areas—the best diet, health practice, public policy, or climate change—there is some disagreement. Later in this chapter, you will read about the operation of the scientific community and see how disagreement arises and is resolved as part of the overall scientific research process.

It is important to learn how to think independently and evaluate research on your own. Always relying on experts and authorities for answers is inconsistent with the principles of a free, democratic society. Some so-called experts promote ideas that only strengthen their own power and position. We lose the ability to decide for ourselves if we depend too much on the authorities. This is a reason to learn about research and acquire the skills—to think clearly and to distinguish strong from weak evidence.

Knowledge Based on Popular and Media Messages

Beyond relying on common sense, personal experience, and experts, we also try to extend our knowledge by talking to others and picking up what we can from the media. Most of the time this is a good idea, but it has serious limitations. Talking to others may be helpful, but studies have found that most people are weak with regard to scientific literacy, geographic knowledge, and clear, logical thinking. This is true even in a rich, advanced, and educated country like the United States in the twenty-first century. (See Reflection Box 1.2 and Scientific Literacy later in this chapter.) Our ability to use advanced technology (an iPhone, GPS devices, or car with advanced equipment) does not mean we always think in a rational, scientific way. A 2006 survey of young men and women ages 18–24 found about half could not locate the states of New York or Ohio on a U.S. map (50% and 43%, respectively) and a majority (63%) could not find Iraq on a map of the Middle East, despite nearly constant news coverage since the U.S. invasion in March 2003. In addition, large proportions of

Reflection Box 1.2 Social Problems and Research

Americans hear a lot about the social problem road rage. *Newsweek* magazine, *Time* magazine, and newspapers in major cities have carried headlines about it. Leading national political officials have held public hearings on it, and the federal government gives millions of dollars in grants to law enforcement and transportation departments to reduce it. A California psychologist now specializes in this disorder and has appeared on several television programs to discuss it.

The term "road rage" first appeared in 1988, and by 1997, the print media were carrying more than 4,000 articles per year on it. Despite media attention about "aggressive driving" and "anger behind the wheel," there is no scientific evidence concerning road rage. The term is not precisely defined. It can refer to anything from gunshots from cars, use of hand gestures, running bicyclists off the road, tailgating, and even anger over auto repair bills! All of the data on crashes and accidents show declines during the same period when road rage reached an epidemic.

Is road rage a serious new social problem or have media reports fueled perceptions of road rage? After hearing or reading about road rage and having a new label for the behavior, people started to notice rude driving behavior and engaged in selective observation. We will not know for sure until it is properly studied, but the amount of such behavior appears not to have changed. It may turn out that the national epidemic of road rage is a widely held myth stimulated by the mass media.

Another traffic-oriented problem occurs each holiday. Several times a year newspapers and television reports are filled with dire warnings about the many traffic accidents that will occur on holidays. They present the Fourth of July weekend holiday in the United States as very deadly with an average of 161 people killed each year. Is holiday tariff an especially serious problem? In reality, the holiday period is no more dangerous than other times, and it may even be a bit safer! How can this be? After a careful comparison with other weekends and accounting for the extra amount of driving, the holiday's accident rate is not different. Safety advocates publicize and distort statistical information in the media to encourage people to drive more safely.

Road rage and holiday havoc are not unique situations; the media exaggerates many issues. "Problem promoters," especially in the broadcast media, highlight dramatic cases or selectively use statistical information to generate attention and agitate the public about a social problem. The mass media reports are not so much wrong as misleading. The media are more effective for public persuasion than for giving a carefully documented and complete picture. If we rely on mass media reports to learn about the social world, major trends, or serious problems, we can easily be misled.[8]

Studies documented poverty, crime, and many other concerns that are shown in film, on television or web video, and in magazines do not accurately represent social reality. The writers who create or "adapt" real life for television shows and movie scripts often distort reality. This may be done intentionally, but more often, they repeat misinformation they have picked up, and their primary goal is to entertain. For example, about only 5 of 400 films that portray psychiatric treatment do so accurately. Likewise, media reports on the size of the Muslim population in the United States are two to three times more than scientifically based estimates suggest. African Americans were 62 percent of all poor people shown in newsmagazine photos and 65 percent on television news, yet in the true racial mix of poor people, only 29 percent are African Americans. What we see on television or visually in photos strongly shapes our views on social issues. Media distortions mean that if we rely on the media for our knowledge of the social world, we will have inaccurate knowledge.[9]

In addition to informing and entertaining us, the media provide a forum in which competing interests try to win over public support. Those for or against a cause mount public relations campaigns and use the media to shape public thinking. As mentioned earlier, advocacy think tanks sometimes have false "experts" to discuss topics in the media. Also, in recent years, the number of video news releases (VNR) has grown dramatically. A VNR is the result of a major company or advocacy group that pays to create sophisticated video that looks just like an independently produced news report. In a VNR, an actor or actress plays an independent reporter. The actor as "reporter" presents what appears to be neutral information or news. In reality, it is a public relations or a promotional statement. Most TV stations show the VNRs without informing viewers about the source. Thus, the television "news report" might actually be a type of sophisticated propaganda designed to influence views on a topic or product. We need exercise caution before accepting the mass media as an authority.[10]

Many earnest science journalists try to deliver accurate research-based information. However, they can be overshadowed by the volume and prominence of other media messages. As you will see later in this chapter, the mass media are not good sources to learn about research. Instead, it is best to rely on the scientific community's communication system that is available at no cost to anyone with some knowledge of research and who devotes the time to explore it.

Table 1.1 Alternative Explanations to Social Research

EXAMPLE ISSUE: WOMEN ARE MORE LIKELY THAN MEN TO DO LAUNDRY
Personal experience and common sense: In my experience, men just are not as concerned about clothing or appearance as much as women are, so it makes sense that women do the laundry. When my friends and I were growing up, my mother and their mothers did the laundry, and female friends did it for their boyfriends but never did the men do it for their girlfriends.
Experts and authority: Experts say that as children, females are taught to make, select, mend, and clean clothing as part of a female focus on physical appearance and on caring for children or others in a family. Women do the laundry based on their childhood preparation.
Popular and media messages: Movies and television commercials show women often doing laundry and enjoying it, but men hate it and mess it up. So, women must be doing laundry because they enjoy it and are skilled at it. It is what we see everywhere and what everyone says.
Ideological beliefs: The proper, natural place division of labor is for women to take charge of the home, caring for children, and overseeing household duties, including cooking, cleaning, and doing the laundry.

the U.S. population believe in phenomena that science rejects, such as UFOs (34%), horoscopes and astrology (31%), ghosts and goblins (51%), witches (34%), or a devil (61%).[7]

Average levels of formal schooling have risen, but many people rely on inaccurate information or cling to nonlogical thinking. Many people go through schooling but learned little or do not continue to apply the knowledge, skills, or thinking acquired in their school years later in their daily life or in job decisions. Also, many people "follow the herd," or rely on mass opinion. The mass media frequently echoes mass opinion without serious evaluation. As you know well, just because most people believe something is true does not make it true. However, many of us just follow "what most other people think" even though it might be wrong.

Knowledge Subordinated to Ideological Beliefs and Values

Despite the strength and availability of social science research, some leaders and decision makers consciously reject it. They instead promote and defend actions based on their political, religious, or ideological beliefs. In the United States, knowledgeable scientists serving in government agencies have been replaced by political appointees, persons committed to beliefs based on certain ideologies. Respected research findings that contradicted ideological views were removed from official health or environmental public information.[11] Gauchat (2012) documented an increased politicization of public views about science in the United States since the 1980s, with a growing distrust toward science among people who are political conservatives.

Some people with a strongly held political or religious belief cling to their belief despite large amounts of contrary evidence. For example, when Barak Obama ran for U.S. President for a second time in 2012, the so-called "birther movement" continued to claim he was not born in the United States. This was after 4 years of inquiry by dozens of independent investigations, hundreds of news reports, numerous documents and expert testimony, and examination of the issue by the U.S. Supreme Court. All found no evidence for such a claim. Despite serving as president for 4 years, public opinion polls showed that 25 percent of the public (and 45% of self-identified Republicans) said that President Obama had not been born in the United States. Ignoring overwhelming evidence, even elected legislators in a half-dozen states enacted bills on the "birther" issue. As late as September 2016, 21 percent of all registered voters in the United States continued to cling to such an obviously false belief.[12]

We will look at the issue of ideology again in Chapter 3 when we examine social theory. For an example of how the alternatives would explain an aspect of social life, see Table 1.1.

What Research Involves: A Scientific Approach

1.2 Describe the scientific approach to social research.

As the renowned African American folklorist and author, Zora Neal Hurston said, "Research is formalized curiosity. It is poking and prying with a purpose" (Hurston, 1942:143). Social science research relies on the careful study of experiences, events, and facts in the social world. While it helps us answer many questions about the social world, it also raises new questions that can alter how we see the world as well. It relies on the process and evidence of science, thus it may diverge from casual observation, commonsense reasoning, pure logical-rational reasoning (mathematical or philosophical proof), or legal-judicial procedure. We next examine *science* in the context of doing social science research.

Science

When most people hear the word "science," the first image that comes to mind is likely to be a lab with test tubes, electronic equipment and microscopes, exotic space ships, and people in white lab coats. These outward trappings are a part of science. The physical and biological sciences—biology, chemistry, physics, and zoology—deal with the physical and material world (e.g., rocks, plants, chemical compounds, stars, muscles, blood, electricity). Most people first think of them when they hear the word

"science." For example, Krull and Silvera (2013) found that people relied on the outward, visible and superficial aspects of the natural sciences (e.g., equipment, terminology) more than on actual scientific process when they judged whether something was scientific. People also appeared to overrate their scientific knowledge and understanding when they believed that a topic was not highly complex (Scharrer et al., 2014).

The social-cultural sciences (such as anthropology, economics, human geography, psychology, political science, and sociology) involve the study of human social-cultural life: beliefs, behaviors, relationships, interactions, institutions, and so forth. Just as we apply knowledge from the physical and biological sciences in related, more pragmatic fields (such as agriculture, aviation, engineering, medicine, meteorology, and pharmacology), we apply social science knowledge to practical concerns in related applied areas (such as counseling, criminal justice, education, management, marketing, public administration, public health, social work, and urban planning).

Some people call social sciences "soft sciences." This is not because the fields lack rigor but because their subject matter—human social life—is highly fluid, formidable to observe, and difficult to measure precisely. The subject matter of a science (e.g., human attitudes, protoplasm, or galaxies) shapes the techniques and instruments (e.g., surveys, microscopes, or telescopes) it uses. We consider the relationship between the physical and social sciences in Chapter 4.

We need to recognize that science emerged out of a major shift in thinking nearly 500 years ago. It began with the Age of Reason or Enlightenment period in western European history (1600s–1700s). The Enlightenment Era ushered in new thinking that included greater respect for logical reasoning, careful observations of the material world, a belief in human progress, and a questioning of traditional religious and political doctrines. It built on past knowledge and started by studying the natural world. Later it spread to the study of the social world. A dramatic societal transformation, the Industrial Revolution, accelerated the spread of scientific thinking. The advancement of science and related applied fields did not just happen on its own—it was punctuated by the triumphs and struggles of individual researchers. It was also influenced by significant social events, such as war, economic depression, government policies, and shifts in public support.

Before scientific reasoning became widespread, people relied on nonscientific methods. These included the alternatives discussed previously as well as methods less accepted today (e.g., oracles, mysticism, magic, astrology, and spirits). Such systems continue to exist, but science is now generally accepted. We still use nonscientific methods to study topics defined as outside the scope of science (e.g., religion, art, literary forms, and philosophy).

The public today assigns three meanings to science (Gauchat, 2011). Some say that science is a special, highly systematic method for finding or producing knowledge. Others focus on location. They say that science is what takes place in a university or a research laboratory. A third definition focuses on science as a collection of specialized knowledge. This definition contrasts science with other knowledge systems, such as common sense and tradition.

We can define *science* as system for producing knowledge and the body of knowledge that results from such a system. These match two of the public's definitions. The activity of science can occur almost anywhere. Science continues to evolve slowly and has four features: assumptions about the world; accumulated understandings; an orientation toward knowledge; and specific procedures, techniques, and instruments. Science is most tangible and visible as a social institution, the scientific community (see discussion of it later in this section).

The knowledge that science produces is organized into theories and grounded in empirical data. Let us examine three key terms: *theory*, *data*, and *empirical*. Many people confuse theory with opinion, unfounded belief, or wild guess. "Whereas a scientist understands theory to be a well-grounded opinion… the general public understands it as 'just a theory,' no more valid than any other opinion on the matter" (Yankelovich, 2003:8). For now, we can define **social theory** as a coherent system of logically consistent and interconnected ideas used to condense and organize knowledge. You will read about types of social theory in Chapter 3. For now, think of theory as a kind of map that helps us better visualize the complexity in the world, see connections, and explain why things happen. Data help us decide whether a theory is true and we should retain it, or a theory is false and needs adjustments or we should discard it. **Data** are the many forms of empirical evidence or information carefully collected according to the rules or procedures of science. **Empirical** refers to evidence or observations grounded in human sensory experience: touch, sight, hearing, smell, and taste. Scientific researchers cannot use their senses to observe directly some aspects of the world (e.g., intelligence, attitudes, opinions, emotions, power, authority, quarks, black holes of space, force fields, gravity). However, they have created specialized instruments and techniques so they can observe and measure such aspects indirectly.

Data or empirical observations can be *quantitative* (i.e., expressed precisely as numbers) or *qualitative* (i.e., expressed as words, images, or objects). Later in this book, you will see how we can measure aspects of the social world to produce quantitative or qualitative data.

Pseudoscience, Junk Science, and "Real" Science

Across the centuries, science achieved broad respect and acceptance around the globe; however, many people still lack scientific literacy (see Reflection Box 1.3, Scientific

Reflection Box 1.3 Scientific Literacy

For more than 50 years, leading educators, business leaders, and policy makers stressed the need for quantitative and scientific literacy to perform professional work and make daily decisions in a complex world. *Quantitative literacy*, or *numeracy*, is the ability to reason with numbers and other mathematical concepts. A person with quantitative literacy can think in quantitative-spatial terms and apply such thinking to solve problems. They understand how data are gathered by counting and measuring and presented in graphs, diagrams, charts, and tables. A lack of quantitative literacy is called **innumeracy** (Paulson, 1990).

Scientific literacy is the capacity to understand scientific knowledge; apply scientific concepts, principles, and theories; use scientific processes to solve problems and make decisions; and interact in a way that reflects core scientific values (Laugksch, 2000:76). The Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD) carries out international studies of how much students know about science and defines scientific literacy as the following (PISA, 2006:23):

- Scientific knowledge and use of that knowledge to identify questions, acquire new knowledge, explain scientific phenomena, and draw evidence-based conclusions about science-related issues
- Understanding of the characteristic features of science as a form of human knowledge and enquiry
- Awareness of how science and technology shape our material, intellectual, and cultural environments
- Willingness as a reflective citizen to engage in science-related issues and with the ideas of science

People lacking in quantitative and scientific literacy easily accept pseudoscience and make judgment errors. Innumeracy also leads journalists to report inaccurate news and readers/viewers to evaluate the reports without sufficient skepticism. Innumerate people are lousy at assessing risk. As a result, most make poor financial investment decisions, and they often lose money on gambling and related activities because of their weak quantitative reasoning. Such people have little chance to enter a career as a technical–managerial professional in the fast-growing, high-income part of the labor market.

People can use modern technology (e.g., computers, cell phones, iPads, and the like) yet retain prescientific thinking or rely on magic or supernatural beliefs to explain events and make decisions. An ability to use much of advanced technology is possible without scientific literacy.

Although negative stereotypes of scientists have declined (Losh, 2010), only 25–28 percent of American adults qualify as being scientifically literate. This is close to the level of general scientific literacy among adults in other advanced countries. However, international math and science tests for high school students show that United States ranks about twentieth among other nations. On specific scientific ideas, Americans do far worse compared to people in other advanced nations. For example, American adults are near the bottom in endorsing the theory of evolution. A 2012 Gallup poll found that about half of Americans reject the scientific theory of evolution in favor of a religious or faith-based explanation. Although the acknowledgment of evolution increases with education level, its overall acceptance has remained unchanged for 30 years. Well over 90 percent of scientists agree that the earth is getting warmer because of human activity such as burning fossil fuels and this issue has been prominently discussed in the media, but only 49 percent of the public agrees. Despite getting X-rays, only about 10 percent of the U.S. public knows what radiation is and about 20 percent think the sun revolves around the earth—an idea that science abandoned in the seventeenth century. Recent polls found more than one-half of Americans want public schools to teach religious views on scientific questions and favor holding a national mandate that would force K-12 schools to teach anti-scientific thinking.[16]

You may think college students know better. Studies found that many college students used illogical "magic" rather than science-based thinking. They accepted voodoo magical power as a cause of someone becoming ill, and college sports fans believed their thoughts could influence the outcome of a basketball game as they watched it on television (Pronin, Wegner, McCarthy, and Rodriguez, 2006). Most studies attribute the low levels of scientific literacy in the United States to people committed to specific religious beliefs and their political mobilization against nonreligious education. In a study on the issue, Sherkart (2011:1146) concluded, "religious factors have persistent negative effects on scientific literacy" [and] "low levels of scientific literacy in the United States are a substantial barrier to reasoned discourse and informed public action."

Literacy) or confuse real science with **pseudoscience**. The prefix *pseudo* is Greek for false or counterfeit. We face a barrage of pseudoscience through television, magazines, film, newspapers, websites, highly advertised special seminars or workshops, and the like. Some individuals weave the outward trappings of science (e.g., technical jargon, fancy-looking machines, complex formulas and statistics, and white lab coats) with a few scientific facts and myths, fantasy, or hopes to claim a "miracle cure," "new wonder treatment," "revolutionary learning program," "evidence of alien visitors," or "new age spiritual energy." Experts in pseudoscience might even hold an advanced academic degree, but often it is in unrelated academic fields or from a very weak, marginal school.

In addition to experts, magazines, websites, or books offer popularized or "pop" social science. Some of these are accurate popularizations by legitimate social researchers to communicate to a wide public audience. Others look like legitimate social science to a nonspecialist but actually present a distorted picture or a misuse of social science. These authors promote a particular political or social position in the guise of social science and fail to meet the standards of scientific community. For example, the 1994 book *The Bell Curve* made claims of African American intellectual inferiority made the bestseller list, although social scientists found it to be seriously flawed.[13]

Unfortunately, books advertised on television or websites can be filled with opinion, personal beliefs, or seriously flawed research. An unwary consumer can be misled and confuse inaccurate or highly opinionated books with legitimate social science. Schmidt (2012) noted there are two sides to academic publishing, "On one side are authors and publishers who produce nuanced books that offer only conclusions stemming from research, and tend to be too esoteric for wide readership. On the other side are authors and publishers who cash in by producing best-selling polemics, in which research is used to buttress foregone conclusions."[14]

Perhaps you have heard the term **junk science**. Public relations firms created this term in the 1980s as a strategy to denigrate actual scientific evidence. They used the term to attack research findings that scientists presented in courts to document injury or abuses caused by powerful, large corporations. In press releases, such firms manipulated language to contrast *junk* with *sound* science (i.e., studies that supported their own position). *Sound* and *junk* are rhetorical and imprecise terms. More important, the quality, methodology, or precision of the research for each may not differ. Publicists applied the term "junk science" to any research study, no matter how accurate or rigorous, that they opposed. They called "sound science" any research study, no matter how flawed, that favored their position. For example, the tobacco industry used the "junk science" label as a tactic to criticize research on secondhand smoke as they spent tens of millions of dollars to deny the harmful health effects of smoking.[15] Their goal was to confuse juries and the public. They sought to create an impression that scientists lacked consistent research evidence. In contrast to pseudo- or junk science, authentic science comes from the outlook, operations, and products of the scientific community (see the next section).

The Scientific Community

The **scientific community** is a social institution of people, organizations, and roles as well as a set of norms, behaviors, and attitudes that all operate together. It is not a geographic community existing in one physical location nor does everyone know everyone else within it, although its members communicate and interact with one another frequently. Rather, it is a loose collection of professionals who share training, ethical principles, values, techniques, and career paths.[17]

You can think of the community as organized like a series of concentric circles. Its rings or layers depend on the productivity and engagement of researchers. At the core are a small number of highly productive, very creative, and intense leaders. Based on career stage, they slowly move into and out of the core over time depending on their research contributions. Off at the fringe or outermost ring are millions of practitioners, clinicians, and technicians. They use and apply the knowledge, principles, and techniques first developed and refined by those within the core. Professionals who toil on the outer rings develop a level of expertise in and regularly use scientific research principles and techniques; however, their knowledge of science may not be as deep as those in the middle or core. Also, many on the outer rings are less engaged in advancing the frontiers or enterprise of science (i.e., to generate significant new knowledge). Nonetheless, everyone who uses scientific methods, whether at the core, middle layer, or outer fringe, can benefit from learning how the scientific community operates and its key principles.

The scientific community has fuzzy and loosely defined boundaries. There is no membership card or master roster. In some respects, a doctorate of philosophy (Ph.D.) degree in a scientific field is an informal "membership card." The Ph.D. is an advanced graduate degree beyond the master's degree that prepares people to conduct independent research. It typically requires 10–12 years of formal schooling beyond high school. A few members of the scientific community lack a Ph.D. and many people who earn Ph.D.s enter occupations in which they do not conduct research studies. They focus exclusively on teaching, administration, consulting, clinical practice, advising, or sharing knowledge with the wider public. In fact, about one-half of the people who receive scientific Ph.D.s do not follow careers as active researchers.