ONE

Why Research?

It seems that every day brings another report of some research finding. A quick Internet search of news articles that appeared on an otherwise ordinary day in June revealed, among other stories, that California just approved a publicly funded gun research center, the Netherlands began a campaign to identify and reduce research misconduct, a geological study discovered that some parts of the San Andreas Fault are sinking and others are rising, a nutrition study suggested that broccoli is healthier than previously thought because its phenolic compounds have notable antioxidant properties, and a survey revealed that about 31% of people admit to snooping on a friend or loved one by looking at their cell phones. As suggested by just a single day's news coverage, research is a huge enterprise, employing millions of people worldwide and resulting in thousands of reports, articles, and books every year. The American Association for the Advancement of Science (2016) estimates that the US government spends about $70 billion per year on various forms of research.

But many people have questioned the value of some of this funded research. We regularly see debates about the value of research on global warming, firearms, health-care systems, and many other topics. In addition, conservative politicians such as US Senator Tom Coburn of Oklahoma publish annual reports of federal government waste, taking particular glee in pointing out what are considered dubious scientific studies. For example, the 2014 *Wastebook* highlights studies of gambling monkeys, mountain lions on treadmills, and synchronized swimming by brine shrimp. Yet, there is clearly much to be gained from good research. Without it, there is little doubt that death, illness, and injury rates would be much higher. Food production would be substantially lower. The field of forensic science would be much more primitive, thus impeding efforts to solve crimes and catch criminals. Producing

enough power to light homes, operate cars, and run businesses would be much more difficult. The list goes on and on.

Social science often gets a particularly bad rap because some do not consider it a true "science." But it has also contributed not only to making the world a better place, but also to increasing our understanding of the way people, social groups, communities, and institutions function and interact. Let's examine a few examples of social science research to see what it has taught us. As you read the following illustrations, think of what broader implications each has for understanding the social world and perhaps even improving people's lives.

In the mid-1960s, the social psychologist Stanley Milgram wanted to determine how close or far apart people were socially. He devised a project in which he mailed a letter to random people who lived in several Midwestern US cities. The letter asked them if they personally knew an individual—again selected randomly—who lived in Boston, Massachusetts. If they did, they were to send the letter to this person. If not, they were to send the letter to a friend or relative who was more likely to know the person in Boston. He then examined how many times, on average, the letters that reached the person had been sent. This led to the famous phrase about "six degrees of separation," which was based on the average number of times the letter was forwarded (Milgram 1967). Even though the project and its findings have been criticized in the ensuing years (Watts 2004), it has motivated hundreds of subsequent studies on social networks and led to the proliferation of social network analysis as a valuable research tool for the social sciences. In what other ways might social networks be important for understanding the way people interact and how this affects their lives?

In the early 1990s, political scientist Bruce Keith and his colleagues wished to understand better what it means to be a political independent. Whereas many people in the United States identify as a Democrat or a Republican, a plurality claim they are independent and don't identify with either political party. Understanding what this signifies has important implications for voting behavior and the public's support of political figures and their policies. Keith et al. (1992) determined that a large number of independents are actually fairly consistent in voting for Democratic or Republican candidates. Thus, regardless of how they label themselves, only a relatively small percentage of voters are truly "independent." What might this finding suggest for other questions about how people identify with groups and engage in civic life?

Finally, most residents of a town or city can distinguish the "good" neighborhoods from the "bad" neighborhoods. Good neighborhoods tend to be safe, whereas bad neighborhoods tend to be dangerous, places where the risk of falling victim to crime is high. Often, we perceive of bad neighborhoods as those with vacant lots, graffiti, and boarded-up buildings. Sociologists Robert Sampson and Stephen Raudenbush (2004) sought to understand whether these signs of "disorder" were valid markers of dangerous areas. By carefully studying dozens of Chicago neighborhoods, they found that it was less the explicit "dangerousness" of a neighborhood—as measured by criminal activity or physical decay—that predicted whether people judged a neighborhood as qualitatively bad or good, but instead whether there was more poverty and minorities who lived in a neighborhood. In other

words, neighborhoods can get labeled as bad or good based on the types of people who live in them, regardless of how objectively safe they are. What consequences does this finding have for understanding social and ethnic relationships, the health and development of communities, and how the criminal justice system operates?

I hope it is clear that each of these studies, while important in its own right, illustrates the value of social science research. We know that scientific research has led to many improvements in the world, from longer lives due to medical advances to rapid transit from one part of the globe to another. Although perhaps not considered as beneficial, research in the social and behavioral sciences has also led to a better understanding of society, with the potential to improve lives, relationships, and communities. For example, social network studies, many of which are motivated by Stanley Milgram's research, have led to more effective health education and intervention programs (e.g., Kim et al. 2015), thus serving to improve health among underserved groups of people. Sampson and Raudenbush's study might lead to more just policing strategies and help prevent police shootings in minority neighborhoods (a problem that has plagued several US communities over the past few years).

WHY RESEARCH?

Although most of us will never conduct research that is as influential as these notable examples, we may nevertheless find satisfaction in the design and execution of a good research project. Perhaps some of you will also be involved in research that will improve the human condition. This book discusses some of the principles and tools that are at the foundation of social scientific research. Before embarking on this discussion, though, it may be helpful to think a bit more about why we conduct research. Here are four broad reasons (Booth et al. 2008).

- *Research helps us develop a deeper understanding of questions and answers.* This assumes we wish to know the answer to some important questions that research can provide, such as those that involve patterns of behavior, factors that influence social problems, or why some forms of government or social policies seem to work better than others. It is also a good way—some argue a critical way—to identify *facts*: those bits of information for which there is evidence to indicate they genuinely exist. This is often contrasted with *opinions*: beliefs about some issue that depend largely on the holder's point of view. We'll return to the issue of evidence later. Research can be especially important when it comes to studies of health, safety, and economic well-being—research can improve and save lives.
- *Research helps explain the world around us.* Research can help us understand and explain how things operate and why events occur. I may not want to be able to explain something because I wish to change it, but rather simply because I'm

curious about why it operates the way it does. Although this reason is often considered the domain of "pure research" in fields such as physics, many social scientists are also interested in explaining why people or social groups behave or believe the way they do. This is not because they want to change behaviors or beliefs, but rather because they are curious about them. This can be especially satisfying when other people or groups seem different or peculiar from the researcher's perspective. It can help us unmask our own preconceptions about others.

- *Some people find pleasure in solving puzzles.* In the social sciences, researchers often gain satisfaction by answering questions that others have not thought of or have not been able to answer in the past. For example, what, if any, influence do neighborhood factors have above and beyond the influence of families or schools on the way young people behave? If a young person moves from an impoverished neighborhood to a wealthy neighborhood, should we expect her chances of attending college to improve? Or does her likelihood of going to college depend mainly on her family's station and influence? This might be considered a puzzle that has not been solved yet.
- *Research provides a learning environment.* By conducting research, we may learn new and more advanced skills. This furnishes training to conduct more sophisticated forms of research. One way to think about this is that early involvement in research is a type of apprenticeship that might lead to a vocation at which you can excel (or at least support yourself!).

These four reasons need not be independent of one another, though. Someone's pleasure in solving research puzzles may certainly be related to her interest in answering a question or to comprehending how the world and its inhabitants operate.

WHAT IS RESEARCH?

But what do we mean by the term *research*? Most dictionary definitions of this word use terms such a systematic exploration, discovery, or investigation. For example, the *Oxford English Dictionary* (2016) defines the noun form of research as "the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions." In a guide to research practices in the social sciences, DePoy and Gitlin (2016, 3) offer the following definition:

> Research is . . . multiple, systematic strategies to generate knowledge about human behavior, human experience, and human environments in which the thinking and action processes of the researcher are clearly specified so that they are logical, understandable, confirmable, and useful.

In this context, research is a systematic set of transparent procedures designed to produce knowledge. Systematic refers to a fixed plan that can be repeated. Transparent means that the procedures used are clear and understandable. Thus, research is a process of fixed and clear steps that is aimed at revealing something that is unknown, poorly understand, or even to assess a statement of fact ("Watching violent films makes teenagers more aggressive"). Moreover, some suggest that it is fundamentally about identifying a problem and finding a solution (Booth et al. 2008). Research includes many kinds of information or data gathering exercises. In general, we wish to collect information—in a systematic and documentable way—to solve a problem, answer a question, or perhaps even generate more questions.

Research Involves Telling a Story

A useful way of thinking about research is to relate it to telling a story. Simply put, research involves the following: *Something happened, it's important, and I want to tell you about it*. Good stories include *themes*—key things the story tries to tell or teach the reader—and *plots*—information and events that are organized in a logical and recognizable order. Good stories are *narratives*: they connect events, sometimes in clever and unexpected ways. One of the tasks of research is to describe and explain how events are connected. Yet there is often an aspect of research that sets it apart from a story about Uncle Joe and how he lost a family heirloom when he went surfing. Although the heirloom may be valuable to some family members, researchers usually wish to tell stories that are important in a more general sense. As related earlier, Professors Sampson and Raudenbush told a story about how people identify and label Chicago neighborhoods based on the types of people living in them. A theme of this story is that what we perceive with our eyes and interpret with our minds do not necessarily reflect reality. Our general perception of the physical environment is influenced largely by who we see in that environment. In general, research tells stories—like many good stories—about things that apply broadly.

Research Is about Making Comparisons

Research also involves comparisons. When researchers wish to answer a question, such as whether a drug abuse prevention program is effective, they are concerned with comparing those who were exposed to the prevention program to those who were not. Even when they observe only one group, it is important to think about what would have happened to members of that group—or a similar group—if they had had a different experience. Similarly, how does the group under investigation compare to other groups who may behave similarly or who live under similar conditions but behave differently? For example, suppose an ethnographer is studying a group of methamphetamine users in rural Missouri. It is usually helpful—even if only implicitly—to consider how those in this setting compare to those in other settings, such as in inner-city St. Louis or rural South Dakota. How might their use of methamphetamine serve a similar or different purpose than use among other users? Does their motivation to use or eventually abstain differ from the experiences of

others? What implications does the broader social or cultural milieu have for their use vis-à-vis others' use?

A term that is frequently used when thinking about research as a comparison is *counterfactual*. This refers to attempting to infer what would have happened if some other experience than that observed had occurred. For instance, when an experiment is conducted and only one group—the experimental group—is given the stimulus (such as when only one group of people watches a violent encounter), the counterfactual asks what would have happened to those in the comparison group if they had been given the same stimulus. An assumption is that they would have reacted in a similar way—thus demonstrating the same outcome. This assumption is made more realistic by randomization, a process designed to make the groups comparable in most conceivable ways. If they are comparable, then the only difference between them is the stimulus that they experienced. However, we may never observe the true counterfactual (Mumford and Anjum 2013). Yet, imagining it by thinking explicitly about comparisons among research participants is a useful mental exercise that helps answer questions.

Research Is a Type of Argumentation

Another useful way to think about research is that it is a type of argumentation (Booth et al. 2008). Argumentation refers to the process of developing and assessing arguments. However, the type of argument referred to here is not an angry or hostile verbal exchange between two opponents. Rather, we are interested in two relevant types of arguments. The first type, *rhetorical*, provides information—or a set of supporting statements—to persuade someone that some claim is accurate ("ocean waters appear blue because of the way water absorbs light waves"). A *claim* is simply an assertion that something is true. Rhetorical arguments are used in many spheres, from a teacher who tells her students which ethnic groups vote most often in local elections to the radio personality who claims that a politician is wrong on some issue and provides reasons, such as by discussing the politician's voting record and public statements. The second type, *dialogical*, examines different, perhaps opposing, claims and tries to reach agreement on which one is most accurate (Driver et al. 2000). Research is appropriate for evaluating dialogical arguments since it is important to consider alternative explanations for phenomena. Explanatory research is especially well suited for examining *scientific arguments*: the process of using scientific methods to demonstrate that some process or claim is the most reasonable or valid, usually when compared to some alternative process or claim (Khine 2012).

Discussions of argumentation typically identify and distinguish three components: *claims*, *warrants*, and *data*. The following two sentences provide an illustration of an argument:

> Michael Jordan was a better basketball player than Kobe Bryant (claim). He won more NBA championships and most valuable player awards (data) because he was more talented physically, a better team player, and had a stronger drive to succeed (warrants).

Thus, a warrant is a principle or statement that provides a way to connect the claim to the data. It may describe a general source of reasoning that covers a broad area within which the specific claim occurs. For example, to be successful at team sports requires not just physical skills, but also the ability to work well with teammates and to be mentally focused. This general perspective might offer the following warrant that could then be used to support a claim:

> Basketball players, even if they are matched against others who are equal in innate physical ability, are better if they play team ball and have a stronger motivation to succeed. Basketball is not just a physical game, but also a team sport that requires mental discipline and drive.

The data in this context are the facts—the valid pieces of information—that are used to support the claim. The combination of data and warrants provides the *evidence* to bolster the claim. Arguments may also include qualifiers that state the conditions when the argument holds (Jordan was a better NBA player, but he may not have been better than Kobe Bryant in high school or in international play). There might even be situations in which the claim is not accurate (Newton's laws of motion do not operate at the subatomic level; Toulmin 1958).

Research is useful for both developing and testing arguments. Since good research generates good information in the form of data, we may strengthen our arguments by relying on research that supports one view over another. Furthermore, as already mentioned, research is an integral part of examining scientific arguments. When someone proposes an explanation for a physical or social phenomenon—which takes the form of an argument—it may be tested using the methods of research. In particular, research is used to determine whether the evidence—the data and warrants—is valid, and thus whether the claims are accurate. We may check whether Michael Jordan really did win more championships than Kobe Bryant and perhaps even study their actual play to determine who was more physically talented (although subjectivity is likely to creep in). In order to determine if the evidence is valid, it is important to ask some questions: Did it come from a trustworthy source? When was the evidence gathered? From where was it collected? Was it developed based on sound principles of logic and research? What biases or political manipulations may have affected it? Klass (2012, chapter 3) provides a good overview of problems—such as logical fallacies and other issues—that can undercut even the most reasonable arguments and evidence. Several of these that affect the quality of research are discussed in the next section.

Claims and warrants are also used to develop theories. However, there are other components needed as well. How theories and claims are linked to research and the questions that drive it are discussed in chapter 2.

CLASSIFYING RESEARCH

There are various ways of understanding the general purposes of research. This typically involves, though, the type of research undertaken. In most social scientific disciplines,

research is classified into one of three types: exploratory research, descriptive research, and explanatory or analytical research.

Exploratory research involves conducting a background review to gather information about a question or problem and some preliminary steps to try to understand it better. For example, suppose a scholar is interested in the effects of criminal forfeiture laws but has no prior experience conducting research on this topic. She might begin by reading books and research articles, and interviewing a few legislators, judges, attorneys, US Marshals, and those whose property has been seized under these laws. She might also examine one or two court cases that involved the application of these laws. Not only does this lead to a better understanding of the topic, but also suggests the best research method for studying particular questions regarding criminal forfeiture laws. Perhaps our inquisitive scholar decides that a survey is the best way to gather data that can then be used to answer a specific research question. Or an ethnographic study may offer a better approach. Exploratory work is often needed to make informed decisions about how a research project should be conducted (McNabb 2010).

Descriptive research includes gathering information to find out what is happening. It may involve information about a single variable. For example, what percentage of mothers in Canada breastfeed their babies? How long, on average, do they breastfeed? What percentage of young people, ages 12–17, in the state of Colorado have ever drunk an alcoholic beverage? Descriptive research may also include identifying an association between two variables, such as with a correlation coefficient: What is the correlation or statistical association between frequency of alcohol use and grades in school among teenagers? Is teen alcohol use more common in the United States or Canada?

Explanatory or analytical research involves gathering information to determine the causes of or explanations for some phenomenon. Thus, some scholars distinguish descriptive and *causal* research (Remler and Van Ryzin 2015). An explanation provides reasons or interpretations for some observed pattern or phenomenon; it answers questions regarding why or how something occurred ("The Iraqi invasion of Kuwait in 1990 occurred because . . ."). In the social and behavioral sciences, as well as the physical/natural sciences, hypotheses are often used as a way to test a predetermined explanation. A *hypothesis* is a statement about the presumed relationship between two or more variables. It is usually tested by gathering data and determining whether the relationship between the variables matches the predictions of the hypothesis. Nevertheless, most types of studies, even if they use good data, are not, by themselves, sufficient for establishing a causal relationship. This is particularly true in *observational studies*: those projects in which the researcher has little to no control over what conditions participants are exposed to. Since so much social scientific research relies on observational data, this third type is identified best as explanatory research.

There are situations, however, when researchers do have some control over what happens to participants; thus, quasi-experimental and experimental designs are not unknown in the social scientific community. For example, suppose a researcher hypothesizes that moving children from poor neighborhoods to wealthy neighborhoods will make them more likely to graduate from high school or less likely to engage in violent behavior. This hypothesis might

be driven by the researcher's descriptive research; it showed that these children are at risk of dropping out of school or of becoming involved in violent activities. How might this hypothesis be tested? The researcher first takes a randomly selected group of children and moves them (as well as, hopefully, their families) from poor neighborhoods (this must be defined carefully) to wealthier neighborhoods. Then, by comparing these children to those who remained in the poor neighborhoods, the researcher determines whether the evidence supports or refutes the hypothesis. Nevertheless, even if the hypothesis is supported, this type of research should also—if one wishes to move from description to explanation—have a good reason for what it is that underlies the differences among the children, if there are any. In other words, researchers should have a logical set of reasons why or how these changes occurred. This is where theory and conceptualization come into play.

These three categories do not exhaust the possible types of research, however. Some people, for example, are interested primarily in prediction. This may be reasonable in, say, the medical research community. I don't particularly care why ibuprofen cures my headaches; just being able to predict that it will and will not, on the other hand, make me sick or unhealthy in other ways is enough for me. Thus, the fact that some team of medical researchers found out that this medication predicts a cessation of headaches is sufficient. Yet, prediction has also become a common goal in the growing field of *data mining* (also called *data analytics* or by the euphemism "big data"). Data mining is a general method for uncovering patterns in large datasets (Han et al. 2012). In practice, this usually involves developing statistical models that predict some outcome with a relatively high degree of accuracy. Although it is a technique that is beginning to make headway in the social sciences (Attewell and Monaghan 2015), data mining is used most often to help companies to predict the characteristics of their customers, such as what products they are most likely to purchase. There are certainly analogous situations faced by social scientists, but most of these researchers are concerned with developing reasonable explanations of phenomena.

Another type of research involves advocacy. Perhaps the best-known example of advocacy research is practiced in the legal profession (Firebaugh 2008). A defense attorney, for example, conducts research in order to help her client stay out of jail; this type of research typically involves searching for evidence that shows that the client did not commit the crime (or that contradicts the opposing attorney's evidence). This is not to say that the legal profession engages only in advocacy research (reading of a few law review articles quickly dispels this impression), only that it is a common method in an adversarial system. Yet members of the social science community would not be satisfied with such a one-sided effort. Instead, social scientists are supposed to consider all reasonable evidence, including that which might cast doubt on a hypothesis or favored answer to a research question. To do otherwise is a violation of the tenets and ethical guidelines of most social and behavioral science disciplines.

There are several other ways of classifying research, with a common approach concerned with distinguishing various research methods. Since an assumption is that readers have already had some experience with a research methods course, they are not covered in any

detail here. Many books on research methods offer a good overview of the different approaches used in the social and behavioral sciences, such as experiments, observational studies, case studies, and qualitative or ethnographic methods (see Ragin and Amoroso 2011; Remler and Van Ryzin 2015).

This book, although it contains strategies and principles that can help with several of these types of research, is concerned mainly with descriptive and explanatory research. In other words, one of its initial purposes is developing and examining research questions that presuppose that some level of exploratory research has already been completed, but that does not have mere prediction or advocacy as its end goal. Furthermore, as mentioned in the preface, the techniques discussed in the following chapters are designed chiefly for data that are quantitative or include only a relatively small number of qualitative categories.

IMPEDIMENTS TO CONDUCTING SOUND RESEARCH

Now that we've defined research, discussed a few of its characteristics, and classified its different types, it is important to consider some common obstacles to conducting quality research. In this age of electronic communication, quick access to information (which can be overwhelming), and publication glut, it is easy to fall into a trap of emphasizing research quantity over quality. The tools available for conducting some modicum of research have become relatively simple to use, and we are awash in data that appear to be easy to analyze and mine for seemingly important findings. I had a colleague who once, as a practical joke, claimed that there was a new statistical program called "hypothesis test." It was advertised in a flyer that my friend posted near a university computer lab as a method for generating hypotheses and using readily available datasets to prove their validity. He told me that people flocked to his office to get their hands on this program so they could use it as the basis for writing research reports (publishing articles and achieving tenure is of utmost importance!). This illustrates an unfortunate situation: many researchers wish to find a simple path to achieving research results. Yet, as some smart people have reminded us, "research is hard" and it is even harder to conduct cutting-edge research (Gelman and Loken 2014, 464; Schwartz 2008). With this in mind, the following describes some common impediments to sound research.

Heuristics, Assumptions, and Cognition Traps

Heuristics are simple rules that are usually the result of socialization and evolutionary processes. They help explain how people make decisions, arrive at judgments, and solve problems, especially when they are faced with complex challenges or incomplete information. For example, when confronted with some statement of fact, a person might judge it based on examples that come easily to mind (the *availability heuristic*). Someone is told that a school shooting has occurred and this triggers her to think that the perpetrator is a young male with mental health problems. Heuristics often work well to simplify decision-making but may also lead to biases. Assumptions play a similar role: they are conditions or associations

that are taken for granted irrespective of the evidence. For example, people often assume that individuals' gender or ethnicity allow a quick judgment of their involvement in legitimate or deviant behaviors. This might lead to a disproportionate research emphasis on deviant behavior among people of color or on females as caregivers. In general, humans seem to be hardwired to create stories about events from incomplete or even faulty evidence (Kahneman 2011). As an example of the risk of assumptions, for many years medical research focused mainly on men, with the notion that the findings could be generalized to women. We have since learned that this is normally not the case (Torpy et al. 2003).

Heuristics and assumptions, when they are based on flawed logic or evidence, can lead to *cognition traps* (Shore 2008). These are approaches to problems that are inflexible or grounded in rigid views of how the world operates. For instance, some people see the world in binary terms: good or evil, nice people versus ill-mannered people. Yet the world tends to be much more nuanced and complex than this. As the social sciences teach us, people or social groups may be magnanimous or selfish depending on the circumstances they find themselves in. One way to avoid these traps is to realize that what makes people and groups do the things they do is complicated and can rarely be narrowed down to a single cause or personal trait. In addition, we need to avoid the tendency that what we would have done in a particular situation is somehow rational or unbiased, so that what others do, if they take another path, is irrational. Yet this is a common outcome of *ethnocentrism*: viewing others based on one's own cultural or social standards.

A similar problem can occur when we hold strong ideological views. It is often difficult for people to let go or modify their assumptions about some outcome or piece of information—such as whether a social policy is worth implementing—when they adhere strongly to, say, a traditional or progressive view of the way the world (should) work. In fact, there is a psychological phenomenon known as the *backfire effect* that can be a key problem for both generating research and convincing others of the accuracy of research. The backfire effect occurs as people reject valid evidence that does not support their beliefs and actually develop even stronger beliefs that favor their position (Nyhan and Reifler 2010). For instance, someone who is already convinced that American Pit Bull Terriers are the most vicious dogs, but is presented with evidence that they are actually no more aggressive than several other breeds (Duffy et al. 2008), may actually end up with a stronger belief about their viciousness. Good social researchers try to avoid the cognition traps and be on the lookout for backfire effects by considering various points of view. As mentioned later, researchers should also consider whether their audience might also be affected by these issues.

Not Understanding What Has Already Been Done

This is why reading the research literature on a topic is so important. We need to know what others have done before us in order to identify the unanswered questions. Suppose a researcher wishes to conduct a study of why people join a particular group, such as a religious organization. Before embarking on this study, he should determine whether

others have conducted similar research so that his work is original and not redundant, or whether more research is needed on this issue. As suggested earlier, this mandates that some exploratory research is carried out prior to developing one's own research project. Of course, it is easy to get overwhelmed by the research literature, especially when considering commonly studied phenomena. A strategy that often takes substantial practice to develop is learning how to read the literature in one's field (Shore 2016). This is discussed a bit later with an eye toward using previous studies to develop interesting and important research questions.

Poor Data

We may have a fantastic research question that is original and timely, but unless we have good data that effectively measure the phenomena we're interested in, we cannot adequately answer questions, test hypotheses, or solve problems. A key challenge for the social sciences is whether we can accurately measure phenomena we're interested in. Some things are simply so vague as to make measurement extremely difficult; others are hard to pin down since they may shift quickly. We also often rely on individuals to tell us how they feel, what opinion or belief they hold, or what they did during a certain period of time. This is affected, however, by many things, such as their understanding of the words that make up the question, their memories, their mood, and their motivation to provide valid answers. As the noted anthropologist Margaret Mead purportedly said, "What people say, what people do, and what they say they do are entirely different things." In general, a vital concern is whether we are measuring what we think we are measuring (e.g., happiness, depression, juvenile delinquency). Moreover, researchers often rely on data from samples. This leads to questions regarding what the sample represents, how it was selected, whether it is biased in some way, and several other conditions. Thus, a good understanding of questionnaire design, measurement strategies, and sampling is needed in order to conduct sound research. There are many excellent books available that instruct researchers about how to choose samples and collect good data (e.g., Bradburn et al. 2004; Groves et al. 2009).

Poor or Ill-Suited Methods

We may have a good research question and sound data, but if the methods used to conduct the research are of poor quality or not suited to the task, we may be misled by the results of the research. In general, it is important to use a method that is best designed to answer the research question or solve the research problem (Leek and Peng 2015). If one wishes to document the number of violent crimes in a city over a certain time period, an ethnographic study is unlikely to be useful. However, if one wishes to understand how people in a particular neighborhood tolerate or ignore the violence that occurs around them, then an ethnographic study is likely a good choice. Similarly, in the study described earlier, Sampson and Raudenbush (2004) used surveys and systematic observations of neighborhood conditions to study people's perceptions. This was appropriate given the researchers' goals. However, it would have been impractical to rely only on an ethnographic study or an experimental

method to gauge people's perceptions in the numerous Chicago neighborhoods. Once again, a solid understanding of the strengths and weaknesses of various research methods is a crucial part of executing and completing good research.

A Boring, Irrelevant, or Unanswerable Question or Problem

We might avoid cognition traps, have wonderful data, and utilize suitable methods, but sound research also requires an interesting or important question. Some research is simply not that interesting; the story it tells is boring. Or the research addresses an overly narrow phenomenon. Do people really care if travelers prefer seeing cows or goats when driving along rural roads in Nebraska? Some answers are also obvious or are so well known that more research is not needed. We know that practicing Mormons are less likely to drink alcohol than practicing Catholics; we don't need a research project to demonstrate this. The following section and the next chapter discuss a few ways to develop research questions that are at least somewhat exciting (to some people) and relevant. However, this should not be taken to imply that all research must be innovative. As discussed later, replication of research studies is a crucial endeavor that is not emphasized enough in the social sciences, yet is fundamental to the advancement of scientific understanding.

In addition, it is not uncommon to have an interesting question that simply cannot be answered with the tools available to social scientists. Although the social and behavioral sciences have made great strides in developing innovative research tools—often by borrowing techniques from other disciplines—there are still some things that are very difficult to do.

Impatience

As mentioned earlier, doing good research is hard. It takes skill, motivation, and patience. Yet, the demands on one's time are often onerous. Students usually have many tasks to complete by the end of a semester or before their graduate school funding runs out. Academic researchers are under pressure to publish regularly in order to get tenure, be promoted, and receive salary increases. Researchers who work in the private sector or for think tanks are often expected to win grants and contracts, get patents, and produce reports. Thus, there is constant pressure to complete research projects and write reports or articles. Unfortunately, this concern with haste may lead to shortcuts, errors, and misleading results. In one notable example, two Harvard economists published a research paper in which they showed that nations with high levels of debt had slower economic growth. It was subsequently discovered that an error in an MS Excel spreadsheet affected this finding; when it was corrected, there was little effect of debt on growth; in fact, it may have been the other way around, with growth affecting debt (Bell et al. 2015). Although it's not clear whether this error was the result of impatience, it demonstrates the importance of being careful with the data used in research projects. As carpenters have taught for years, measure twice, cut once. Or more to the point: check the data several times before beginning the analysis and be careful and systematic with the analysis.

HOW CAN WE MAKE RESEARCH INTERESTING AND PERSUASIVE?

A key goal of this book is to provide some helpful guidance on how to match your research aims with data. At this point, though, it is useful to consider the audience for your research. What are some general steps that will show people that your research is interesting and that they should care about what you are doing? The late Wayne Booth and his colleagues (2008) note that when we conduct and present research we should imagine having a conversation with members of an audience (which might include other researchers, policymakers, funding agencies, or the public). Thus, in order to persuade them that the research is important, try to connect with them in some way. What information should you provide them with that is most persuasive and comprehensible? First, consider their expertise, interests, and background. Are they experts on the topic? Should they be concerned with the topic in general or with specific aspects of it? Could they have preconceived notions or biases about the topic, such as those that might lead to cognition traps or backfire effects?

As you consider these issues, think about how they might affect your ability to impart one of more or more of the following.

- *I've found something interesting.* It's crucial to think about how you can interest the audience in what you've found. It is not unlike being a salesperson, as unfortunate as this may sound. It also requires that you present the information clearly. This might include a well-written document or a carefully prepared presentation. Chapters 8–10 discuss some principles and tools for effective data presentation.
- *I've found a solution to a problem that is (or should be) important to you.* This is particularly vital in a business environment or when interacting with an audience interested in public policy. For example, in an earlier phase of my life, I worked for a nonprofit organization that conducted research for several government agencies. Most of their staff members were interested in practical issues, such as what policies are most effective and efficient for reducing adolescent tobacco use, alcohol use, or other risky behaviors. They wanted to know where they should target their limited resources to make a difference that is measurable and satisfactory. How could they make their constituents (e.g., the public, legislators) happy or at least convince them that they were doing something useful with tax dollars? Hence, they needed to be convinced that the research that my organization conducted aligned with these goals. To use one example, it was much more important to this audience that we studied whether a cost-efficient community prevention program led to reductions in teen tobacco use than to do research on identifying the strongest statistical predictors of teen smoking.
- *I've found an answer to an important question.* This is what academic researchers probably spend most of their time on. The goal is to solve a conceptual problem; one that requires additional knowledge because we don't have a complete

> understanding of it. This doesn't have to be "pie in the sky" work or fall under the designation "pure research" because a research project might, eventually, influence the development of practical solutions, effective policies, or answers to broader questions. For example, suppose someone conducts a descriptive study on homeless people living under bridges in San Francisco. This researcher may simply be interested in describing the types of people who live in these conditions. Do they tend to be males or females? Natives of San Francisco or from elsewhere? What is their range of ages and educational backgrounds? Although this research might have begun as a way to satisfy the researcher's intellectual curiosity, the study's findings may end up affecting subsequent research as well as policies regarding the homeless in general (e.g., what are their main health problems and treatment needs? How did they end up homeless in the first place?). Thus, just because a research project might seem to offer little to the practically minded person, it may make an important contribution at some future point (Booth et al. 2008, 19–20).

Hence, one of the keys to making our research interesting is to consider how to convince our audience that what we are doing is—at least potentially—important. Of course, some researchers find satisfaction when they've discovered something that simply seems interesting to them. But, more often than not, there is an audience that will share this interest; the trick is to find out who belongs to this audience and then find a way to reach them.

THE RESEARCH PROCESS

Books on research methods and on research, in general, describe the steps to conducting a study (O'Leary 2014). We shall refer to this as the *research process*, but it has also been called *research design* (Ragin and Amoroso 2011). It may be defined as the planning and execution of a project that is intended to answer a research question, solve a research problem, or test a hypothesis. A diagram of the research process is shown in figure 1.1. Note some of its important characteristics. The first two stages might be considered exploratory research, but should also include some of the suggestions outlined earlier to ensure that the research is interesting and persuasive, as well as not overly redundant. Moreover, before one acquires the data, it is important to have a clear data collection and analysis plan. Too often, researchers rely on a favored method or analysis technique without carefully considering if the methods match the type of data that should be collected or the research goals.

The sixth step in figure 1.1 is called *workflow*. As mentioned in the preface, this term has been borrowed from organizational studies to address some of the steps that researchers should take to during the course of a study (Kirchkamp 2013; Long 2009). However, it may be considered a subset of the research process since it is concerned mainly with how the data are treated as part of the overall project. In particular, this focuses on the flow once data have been acquired through project completion. Since project workflow plays such a central role

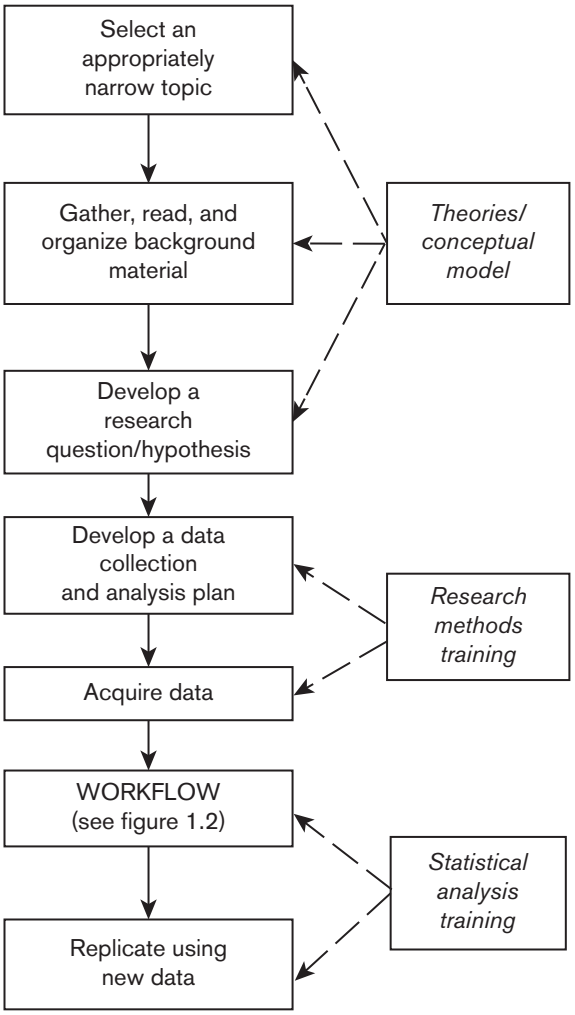

FIGURE 1.1 The research process.

in this book, figure 1.2 provides a diagram of some specific steps. Similar to the research process diagram, figure 1.2 is a bit misleading because, for most research projects, there is significant interplay among the steps. For instance, once one examines the data, it may be necessary to go back to the organization and cleaning stage. Similarly, a reviewer may point out at the presentation stage some problem with the analysis that necessitates going back to the methods or analyzing data stage. The sharing data stage is omitted by many researchers—perhaps for confidentiality or proprietary reasons—yet, when part of the workflow, it allows for *reproducibility* of the results. This refers to allowing other researchers access to the data and computer code so that they may validate the results and determine if they depend on peculiarities of the analysis (Kass et al., 2016; Peng et al. 2006). Note that it is not the same are replication since it does not involve new data.

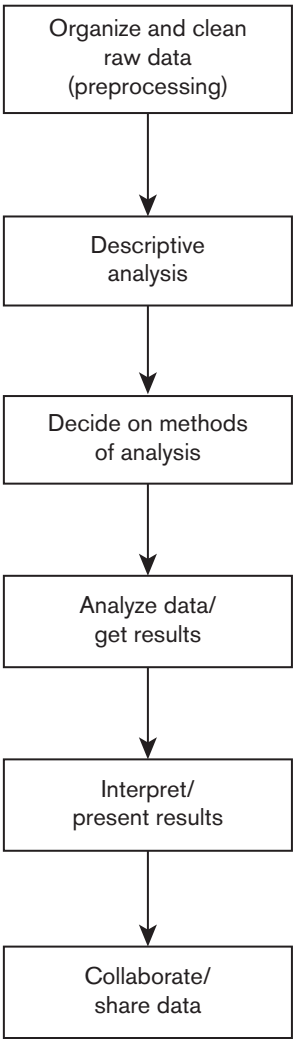

FIGURE 1.2 Research project workflow.

SOURCE: Adapted from Kirchkamp (2013, 8).

FINAL WORDS

Research is a valuable activity that involves identifying a question to be answered, a hypothesis to be tested, or a problem to be solved. It requires careful consideration of what is already known about a phenomenon, appropriate data in some form that may be used to get an answer to the question or help us understand the problem better, and tools to analyze the data in some manner and present the results of the analysis. This book focuses on questions and problems that may be examined using quantitative data. This chapter presents some ways to think about research, some impediments to quality research, and some methods to ensure that our research is timely and important. The next chapter explores how to develop and refine research questions by identifying topics, drawing on theory, building maps and conceptual models, and considering the role of arguments.

EXERCISES FOR CHAPTER 1

1. Select three or four articles from a recent issue of one of the prominent journals in your field. For example, if you are a sociologist, you might select the *American Journal of Sociology* or the *American Sociological Review*. Or, if you are a political scientist, you might choose the *American Political Science Review* or the *American Journal of Political Science*. Browse the articles and attempt to classify the research presented in them as exploratory, descriptive, or explanatory. Do you see any examples where more than one type occurs in the same article?
2. Look up a legal brief. A brief is a legal document that is presented to a court and argues why one side should win the case. Review the brief to get a flavor for how research may be used as advocacy. Contrast this with the way you might conduct research on the topic of the court case using a more balanced approach.
3. Using a favorite hobby, sport, or another area of interest, develop an argument that includes the three components discussed earlier: claims, warrants, and data. Discuss what additional evidence would be needed to evaluate your argument.
4. Locate and read an article from a media source that you think is biased in some way. For example, perhaps you think a certain online magazine is biased in a politically or socially conservative or liberal direction. Try to identify some assumptions and cognition traps the author tends to make or fall into. What is an example of a backfire effect that might result if someone was presented with information from this article?
5. Using one of the articles you selected in exercise 1, consider the steps described in it in terms of the research project workflow (figure 1.2). Which steps are described well? Which steps are unclear or not described at all? Do the authors provide instructions about how to access their data so that one may reproduce their results? If not, try to locate an article in one of your discipline's journals that does describe a way to access the data used in the analysis.