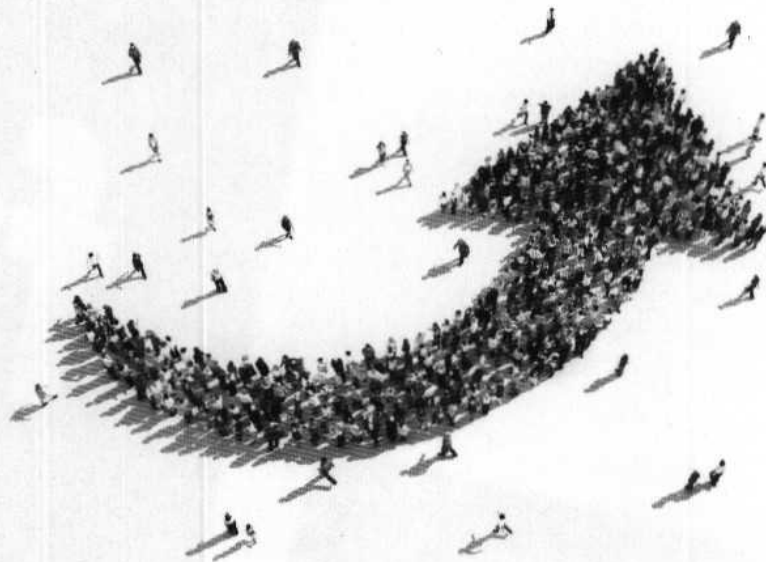


THE PROCESS AND PROBLEMS OF SOCIAL RESEARCH

LEARNING OBJECTIVES

1. Name the three characteristics of a good research question.
2. Define *theory*.
3. Contrast the process of research reflecting deductive reasoning with that reflecting inductive reasoning.
4. Understand why an explanation formulated after the fact is necessarily less certain than an explanation presented before the collection of data.
5. Diagram the research circle, and explain the role of replication in relation to that circle.
6. Distinguish research designs using individuals and groups, and explain their relation to the ecological and individualist fallacies.
7. Understand the differences between cross-sectional research designs and the three types of longitudinal research design.



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In Chapter 1, we introduced the reasons *why* we do social research: to describe, explore, explain, and evaluate. Each type of social research can have tremendous impact. Alfred Kinsey's descriptive studies of the sex lives of Americans, conducted in the 1940s and 1950s, were at the time a shocking exposure of the wide variety of sexual practices that apparently staid, "normal" people engaged in behind closed doors, and the studies helped introduce the unprecedented sexual openness we see 70 years later (Kinsey, Pomeroy, and Martin 1948; Kinsey, Pomeroy, Martin, and Gebhard 1953). At around the same time, Gunnar Myrdal's exploratory book, *An American Dilemma* (1944/1964), forced our grandparents and great-grandparents to confront the tragedy of institutional racism. Myrdal's research was an important factor in the 1954 Supreme Court decision *Brown v. Board of Education of Topeka*, which ended school segregation in the United States. The explanatory *broken windows* theory of crime, which was developed during the 1980s by George L. Kelling and James Q. Wilson (1982), dramatically changed police practices in our major cities. The theory's usefulness in reducing crime, and on feeding controversial "stop and frisk" programs, is hotly debated both in academic journals (Sampson and Raudenbusch 1999) and on the front pages of newspapers (Goldstein 2014). Evaluative social research actively influences advertising campaigns, federal housing programs, the organization of military units (from U.S. Army fire teams to U.S. Navy submarine crews), drug treatment programs, and corporate employee benefit plans.

We now introduce the *how* of social research. In this chapter, you will learn about the process of specifying a research question, developing an appropriate research strategy and design with which to investigate that question, and choosing appropriate units of analysis. By the chapter's end, you should be ready to formulate a question, to design a strategy for answering the question, and to begin to critique previous studies that addressed the question.

WHAT IS THE QUESTION?

A **social research question** is a question about the social world that you seek to answer through the collection and analysis of firsthand, verifiable, empirical data. Questions like this may emerge from your own experience, from research by other investigators, from social theory, or from a *request for research* issued by a government agency that needs a study of a particular problem.

Some researchers of the health care system, for example, have had personal experiences as patients with serious diseases, as nurses or aides working in hospitals, or as family members touched directly and importantly by doctors and hospitals. These researchers may want to learn why our health care system failed or helped them. Feminist scholars study violence against women in hopes of finding solutions to this problem as part of a broader concern with improving women's lives. One colleague of ours, Veronica Tichenor, was fascinated by a prominent theory of family relations that argues that men do less housework than women do because men earn more money; Professor Tichenor did research on couples in which the woman made far more money than the man to test the theory. (She found, by the way, that the women still did more of the housework.) Some researchers working for large corporations or major polling firms conduct marketing studies simply to make money. So, a wide variety of motives can push a researcher to ask research questions.

Social research question:

A question about the social world that is answered through the collection and analysis of firsthand, verifiable, empirical data.

A good research question doesn't just spring effortlessly from a researcher's mind. You have to refine and evaluate possible research questions to find one that is worthwhile. It's a good idea to develop a list of possible research questions as you think about a research area. At the appropriate time, you can narrow your list to the most interesting and feasible candidate questions.

What makes a research question "good"? Many social scientists evaluate their research questions in terms of three criteria: *feasibility* given the time and resources available, *social importance*, and *scientific relevance* (King, Keohane, and Verba 1994):

- Can you start and finish an investigation of your research question with available resources and in the time allotted? If so, your research question is feasible.
- Will an answer to your research question make a difference in the social world, even if it only helps people understand a problem they consider important? If so, your research question is socially important.
- Does your research question help resolve some contradictory research findings or a puzzling issue in social theory? If so, your research question is scientifically relevant.

Here's a good example of a question that is feasible, socially important, and scientifically relevant: Does arresting accused spouse abusers on the spot prevent repeat incidents? Beginning in 1981, the Police Foundation and the Minneapolis Police Department began an experiment to find the answer. The Minneapolis experiment was first and foremost scientifically relevant: It built on a substantial body of contradictory theory regarding the impact of punishment on criminality (Sherman and Berk 1984). Deterrence theory predicted that arrest would deter individuals from repeat offenses, but labeling theory predicted that arrest would make repeat offenses more likely. The researchers found one prior experimental study of this issue, but it had been conducted with juveniles. Studies among adults had not yielded consistent findings. Clearly, the Minneapolis researchers had good reason for conducting a study.

As you consider research questions, you should begin the process of consulting and then reviewing the published literature. Your goal here and in subsequent stages of research should be to develop a research question and specific expectations that build on prior research and to use the experiences of prior researchers to chart the most productive directions and design the most appropriate methods. Appendix A describes how to search the literature, and Chapter 13 includes detailed advice for writing up the results of your search in a formal review of the relevant literature.

WHAT IS THE THEORY?

Theories have a special place in social research because they help us make connections to general social processes and large bodies of research. Building and evaluating theory is, therefore, one of the most important objectives of social science. A social theory is a logically interrelated set of propositions about empirical reality (i.e., the social world as it actually exists). You may know, for instance,

Theory:

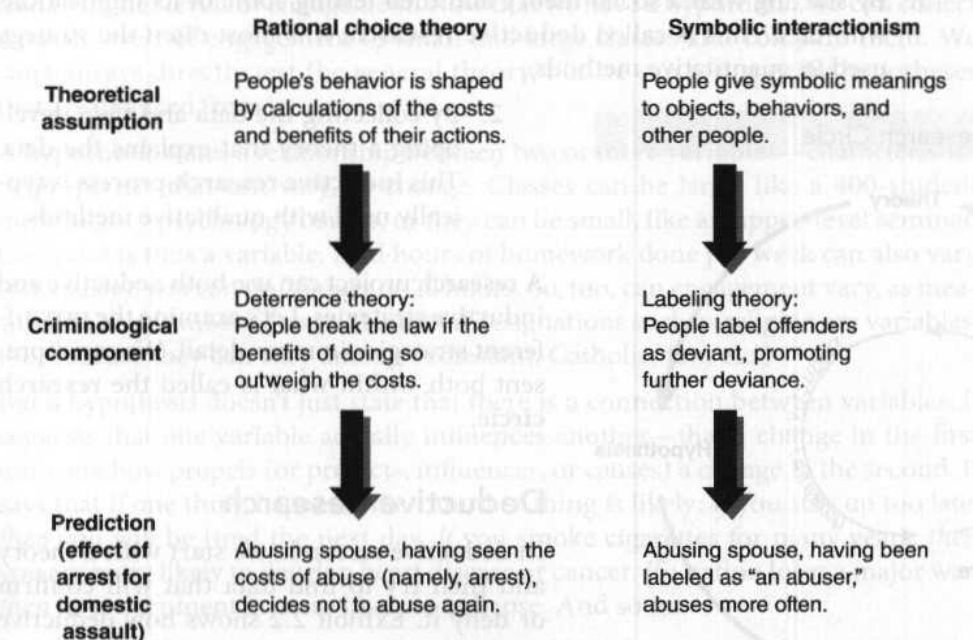
A logically interrelated set of propositions about empirical reality.

about conflict theory, which proposes that (1) people are basically self-interested, (2) power differences between people and groups reflect the different resources available to groups, (3) ideas (religion, political ideologies, etc.) reflect the power arrangements in a society, (4) violence is always a potential resource and the one that matters most, and so on (Collins 1975). These statements are related to each other, and the sum of conflict theory is a sizable collection of such statements (entire books are devoted to it). Dissonance theory in psychology, deterrence theory in criminology, and labeling theory in sociology are other examples of social theories.

Social theories suggest the areas on which we should focus and the propositions that we should consider testing. For example, Lawrence Sherman and Richard Berk's (1984) domestic violence research in the Minneapolis spouse abuse experiment was actually a test of predictions that they derived from two varying theories on the impact of punishment on crime (Exhibit 2.1).

Deterrence theory expects punishment to deter crime in two ways. General deterrence occurs when people see that crime results in undesirable punishments—that “crime doesn’t pay.” The persons who are punished serve as examples of what awaits those who engage in proscribed acts. Specific deterrence occurs when persons who are punished decide not to commit another offense so they can avoid further punishment (Lempert and Sanders 1986: 86–87). Deterrence theory leads to the prediction that arresting spouse abusers will lessen their likelihood of reoffending.

Exhibit 2.1 /// Two Social Theories and Their Predictions About the Effect of Arrest on Domestic Assault



Source: Data from Sherman, Lawrence W., and Richard A. Berk. 1984. The specific deterrent effects of arrest for domestic assault. *American Sociological Review* 49: 267.

Labeling theory distinguishes between primary deviance, the acts of individuals that lead to public sanction, and secondary deviance, the deviance that occurs in response to public sanction (Hagan 1994: 33). Arrest or some other public sanction for misdeeds labels the offender as deviant in the eyes of others. Once the offender is labeled, others will treat the offender as a deviant, and the offender is then more likely to act in a way that is consistent with the deviant label. Ironically, the act of punishment stimulates more of the very behavior that it was intended to eliminate. This theory suggests that persons arrested for domestic assault are more likely to reoffend than are those who are not punished, which is the reverse of the deterrence theory prediction.

How do we find relevant social theory and prior research? You may already have encountered some of the relevant material in courses pertaining to research questions that interest you, but that won't be enough. The social science research community is large and active, and new research results appear continually in scholarly journals and books. The World Wide Web contains reports on some research even before it is published in journals (like some of the research reviewed in Chapter 1). Conducting a thorough literature review in library sources and checking for recent results on the web are essential steps for evaluating scientific relevance. (See Appendix A for instructions on how to search the literature and the web.)

Deductive research:

The type of research in which a specific expectation is deduced from a general premise and is then tested.

Inductive research:

The type of research in which general conclusions are drawn from specific data.

Research circle:

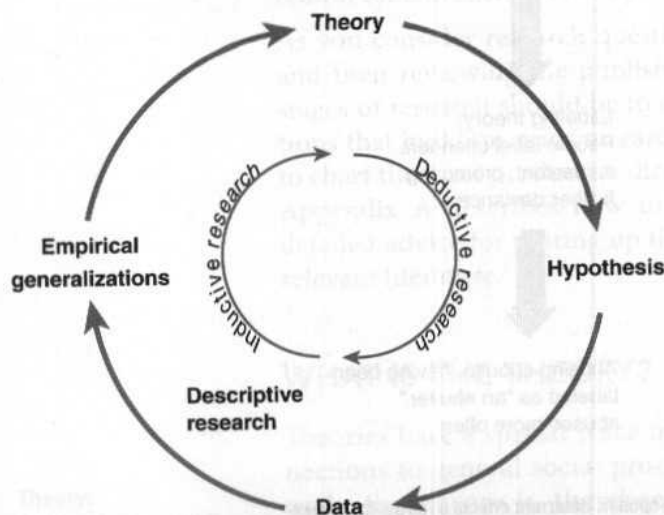
A diagram of the elements of the research process, including theories, hypotheses, data collection, and data analysis.

WHAT IS THE STRATEGY?

When conducting social research, we try to connect theory with empirical data—the evidence we obtain from the real world. Researchers may make this connection in one of two ways:

1. By starting with a social theory and then testing some of its implications with data. This is called **deductive research**; it is most often the strategy used in quantitative methods.
2. By collecting the data and then developing a theory that explains the data. This **inductive research** process is typically used with qualitative methods.

Exhibit 2.2 /// The Research Circle



A research project can use both deductive and inductive strategies. Let's examine the two different strategies in more detail. We can represent both within what is called the **research circle**.

Deductive Research

In deductive research, we start with a theory and then try to find data that will confirm or deny it. Exhibit 2.2 shows how deductive research starts with a theoretical premise and logically *deduces* a specific expectation. Let's begin with an example of a theoretical idea:



In the News

Research in the News

Control and Fear: What Mass Killings and Domestic Violence Have in Common

The June 2016 Pulse nightclub massacre in Orlando, Florida, was committed by a man, Omar Mateen, who had beaten his wife severely until she left him in 2009. FBI data reveal that a family member of the perpetrator was one of the victims in 57% of mass shootings, and social science research

suggests that a desire for extreme control is a common factor in "intimate terrorism" and mass terrorism.

For Further Thought

1. Does the proposal that these two forms of violence may stem from a similar underlying orientation make sense to you? Why or why not?
2. What type of research could improve understanding of this possible link between domestic and mass violence?

News Source: Taub, Amanda. 2016. Control and fear: What mass killings and domestic violence have in common. *New York Times*, June 15.

When people have emotional and personal connections with coworkers, they will be more committed to their work. We could extend this idea to college life by deducing that if students know their professors well, they will be more engaged in their work. And from this, we can deduce a more specific expectation—or hypothesis—that smaller classes, which allow more student–faculty contact, will lead to higher levels of engagement. Now that we have a hypothesis, we can collect data on levels of engagement in small and large classes and compare them. We can't always directly test the general theory, but we can test specific hypotheses that are deduced from it.

A **hypothesis** states a relationship between two or more **variables**—characteristics or properties that can vary, or change. Classes can be large, like a 400-student introductory psychology course, or they can be small, like an upper-level seminar. Class size is thus a variable. And hours of homework done per week can also vary (obviously); you can do 2 hours or 20 hours. So, too, can engagement vary, as measured in any number of ways. (Nominal designations such as religion are variables, too, because they can vary among Protestant, Catholic, Jew, etc.)

But a hypothesis doesn't just state that there is a connection between variables; it suggests that one variable actually influences another—that a change in the first one somehow propels (or predicts, influences, or causes) a change in the second. It says that *if* one thing happens, *then* another thing is likely: *If* you stay up too late, *then* you will be tired the next day. *If* you smoke cigarettes for many years, *then* you are more likely to develop heart disease or cancer. *If* a nation loses a major war, *then* its government is more likely to collapse. And so on.

So in a hypothesis, we suggest that one variable influences another—or that the second in some ways "depends" on the first. We may believe, again, that students' reported enthusiasm for a class "depends" on the size of the class. Hence, we call

Hypothesis:

A tentative statement about empirical reality involving a relationship between two or more variables. *Example:* The higher the poverty rate is in a community, the higher the percentage will be of community residents who are homeless.

Variable:

A characteristic or property that can vary (take on different values or attributes). *Examples:* poverty rate, percentage of community residents who are homeless.

enthusiasm the dependent variable—the variable that *depends* on another, at least partially, for its level. If cigarettes damage your health, then health is the dependent variable; if lost wars destabilize governments, then government stability is the dependent variable.

Dependent variable:

A variable that is hypothesized to vary depending on or under the influence of another variable.

Example: percentage of community residents who are homeless.

Independent variable:

A variable that is hypothesized to cause, or lead to, variation in another variable.

Example: poverty rate.

Direction of association:

A pattern in a relationship between two variables—that is, the value of a variable tends to change consistently in relation to change in the other variable. The direction of association can be either positive or negative.

The predicted result in a hypothesis, then, is called the **dependent variable**. And the hypothesized cause is called the **independent variable** because in the stated hypothesis, it doesn't depend on any other variable. For instance, if we hypothesize that poverty leads to homelessness, then the poverty rate would be the independent variable, and the homeless rate would be the dependent variable.

These terms—*hypothesis*, *variable*, *independent variable*, and *dependent variable*—are used repeatedly in this book and are widely used in all fields of natural and social science, so they are worth knowing well!

You may have noticed that sometimes an increase in the independent variable leads to a corresponding increase in the dependent variable; in other cases, it leads to a decrease. An increase in your consumption of fatty foods will often lead to a corresponding increase in the cholesterol levels in your blood. But an increase in cigarette consumption leads to a decrease in health. In the first case, we say that the **direction of association** is positive; in the second, we say it is negative. Either way, you can clearly see that a change in one variable leads to a predictable change in the other.

In both explanatory and evaluative research, you should say clearly what you expect to find (your hypothesis) and design your research accordingly to test that hypothesis. Doing this strengthens the confidence we can place in the results. So the deductive researcher (to use a poker analogy) states her expectations in advance, shows her hand, and lets the chips fall where they may. The data are accepted as a fair picture of reality.

Domestic Violence and the Research Circle

The Sherman and Berk (1984) study of domestic violence is a good example of how the research circle works. Sherman and Berk's study was designed to test a hypothesis based on deterrence theory: Arrest for spouse abuse reduces the risk of repeat offenses. In this hypothesis, arrest or release is the independent variable, and variation in the risk of repeat offenses is the dependent variable (it is hypothesized to depend on arrest).

Sherman and Berk (1984) tested their hypothesis by setting up an experiment in which the police responded to complaints of spouse abuse in one of three ways, one of which was to arrest the offender. When the researchers examined their data (police records for the persons in their experiment), they found that of those arrested for assaulting their spouse, only 13% repeated the offense, compared with a 26% recidivism rate for those who were separated from their spouse by the police but were not arrested. This pattern in the data, or empirical generalization, was consistent with the hypothesis that the researchers deduced from deterrence theory. The theory thus received support from the experiment (Exhibit 2.3).

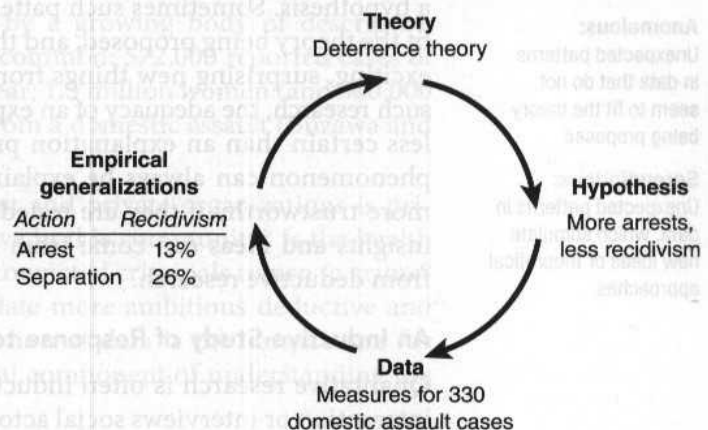
Inductive Research

In contrast to deductive research, inductive research begins with specific data, which are then used to develop (*induce*) a theory to account for the data. (Hint: When you start *in* the data, you are doing inductive research.)

One way to think of this process is in terms of the research circle. Rather than starting at the top of the circle with a theory, the inductive researcher starts at the bottom of the circle with data and then moves up to a theory. Some researchers committed to an inductive approach even resist formulating a research question before they begin to collect data. Their technique is to let the question emerge from the social situation itself (Brewer and Hunter 1989: 54–58). In the research for his book *Champions: The Making of Olympic Swimmers*, Dan Chambliss (1988) spent several years living and working with world-class competitive swimmers who were training for the Olympics. Chambliss entered the research with no definite hypotheses and certainly no developed theory about how athletes became successful, what their lives were like, or how they related to their coaches and teams. He simply wanted to understand who these people were, and he decided to report on whatever struck him as most interesting in his research.

As it turned out, what Chambliss learned was not how special these athletes were but actually how ordinary they were. Becoming an Olympic athlete was less about innate talent, special techniques, or inspired coaching than it was about actually paying attention to all the little things that make one perform better in one's sport. His theory was *induced* from what he learned in his studies (Chambliss 1988) while being immersed in the data.

Exhibit 2.3 /// The Research Circle: Minneapolis Domestic Violence Experiment



Research That Matters

The Sherman and Berk domestic violence study did not, however, end the debate about how best to respond to incidents. By the 1990s, the Charlotte-Mecklenburg (North Carolina) Police Department (CMPD) had been responding to reports of violence against intimate partners by arresting many of the suspects. Unfortunately, 6 months after the arrests, it appeared that suspects who had been arrested were just as likely to reoffend as were those who were simply advised to cool off. In 1995, the CMPD decided to try a different approach to domestic violence cases. CMPD developed a special domestic violence unit that took a comprehensive team approach

to investigating cases and assisting victims. Professors M. Lyn Exum, Jennifer L. Hartman, Paul C. Friday, and Vivian B. Lord, at the University of North Carolina in Charlotte, set out to see if this approach worked. They checked the arrest records of 891 domestic violence cases to see if suspects processed through the special unit were less likely to reoffend than were those who were processed with standard police practices. Exum and her colleagues found that 29.3% of the suspects processed by the domestic violence unit reoffended, compared with 36.9% of those processed by a standard police patrol unit. There was a little, but not much, difference.

Source: Adapted from Exum, M. Lyn, Jennifer L. Hartman, Paul C. Friday, and Vivian B. Lord. 2010. Policing domestic violence in the post-SARP era: The impact of a domestic violence police unit. *Crime & Delinquency* 20(10): 1–34.

Inductive reasoning:
The type of reasoning that moves from the specific to the general.

Anomalous:
Unexpected patterns in data that do not seem to fit the theory being proposed.

Serendipitous:
Unexpected patterns in data, which stimulate new ideas or theoretical approaches.

Research designed using an inductive approach, as in Chambliss's study, can result in new insights and provocative questions. **Inductive reasoning** also enters into deductive research when we find unexpected patterns in data collected for testing a hypothesis. Sometimes such patterns are **anomalous**, in that they don't seem to fit the theory being proposed, and they can be **serendipitous**, in that we may learn exciting, surprising new things from them. Even if we do learn inductively from such research, the adequacy of an explanation formulated after the fact is necessarily less certain than an explanation presented before the collection of data. Every phenomenon can always be explained in some way. Inductive explanations are more trustworthy if they are tested subsequently with deductive research. Great insights and ideas can come from inductive studies, but verifiable proof comes from deductive research.

An Inductive Study of Response to a Disaster

Qualitative research is often inductive: To begin, the researcher observes social interaction or interviews social actors in depth, and then develops an explanation for what has been found. The researchers often ask such questions as these: What is going on here? How do people interpret these experiences? Why do people do what they do? Rather than testing a hypothesis, the researchers try to make sense of some social phenomenon.

In 1972, for example, towns along the 17-mile Buffalo Creek hollow (a long, deep valley among mountains) in West Virginia were wiped out when a dam at the top of the hollow broke, sending 132 million gallons of water, mud, and garbage crashing down through the towns that bordered the creek. After the disaster, sociologist Kai Erikson went to the Buffalo Creek area and interviewed survivors. In the resulting book, *Everything in Its Path*, Erikson (1976) described the trauma suffered by those who survived the disaster. His explanation of their psychological destruction—an explanation that grew out of his interviews with the residents—was that people were traumatized not only by the violence of what had occurred but also by the “destruction of community” that ensued during the recovery efforts. Families were transplanted all over the area with no regard for placing them next to their former neighbors. Extended families were broken up in much the same way, as federal emergency housing authorities relocated people with little concern for whether they knew the people with whom they would be housed. Church congregations were scattered, lifelong friends were resettled miles apart, and entire neighborhoods simply vanished, both physically—that is, their houses were destroyed—and socially. Erikson's explanation grew out of his in-depth immersion in his data—the conversations he had with the people themselves.

Inductive explanations such as Erikson's feel authentic because we hear what people have to say in their own words and we see the social world as they see it. These explanations are often richer and more finely textured than are those in deductive research; however, they are probably based on fewer cases and drawn from a more limited area.

Descriptive Research: A Necessary Step

Both deductive and inductive research move halfway around the research circle, connecting theory with data. Descriptive research does not go that far, but it is still part of the research circle shown earlier in Exhibit 2.2. Descriptive research

starts with data and proceeds only to the stage of making empirical generalizations; it does not generate entire theories.

Valid description is actually critical in all research. The Minneapolis Domestic Violence Experiment was motivated partly by a growing body of descriptive research indicating that spouse abuse is very common: 572,000 reported cases of women victimized by a violent partner each year; 1.5 million women (and 500,000 men) requiring medical attention each year from a domestic assault (Buzawa and Buzawa 1996: 1-3).

Much important research for the government and private organizations is primarily descriptive: How many poor people live in this community? Is the health of the elderly improving? How frequently do convicted criminals return to crime? Description of social phenomena can stimulate more ambitious deductive and inductive research. Simply put, good description of data is the cornerstone for the scientific research process and an essential component of understanding the social world.

WHAT IS THE DESIGN?

Researchers usually start with a question, although some begin with a theory or a strategy. If you're very systematic, the *question* is related to a *theory*, and an appropriate *strategy* is chosen for the research. All of these, you will notice, are critical defining issues for the researcher. If your research question is trivial (How many shoes are in my closet?), or your theory sloppy (More shoes reflect better fashion sense), or your strategy inappropriate (I'll look at lots of shoes and see what I learn), the project is doomed from the start.

But let's say you've settled these first three elements of a sound research study. Now we must begin a more technical phase of the research: the design of a study. From this point on, we will be introducing a number of terms and definitions that may seem arcane or difficult. In every case, though, these terms will help you clarify your thinking. Like exact formulae in an algebra problem or precisely the right word in an essay, these technical terms help, or even require, scientists to be absolutely clear about what they are thinking—and to be precise in describing their work to other people.

An overall research strategy can be implemented through several different types of research design. One important distinction between research designs is whether data are collected at one point in time—a **cross-sectional research design**—or at two or more points in time—a **longitudinal research design**. Another important distinction is between research designs that focus on individuals—the **individual unit of analysis**—and those that focus on groups, or aggregates of individuals—the **group unit of analysis**.

Cross-Sectional Designs

In a cross-sectional design, all of the data are collected at one point in time. In effect, you take a *cross-section*—a slice that cuts across an entire population—and use that to see all the different parts, or sections, of that population. Imagine cutting out a slice of a tree trunk, from bark to core. In looking at this cross-section, one can see all the different parts, including the rings of the tree. In social research,

Cross-sectional research design:

A study in which data are collected at only one point in time.

Longitudinal research design:

A study in which data are collected that can be ordered in time; also defined as research in which data are collected at two or more points in time.

Individual unit of analysis:

A unit of analysis in which individuals are the source of data and the focus of conclusions.

Group unit of analysis:

A unit of analysis in which groups are the source of data and the focus of conclusions.

you might do a cross-sectional study of a college's student body, with a sample that includes freshmen through seniors. This "slice" of the population, taken at a single point in time, allows one to compare the different groups.

But cross-sectional studies, because they use data collected at only one time, suffer from a serious weakness: They don't directly measure the impact of time. For instance, you may see that seniors at your college write more clearly than do freshmen. You might conclude, then, that the difference is because of what transpired over time, that is, what they learned in college. But it might actually be because this year's seniors were recruited under a policy that favored better writers. In other words, the cross-sectional study doesn't distinguish if the seniors have learned a lot in college or if they were just better than this year's freshmen when they first enrolled.

Or let's say that in 2015, you conduct a study of the U.S. workforce and find that older workers make more money than younger workers do. You may conclude (erroneously) that as one gets older, one makes more money. But you didn't actually observe that happening because you didn't track actual people over time. It *may* be that the older generation (say, people born in 1965) have just enjoyed higher wages all along than have people born in 1985.

With a cross-sectional study, we can't be sure which explanation is correct, and that's a big weakness. Of course, we could ask workers what they made when they first started working, or we could ask college seniors what test scores they received when they were freshmen, but we are then injecting a *longitudinal* element into our cross-sectional research design. Because of the fallibility of memory and the incentives for distorting the past, taking such an approach is not a good way to study change over time.

Longitudinal Designs

In longitudinal research, data are collected over time. By measuring independent and dependent variables at each of several different times, the researcher can determine whether change in the independent variable actually precedes change in the dependent variable—that is, whether the hypothesized cause comes before the effect, as a true cause must. In a cross-sectional study, when the data are all collected at one time, you can't really show if the hypothesized cause occurs first; in longitudinal studies, though, you can see if a cause occurs and then, later in time, an effect occurs. So if possible to do, longitudinal research is always preferable.

But collecting data more than once takes time and work. Often researchers simply cannot, or are unwilling to, delay completion of a study for even 1 year to collect follow-up data. In student research projects, longitudinal research is typically not possible because you have to finish up the project quickly. Still, many research questions really should have a long follow-up period: What is the impact of job training on subsequent employment? How effective is a school-based program in improving parenting skills? Under what conditions do traumatic experiences in childhood result in later mental illness? The value of longitudinal data is great, so every effort should be made to develop longitudinal research designs whenever they are appropriate.

Three basic research designs are shown in Exhibit 2.4. The first is a simple *cross-sectional* design; it is not longitudinal.

Exhibit 2.4 /// Three Types of Research Designs

1. Cross-Sectional Design



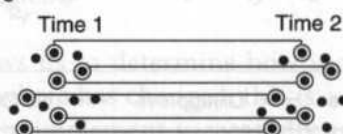
One sample drawn at one time (not longitudinal).

2. Trend (or "Repeated Cross-Sectional") Design



At least two samples, drawn at least two different times (longitudinal).

3. Panel Design



One sample, measured at least two different times (longitudinal).

The second is a cross-sectional study that is then *repeated* at least once; therefore, this approach is referred to as a *repeated cross-sectional* or a *trend* design because it can capture trends over time; it is longitudinal. The frequency of the follow-up measurements can vary, ranging from a simple before-and-after design with just one follow-up to studies in which various indicators are measured every month for many years. In such trend studies, members of the sample are rotated or completely replaced each time a measurement is done.

The third design, also longitudinal, is called a *panel* study. A panel study uses a single sample that is studied at multiple points across time; the same people, for instance, will be asked questions on multiple occasions, so researchers can learn how they change and develop as individuals.

Let's consider the longitudinal designs to see how they are done and what their strengths and weaknesses are.

Trend Designs

Trend (repeated cross-sectional) designs are conducted as follows:

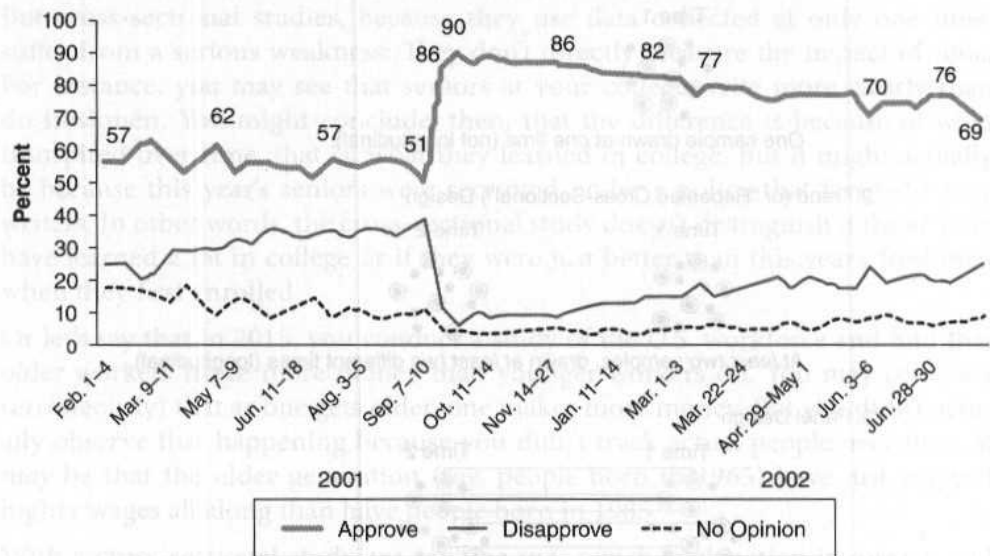
1. A sample is drawn from a population at Time 1, and data are collected from the sample.
2. As time passes, some people leave the population and others enter it.
3. At Time 2, a different sample is drawn from this population.

Trend (repeated cross-sectional) design:

A longitudinal study in which data are collected at two or more points in time from different samples of the same population.

The Gallup polls, begun in the 1930s, are a well-known example of trend studies. One Gallup poll, for instance, asks people how well they believe the U.S. president

Exhibit 2.5 /// George W. Bush Approval Ratings, Before and After Sept. 11, 2001: A Trend Study by the Gallup Organization



Source: Gallup Organization. 2002, August 20. Poll analyses, July 29, 2002. Bush job approval update.

is doing his job (Exhibit 2.5). Every so often, the Gallup organization takes a sample of the U.S. population (usually about 1,400 people) and asks them this question. Each time, Gallup researchers ask a different, though roughly demographically equivalent, group of people the question; they aren't talking to the same people every time. That is, they can see when support for presidents is high and when it is low, in general. This is a trend study. Exhibit 2.5 shows the dramatic increase in the public's approval rating of President George W. Bush following the September 11, 2001, World Trade Center attacks. In the entire history of Gallup polls, this is the single biggest approval increase ever recorded for an American president.

When the goal is to determine whether a population (not necessarily individuals) has changed over time, trend (or "repeated cross-sectional") designs are appropriate. Has support for gay marriage increased among Americans in the past 20 years? Are employers more likely to pay maternity benefits today than they were in the 1950s? Are college students today more involved in their communities than college students were 10 years ago? These questions concern changes in populations as a whole, not changes in individuals.

Panel Designs

When we need to know whether specific individuals in a population have changed, we must turn to a **panel design**. For their book *How College Works* (2014), Dan Chambliss and Chris Takacs selected a panel of 100 random students entering college in 2001. Each of those students was interviewed once a year for each of their 4 years in college; then they were interviewed every 2 years after graduation until 2010. The goal was to determine which experiences in their college career were valuable and which were a hindrance to their education. By

Panel design:
A longitudinal study in which data are collected from the same individuals—the panel—at two or more points in time.

following the same people over time, we can see how changes happen in the lives of individual students.

Panel designs allow clear identification of changes in the units (individuals, groups, or whatever) we are studying. Here is the process for conducting fixed-sample panel studies:

1. A sample (called a *panel*) is drawn from a population at Time 1, and data are collected from the sample (e.g., 100 freshmen are selected and interviewed).
2. As time passes, some panel members become unavailable for follow-up, and the population changes (some students transfer to other colleges or decline to continue participating).
3. At Time 2, data are collected (the remaining students are reinterviewed) from the same people (the panel) as at Time 1, except for those people who cannot be located.

A panel design allows us to determine how individuals change, as well as how the population as a whole has changed; this is a great advantage. However, panel designs are difficult to implement successfully and often are not even attempted, for two reasons:

1. *Expense and attrition*—It can be difficult and expensive to keep track of individuals over a long period, and inevitably the proportion of panel members who can be located for follow-up will decline over time. Panel studies often lose more than one quarter of their members through attrition (Miller 1991: 170).
2. *Subject fatigue*—Panel members may grow weary of repeated interviews and drop out of the study, or they may become so used to answering the standard questions in the survey that they start giving stock answers rather than actually thinking about their current feelings or actions (Campbell 1992).

Although quite difficult to do, panel studies can be scientifically valuable and intrinsically fascinating. In the British *Up* documentary film series, a group of 14 British 7-year-olds were filmed in 1964, for a movie titled *7 Up*. Every 7 years since then, the same people have been interviewed, for what has become one of the most extraordinary documentaries ever made. The latest movie is titled *56 Up*, and shows the current lives of the same people, now much older. Only one has dropped out completely. The series as a whole thus follows these people through their lives, and is immensely revealing of, for instance, the ways their social class has affected them.

Cohort Designs

Among other uses, longitudinal studies can be designed to track the results of either an event (such as the 9/11 bombings, or the 2008 economic crash) or the progress of a specific historical generation (e.g., people born in 1996). In these cases, the specific group of people being studied is known as a **cohort**, and the study is using a **cohort design**. If you were doing a trend study, for instance, the

Cohort:

Individuals or groups with a common starting point.

Cohort design:

A longitudinal study in which data are collected at two or more points in time from individuals in a cohort.

cohort would be the population from which you draw your series of samples. If you were doing a panel study, the cohort provides the population from which the panel itself is drawn. Examples of cohorts include the following:

- *Birth cohorts*—those who share a common period of birth—for example, “baby boomers” born after World War II, “millennials” who became adults around 2000, “digital natives” born since the Internet became pervasive, and so forth.
- *Seniority cohorts*—those who have worked at the same place for about 5 years, about 10 years, and so on.
- *Event cohort*—people who have shared an event, for instance, all the victims of Hurricane Sandy that hit the Northeast coast of the United States in 2012. Many panel studies are based on cohorts because the people selected by definition all start in the research at the same specific time in history; the researcher needs to be aware that their cohort status (when they are living) may affect the results.

We can see the value of longitudinal research using a cohort design in comparing two studies that estimated the impact of public and private schooling on high school students’ achievement test scores. In an initial cross-sectional (not longitudinal) study, James Coleman, Thomas Hoffer, and Sally Kilgore (1982) compared standardized achievement test scores of high school sophomores and seniors in public, Catholic, and other private schools. The researchers found that test scores were higher in the private (including Catholic) high schools than in the public high schools.

But was this difference a causal effect of private schooling? Perhaps the parents of higher-performing children were choosing to send them to private schools rather than to public ones. So Coleman and Hoffer (1987) went back to the high schools and studied the test scores of the former sophomores 2 years later, when they were seniors; in other words, the researchers used a panel (longitudinal) design. This time, they found that the verbal and math achievement test scores of the Catholic school students had increased more over the 2 years than the scores of the public school students had. Irrespective of students’ initial achievement test scores, the Catholic schools seemed to “do more” for their students than did the public schools. The researchers’ causal conclusion rested on much stronger ground because they used a longitudinal panel design.

Units and Levels of Analysis

Units of analysis:

The entities being studied, whose behavior is to be understood.

Units of analysis are the things you are studying, whose behavior you want to understand. Often these are individual people (e.g., why do certain students work harder?), but they can also be, for instance, families, groups, colleges, governments, or nations. All of these could be units of analysis for your research. Sociologist Erving Goffman, writing about face-to-face interaction, became famous partly because he realized that the interaction itself—not just the people in it—could be a unit of analysis. Goffman argued that interactions as such worked in certain ways, apart from the individuals who happened to be joining them: “Not, then, men and their moments. Rather, moments and their men” (Goffman 1967: 3). Researchers must always be clear about what is the level of social life they are studying: What

are their units of analysis? The units of analysis are the entities you are studying and trying to learn about.

As the examples suggest, units exist at different *levels* of collectivity, from the most micro (small) to the most macro (large). Individual people are easily seen and talked to, and you can learn about them quite directly. A university, however, although you can certainly visit it and walk around it, is harder to visualize, and data regarding it may take longer to gather. Finally, a nation is not really a “thing” at all and can never be seen by human eyes; understanding such a unit may require many years of study. People, universities, and nations exist at different *levels* of social reality. And as probably already known, groups don’t act like individuals do.

Sometimes researchers confuse levels of analysis, mistakenly using data from one level to draw conclusions about a different level. Even the best social scientists fall into this trap. In Émile Durkheim’s classic (1951) study of suicide, for example, nationwide suicide rates were compared for Catholic and Protestant countries (in an early stage of his research). The data on suicide were collected for individual people, and religion was tallied for individuals as well. Then Durkheim used aggregated numbers to characterize entire countries as being high or low suicide countries and as Protestant (England, Germany, Norway) or Catholic (Italy, France, Spain) countries. He found that Catholic countries had lower rates of suicide than Protestant countries had. His accurate finding was about countries, then, not about people; the unit of analysis was the country, and he ranked countries by their suicide rates. Yes, the data were collected from individuals and were about individuals, but it had been combined (aggregated) to describe entire nations. Thus, Durkheim’s units of analysis were countries. So far, so good.

But Durkheim then made his big mistake. He used his findings from one level of analysis to make statements about units at a different level. He used country data to draw conclusions about individuals, claiming that Catholic individuals were less likely than were Protestant individuals to commit suicide. Much of his later discussion in *Suicide* (1951) was about why Catholic individuals would be less likely to kill themselves. Perhaps they are, but we can’t be sure based on aggregate data. It could be that Protestant individuals were more likely to kill themselves in Durkheim’s time when they lived in areas with high numbers of Catholics.

Confusions about levels of analysis can take several forms (Lieberson 1985). Durkheim’s mistake was to use findings from a “higher” level (countries) to draw conclusions about a “lower” level (individuals). This is called the **ecological fallacy** because the *ecology*—the broader surrounding setting, in this case a country—is mistakenly believed to straightforwardly parallel how individuals will act as well. The ecological fallacy occurs when group-level data are used to draw conclusions about individual-level processes. It’s a mistake, and a common one.

Ecological fallacy:
An error in reasoning in which conclusions about individual-level processes are drawn from group-level data.

Try to spot the ecological fallacy in each of the following deductions. The first half of each sentence is true, but the second half doesn’t logically follow from the first:

- Richer countries have higher rates of heart disease; therefore, richer people have higher rates of heart disease.
- Florida counties with the largest number of black residents have the highest rates of Ku Klux Klan membership; therefore, blacks join the Klan more than whites.

- In the 2012 presidential election, Republicans won the House of Representatives, but Democrats held onto the Senate, and President Obama was reelected; therefore, Americans want a divided government.

In each case, a group-level finding from data is used to draw (erroneous) conclusions about individuals. In rich countries, yes, there is more heart disease, but actually, it's among the poor individuals within those countries. Florida counties with more black people attract more white individuals to the Klan. And although the United States (as a whole) was certainly divided in the 2012 election, just as certainly many individual Americans, both Republican and Democratic, had no ambivalence whatsoever about who were their favorite candidates. *America* as a whole may "want a divided government," but relatively few *Americans* do.

A researcher who draws such hasty conclusions about individual-level processes from group-level data is committing an ecological fallacy. In August 2006, the *American Sociological Review* published a fierce exchange in which Mitchell Duneier, a well-known field researcher from Princeton University, attacked a very popular book, *Heat Wave*, by Eric Klinenberg. *Heat Wave* vividly described how hundreds of poor people in Chicago died during a heat wave in July 1995. Klinenberg argued that the deaths were the result of deteriorating community conditions—for instance, that vulnerable old people, afraid to go outside and possibly be attacked or mugged, remained indoors despite literally killing temperatures in their homes. Although it was clear that community conditions mattered, Duneier (2006) claimed that Klinenberg lacked any data on individual deaths to show that this is what happened. Duneier said that although (1) certain features prevailed in the stricken communities and (2) lots of people died, that did not mean that it was those conditions themselves that led to individual deaths. To show that, Klinenberg would need evidence about the cause of death for each person, as an individual. Klinenberg (2006) disagreed, strongly.

So, conclusions about processes at the individual level must be based on individual-level data; conclusions about group-level processes must be based on data collected about groups (Exhibit 2.6.)

We don't want to leave you with the belief that conclusions about individual processes based on group-level data are *necessarily* wrong. We just don't know for sure. Suppose, for example, that we find that communities with higher average incomes have lower crime rates. Perhaps something about affluence improves community life such that crime is reduced; that's possible. Or, it may be that the only thing special about these communities is that they have more individuals with higher incomes, who tend to commit fewer crimes. Even though we collected data at the group level and analyzed them at the group level, they may reflect a causal process at the individual level (Sampson and Lauritsen 1994: 80–83). The ecological fallacy just reminds us that we can't *know* about individuals without having individual-level information.

Confusion between levels of analysis also occurs in the other direction, when data from the individual level are used to draw conclusions about group behavior. For instance, you may know the personal preferences of everyone on a hiring committee, so you try to predict whom the committee will decide to hire, but you could easily be wrong. Or you may know two good individuals who are getting married, so you think that the marriage (the higher-level unit) will be good, too. But often,

Exhibit 2.6 /// Levels of Analysis. Data From One Level of Analysis Should Lead to Conclusions Only About That Level of Analysis.

INCORRECT				
Level of Analysis	Data Findings		(Incorrect) Conclusion	Level of Analysis
NATION	Protestant countries have high suicide rates		New York State votes Republican	NATION
	Rich countries have high rates of heart disease			
GROUP	Most counties in New York State vote Republican		Platoons with high promotion rates have high morale	GROUP
INDIVIDUAL	Individual soldiers who get promoted have high morale		Individual Protestants are more likely to commit suicide	INDIVIDUAL
			Rich people are more likely to have heart disease	
Downslope line (\) indicates ecological fallacy; upslope line (/) indicates reductionism.				
CORRECT				
Level of Analysis	Data Findings		Conclusion	Level of Analysis
NATIONS	(Data about nations)	→	(Conclusion about nations)	NATIONS
STATES	(Data about states)	→	(Conclusion about states)	STATES
COUNTIES	(Data about counties)	→	(Conclusion about counties)	COUNTIES
ORGANIZATIONS	(Data about organizations)	→	(Conclusion about organizations)	ORGANIZATIONS
GROUPS	(Data about groups)	→	(Conclusion about groups)	GROUPS
INDIVIDUALS	(Data about individuals)	→	(Conclusion about individuals)	INDIVIDUALS

such predictions are wrong because groups as units don't work like individuals. Nations often go to war even when most of their people (individually) don't want to. Adam Smith, in the 1700s, famously pointed out that millions of people (individuals) acting selfishly could in fact produce an economy (a group) that acted selflessly, helping almost everyone. You can't predict higher-level processes or outcomes from lower-level ones. You can't, in short, always reduce group behavior to individual behavior added up; doing so is called the **reductionist fallacy**, or **reductionism** (because it *reduces* group behavior to that of individuals), and it's basically the reverse of the ecological fallacy.

Both involve confusion of levels of analysis.

Reductionist fallacy (reductionism):

An error in reasoning that occurs when incorrect conclusions about group-level processes are based on individual-level data:



Careers and Research

Kristin M. Curtis, Senior Research Program Coordinator



Kristin M. Curtis

Kristin Curtis graduated with a master's degree in criminal justice from Rutgers University in Camden in 2010. As a graduate student, she worked on a nationwide research project exam-

ining policymaker and practitioner perspectives on sex offender laws, and this experience convinced her that pursuing a career in research was the best fit for her interests and talents. She secured a position as a graduate project assistant at a research institute where she worked on statewide prisoner reentry studies. Curtis quickly moved up the ranks and, in the process, has worked on myriad criminal justice projects. Her research assignments require varied methodological approaches, including interviews, focus groups, surveys, network analyses, regression models, and geographic information systems (GISs).

One feature of her work that Curtis truly values is the fact that she can participate in other areas of study outside the criminal justice realm. For instance, she has worked on projects that examine the impact of social service organization collaboration on child well-being,

financial stability of families, and relationships between children and their caregivers. These projects involve the evaluation of collaborations among social service organizations in multiple counties and employ both qualitative and quantitative research methods. After 8 years, Curtis still enjoys her position as each day presents new challenges and different tasks, including data collection and analysis, finalizing reports, writing grant proposals for potential new projects, and supervising graduate students.

Curtis has advice for students interested in careers conducting research or using research results:

Locate faculty who engage in research in your areas of interest. Even if you are unsure what your primary research areas are, working on a research project allows you to gain exposure to different research methodologies and techniques (i.e., quantitative and qualitative). You might find you enjoy research and pick up conference presentations and academic publications along the way. Remember, college is an opportunity to explore the different career choices in the world, so take advantage of this.

CONCLUSION

Social researchers can find many questions to study, but not all questions are equally worthy. The ones that warrant the expense and effort of social research are feasible, socially important, and scientifically relevant.

Selecting a worthy research question does not guarantee a worthwhile research project. The simplicity of the research circle presented in this chapter belies the complexity of the social research process. In the following chapters, we will focus on particular aspects of that process. Chapter 4 examines the interrelated processes of conceptualization and measurement, arguably the most important parts of research. Measurement validity is the foundation for the other two aspects of validity, which are discussed in Chapters 5 and 6. Chapter 5 reviews the meaning

of generalizability and the sampling strategies that help us to achieve this goal. Chapter 6 introduces the third aspect of validity—causal validity—and illustrates different methods for achieving causal validity and explains basic experimental data collection. Chapters 7 and 9 introduce approaches to data collection—surveys and qualitative research—that help us, in different ways, to achieve validity.

You are now forewarned about the difficulties that all scientists, but social scientists in particular, face in their work. We hope that you will return often to this chapter as you read the subsequent chapters, when you criticize the research literature, and when you design your own research projects. To be conscientious, thoughtful, and responsible—this is the mandate of every social scientist. If you formulate a feasible research problem, ask the right questions in advance, try to adhere to the research guidelines, and steer clear of the most common difficulties, you will be well along the road to fulfilling this mandate.

/// KEY TERMS

Anomalous 28	Hypothesis 25	Research circle 24
Cohort 33	Independent variable 26	Serendipitous 28
Cohort design 33	Individual unit of analysis 29	Social research question 21
Cross-sectional research design 29	Inductive reasoning 28	Theory 22
Deductive research 24	Inductive research 24	Trend (repeated cross-sectional) design 31
Dependent variable 26	Longitudinal research design 29	Units of analysis 34
Direction of association 26	Panel design 32	Variable 25
Ecological fallacy 35	Reductionist fallacy (reductionism) 37	
Group unit of analysis 29		

/// HIGHLIGHTS

- Research questions should be feasible (within the time and resources available), socially important, and scientifically relevant.
- Building social theory is a major objective of social science research. Investigate relevant theories before starting social research projects, and draw out the theoretical implications of research findings.
- The type of reasoning in most research can be described as primarily deductive or primarily inductive. Research based on deductive reasoning proceeds from general ideas, deduces specific expectations from these ideas, and then tests the ideas with empirical data. Research based on inductive reasoning begins with (*in*) specific data and then develops (*induces*) general ideas or theories to explain patterns in the data.
- It may be possible to explain unanticipated research findings after the fact, but such explanations have less credibility than those that have been tested with data collected for the purpose of the study.
- The scientific process can be represented as circular, with connections from theory, to hypotheses, to data, and to empirical generalizations. Research investigations may begin at different points along the research circle and traverse different portions of it. Deductive research begins at the point of theory; inductive research begins with data but ends with theory.