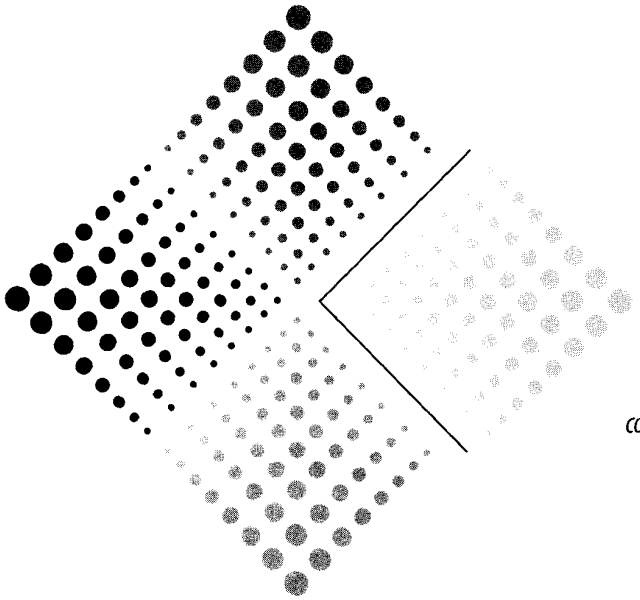
CHAPTER 1



Human Inquiry and Science

Holographic Overview

All of us try to understand and predict the social world. Science—and social research in particular—are designed to avoid the common pitfalls of ordinary human inquiry. ■

Introduction

This book is about knowing things—not so much *what* we know as *how* we know it. Let's start by examining a few things you probably know already.

You know the world is round. You probably also know it's cold on the dark side of the moon, and you know people speak Chinese in China. You know that vitamin C prevents colds and that unprotected sex can result in AIDS.

How do you know? Unless you've been to the dark side of the moon lately or done experimental research on the virtues of vitamin C, you know these things because somebody told them to you, and you believed what you were told. You may have read in *National Geographic* that people speak Chinese in China, and that made sense to you, so you didn't question it. Perhaps your physics or astronomy instructor told you it was cold on the dark side of the moon, or maybe you read it in *Newsweek*.

Some of the things you know seem absolutely obvious to you. If someone asked you how you know the world is round, you'd probably say, "Everybody knows that." There are a lot of things everybody knows. Of course, at one time, everyone "knew" the world was flat.

Most of what you and I know is a matter of agreement and belief. Little of it is based on personal experience and discovery. A big part of growing up in any society, in fact, is the process of learning to accept what everybody around us "knows" is so. If you don't know those same things, you can't really be a part of the group. If you were to question seriously whether the world is really round, you'd quickly find yourself set apart from other people. You might be sent to live in a hospital with other people who question things like that.

Although it's important to realize that most of what we know is a matter of believing what we've been told, there's nothing wrong with us in that respect. It's simply the way human societies are structured, and it is quite a useful quality. The basis of knowledge is agreement. Because we can't learn all we need to know by means of personal experience and discovery alone, things are set up so we can simply believe what others tell us. We know some things through tradition, some things from "experts."

There are other ways of knowing things, however. In contrast to knowing things through agreement, we can know them through direct experience—through observation. If you dive into a glacial stream flowing through the Canadian Rockies, you don't need anyone to tell you it's cold; you notice it all by yourself. The first time you stepped on a thorn, you knew it hurt before anyone told you.

When our experience conflicts with what everyone else knows, though, there's a good chance we'll surrender our experience in favor of the agreement.

Let's take an example. Imagine you've come to a party at my house. It's a high-class affair, and the drinks and food are excellent. In particular, you are taken by one of the appetizers I bring around on a tray: a breaded, deep-fried appetizer that's especially zesty. You have a couple—they're so delicious! You have more. Soon you are subtly moving around the room to be wherever I am when I arrive with a tray of these nibblies.

Finally, you can't contain yourself any more. "What are they?" you ask. "How can I get the recipe?" And I let you in on the secret: "You've been eating breaded, deep-fried worms!" Your response is dramatic: Your stomach rebels, and you stifle the urge to throw up all over the living-room rug. Awful! What a terrible thing to serve guests!

The point of the story is that both of your feelings about the appetizer were quite real. Your initial liking for them, based on your own direct experience, was certainly real. But so was the feeling of disgust you had when you found out that you'd been eating worms. It should be evident, however, that this feeling of disgust was strictly a product of the agreements you have with those around you that worms aren't fit to eat. That's an agreement you entered into the first time your parents found you sitting in a pile of dirt with half of a wriggling worm dangling from your lips. When they pried your mouth open and reached down your throat in search of the other half of the worm, you learned that worms are not acceptable food in our society.

Aside from these agreements, what's wrong with worms? They are probably high in protein and low in calories. Bite-sized and easily packaged, they are a distributor's dream. They are also a delicacy for some people who live in societies that lack our agreement that worms are disgusting. Some people might love the worms but be turned off by the deep-fried breading.

Here's a question you might consider: "Are worms 'really' good or 'really' bad to eat?" And here's a more interesting question: "How could you know which was really so?" This book is about answering the second kind of question.

The rest of this chapter looks at how we know what is real. We'll begin by examining inquiry as a natural human activity, something we all have engaged in every day of our lives. We'll look at the source of everyday knowledge and at some kinds of errors we make in normal inquiry. We'll then examine what makes science—in particular, social science—different. After considering some of the underlying ideas of social research, we'll conclude with an initial consideration of issues in social research.

Looking for Reality

Reality is a tricky business. You probably already suspect that some of the things you "know" may not be true, but how can you really know what's real? People have grappled with this question for thousands of years.

One answer that has arisen out of that grappling is science, which offers an approach to both agreement reality and experiential reality. Scientists have certain criteria that must be met before they will accept the reality of something they haven't personally experienced. In general, a scientific assertion must have both logical and empirical support: It must make sense, and it must not contradict actual observation. Why do earthbound scientists accept the assertion that it's cold on the dark side of the moon? First, it makes sense, because the moon's surface heat comes from the sun's rays, and the dark side of the moon is dark because it's turned away from the sun. Second, scientific measurements made on the moon's dark side confirm this logical expectation. So, scientists accept the reality of things they don't personally experience—they accept an agreement reality—but they have special standards for doing so.

More to the point of this book, however, science offers a special approach to the discovery of reality through personal experience. In other words, it offers a special approach to the business of inquiry. *Epistemology* is the science of knowing; *methodology* (a subfield of epistemology) might be called the science of finding out. This book is an examination and presentation of social science methodology, or how social scientists find out about human social life.

Why do we need social science to discover the reality of social life? To find out, let's first consider what happens in ordinary, nonscientific inquiry.

Ordinary Human Inquiry

Practically all people, and many other animals as well, exhibit a desire to predict their future circumstances. Humans seem predisposed to undertake this task using causal and probabilistic reasoning. First, we generally recognize that future circumstances are somehow caused or conditioned by present ones. We learn that getting an education will affect how much money we earn later in life and that swimming beyond the reef may bring an unhappy encounter with a shark. Sharks, on the other hand—whether or not they reason the matter through—may learn that hanging around the reef often brings a happy encounter with unhappy swimmers.

Second, people, and seemingly other animals, also learn that such patterns of cause and effect are probabilistic in nature. That is, the effects occur more often when the causes occur than when the causes are absent—but not always. Thus, students learn that studying hard produces good grades in most instances, but not every time. We recognize the danger of swimming beyond the reef without believing that every such swim will be fatal. As we'll see throughout the book, science makes these concepts of causality and probability more explicit and provides techniques for dealing with them

more rigorously than does casual human inquiry. It sharpens the skills we already have by making us more conscious, rigorous, and explicit in our inquiries.

In looking at ordinary human inquiry, we need to distinguish between prediction and understanding. Often, we can make predictions without understanding—perhaps you can predict rain when your trick knee aches. And often, even if we don't understand why, we are willing to act on the basis of a demonstrated predictive ability. A racetrack buff who discovers that the third-ranked horse in the third race of the day always seems to win will probably keep betting without knowing, or caring, why it works out that way. Of course, the drawback in predicting without understanding will be powerfully evident when one of the other horses wins and our buff loses a week's pay.

Whatever the primitive drives or instincts that motivate human beings and other animals, satisfying them depends heavily on the ability to predict future circumstances. For people, however, the attempt to predict is often placed in a context of knowledge and understanding. If you can understand why things are related to one another, why certain regular patterns occur, you can predict better than if you simply observe and remember those patterns. Thus, human inquiry aims at answering both "what" and "why" questions, and we pursue these goals by observing and figuring out.

As I suggested earlier in this chapter, our attempts to learn about the world are only partly linked to direct, personal inquiry or experience. Another, much larger, part comes from the agreed-upon knowledge that others give us, those things "everyone knows." This agreement reality both assists and hinders our attempts to find out for ourselves. To see how, consider two important sources of our secondhand knowledge—tradition and authority.

Tradition

Each of us inherits a culture made up, in part, of firmly accepted knowledge about the workings of the world. We may learn from others that planting corn in the spring will garner the greatest assistance from the gods, that eating too much candy will decay our teeth, that the circumference of a circle is approximately twenty-two sevenths of its diameter, or that masturbation will blind us. We may test a few of these "truths" on our own, but we simply accept the great majority of them. These are things that "everybody knows."

Tradition, in this sense of the term, offers some clear advantages to human inquiry. By accepting what everybody knows, we are spared the overwhelming task of starting from scratch in our search for regularities and understanding. Knowledge is cumulative, and an inherited body of information and understanding is the jumping-off point for the development of more knowledge. We often speak of "standing on the shoulders of giants," that is, of previous generations.

At the same time, tradition may hinder human inquiry. If we seek a fresh understanding of something everybody already understands and has always understood, we may be marked as fools for our efforts. More to the point, however, it rarely occurs to most of us to seek a different understanding of something we all "know" to be true.

Authority

Despite the power of tradition, new knowledge appears every day. Quite aside from our own personal inquiries, we benefit throughout our lives from new discoveries and understandings produced by others. Often, acceptance of these new acquisitions depends on the status of the discoverer. You're more likely to believe the epidemiologist who declares that the common cold can be transmitted through kissing, for example, than to believe your uncle Pete.

Like tradition, authority can both assist and hinder human inquiry. We do well to trust in the judgment of the person who has special training, expertise, and credentials in a given matter, especially in the face of controversy. At the same time, inquiry can be greatly hindered by the legitimate authorities who err within their own province. Biologists, after all, make their mistakes in the field of biology. Moreover, biological knowledge changes over time.

Inquiry is also hindered when we depend on the authority of experts speaking outside their realm of expertise. For example, consider the political or religious leader with no medical or biochemical expertise who declares that marijuana can fry your brain. The advertising industry plays heavily on this misuse of authority by, for example, having popular athletes discuss the nutritional value of breakfast cereals or having movie actors evaluate the performance of automobiles.

Both tradition and authority, then, are double-edged swords in the search for knowledge about the world. Simply put, they provide us with a starting point for our own inquiry, but they can lead us to start at the wrong point and push us off in the wrong direction.

Errors in Inquiry, and Some Solutions

Quite aside from the potential dangers of tradition and authority, we often stumble and fall when we set out to learn for ourselves. Let's look at some of the common errors we make in our casual inquiries and at the ways science guards against those errors.

Inaccurate Observations

Quite frequently, we make mistakes in our observations. For example, what was your methodology instructor wearing on the first day of class? If you have to guess, it's because most of our daily observations are casual and semiconscious. That's why we often disagree about what really happened.

In contrast to casual human inquiry, scientific observation is a conscious activity. Simply making observation more deliberate helps reduce error. If you had to guess what your instructor was wearing on the first day of class, you'd probably make a mistake. If you had gone to the first class with a conscious plan to observe and record what your instructor was wearing, however, you'd be far more likely to be accurate.

In many cases, both simple and complex measurement devices help guard against inaccurate observations. Moreover, they add a degree of precision well beyond the capacity of the unassisted human senses. Suppose, for example, that you had taken color photographs of your instructor that day.

Overgeneralization

When we look for patterns among the specific things we observe around us, we often assume that a few similar events are evidence of a general pattern. That is, we overgeneralize on the basis of limited observations. (Think back to our now-broke racetrack buff.)

Probably the tendency to overgeneralize is greatest when the pressure to arrive at a general understanding is high. Yet it also occurs without such pressure. Whenever overgeneralization does occur, it can misdirect or impede inquiry.

Imagine you are a reporter covering an animal-rights demonstration. You have orders to turn in your story in just two hours, and you need to know why people are demonstrating. Rushing to the scene, you start interviewing them, asking for their reasons. If the first three demonstrators you interview give you essentially the same reason, you may simply assume that the other 3,000 are also there for that reason. Unfortunately, when your story appears, your editor gets scores of letters from protesters who were there for an entirely different reason.

Scientists guard against overgeneralization by committing themselves in advance to a sufficiently large and representative sample of observations. Another safeguard is provided by the **replication** of inquiry. Basically, replication means repeating a study and checking to see whether the same results are produced each time. Then, as a further test, the study may be repeated again under slightly varied conditions.

Selective Observation

One danger of overgeneralization is that it may lead to selective observation. Once we have concluded that a particular pattern exists and have developed a general understanding of why it exists, we tend to focus on future events and situations that fit the pattern, and we tend to ignore those that don't. Racial and ethnic prejudices depend heavily on selective observation for their persistence.

Sometimes a research design will specify in advance the number and kind of observations to be made, as a basis for reaching a conclusion. If we wanted to learn whether women were more likely than men to support freedom to choose an abortion, we'd commit ourselves to making a specified number of observations on that question in a research project. We might select a thousand carefully chosen people to be interviewed on the issue. Alternately, when making direct observations of an event, such as attending the animal-rights demonstration, social researchers make a special effort to find "deviant cases"—precisely those who do not fit into the general pattern. Concluding that one youth became delinquent largely because of a lack of positive adult role models draws attention to the part role models play in keeping most youths on the straight and narrow.

Illogical Reasoning

There are other ways in which we often deal with observations that contradict our understanding of the way things are in daily life. Surely one of the most remarkable creations of the human mind is "the exception that proves the rule." That idea doesn't make any sense at all. An exception can draw attention to a rule or to a supposed rule, but in no system of logic can it prove the rule it contradicts. Even so, we often use this pithy saying to brush away contradictions with a simple stroke of illogic.

What statisticians have called the *gambler's fallacy* is another illustration of illogic in day-to-day reasoning. Often we assume that a consistent run of either good or bad luck foreshadows its opposite. An evening of bad luck at poker may kindle the belief that a winning hand is just around the corner. Many a poker player has stayed in a game much too long because of that mistaken belief. Conversely, an extended period of good weather may lead you to worry that it is certain to rain on the weekend picnic.

Although all of us sometimes fall into embarrassingly illogical reasoning, scientists try to avoid this pitfall by using systems of logic consciously and explicitly. We'll examine the logic of science in more depth in Chapter 2. For now, it's sufficient to note that logical reasoning is a conscious activity for scientists and that other scientists are always around to keep them honest.

Science, then, attempts to protect its inquiries from the common pitfalls in ordinary inquiry. Accurately observing and understanding reality is not an obvious or trivial matter. Indeed, it's more complicated than have I suggested.

What's Really Real?

Philosophers sometimes use the phrase "naive realism" to describe the way most of us operate in our daily lives. When you sit at a table to write, you probably don't spend a lot of time thinking about whether the table is really made up of atoms, which in turn are mostly empty space. When you step into the street and see a city bus hurtling down on you, it's not the best time to reflect on methods for testing whether the bus really exists. We all live with a view that what's real is pretty obvious—and that view usually gets us through the day.

I don't want this book to interfere with your ability to deal with everyday life. I hope, however, that the preceding discussions have demonstrated that the nature of "reality" is perhaps more complex than we tend to assume in our everyday functioning. Here are three views on reality that will provide a philosophical backdrop for the discussions of science to follow. They are sometimes called *premodern, modern,* and *postmodern* views of reality (W. Anderson 1990).

The Premodern View

This view of reality has guided most of human history. Our early ancestors all assumed that they saw things as they really were. In fact, this assumption was so fundamental that they didn't even see it as an assumption. No cavemom said to her cavekid, "Our tribe makes an assumption that evil spirits reside in the Old Twisted Tree." No, she said, "STAY OUT OF THAT TREE OR YOU'LL TURN INTO A TOAD!"

As humans evolved and became aware of their diversity, they came to recognize that others did not always share their views of things. Thus, they may

have discovered that another tribe didn't buy the wicked tree thing; in fact, the second tribe felt the spirits in the tree were holy and beneficial. The discovery of this diversity led members of the first tribe to conclude that "some tribes I could name are pretty stupid." For them, the tree was still wicked, and they expected that some misguided people would soon be moving to Toad City.

The Modern View

What philosophers call the *modern* view accepts such diversity as legitimate, a philosophical "different strokes for different folks." As a modern thinker, you would say, "I regard the spirits in the tree as evil, but I know others regard them as good. Neither of us is right or wrong. There are simply spirits in the tree. They are neither good nor evil, but different people have different ideas about them."

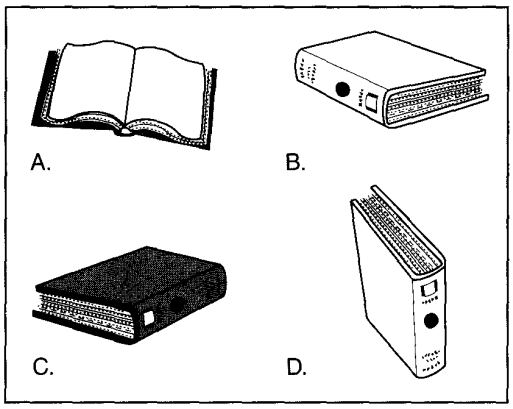
It's easy for many of us to adopt the modern view. Some might regard a dandelion as a beautiful flower while others see only an annoying weed. To the premoderns, a dandelion has to be either one or the other. If you think it is a weed, it is really a weed, though you may admit that some people have a warped sense of beauty. In the modern view, a dandelion is simply a dandelion. It is a plant with yellow petals and green leaves. The concepts "beautiful flower" and "annoying weed" are subjective points of view imposed on the plant by different people. Neither is a quality of the plant itself, just as "good" and "evil" were concepts imposed on the spirits in the tree.

The Postmodern View

Increasingly, philosophers speak of a *postmodern* view of reality. In this view, the spirits don't exist. Neither does the dandelion. All that's "real" are the images we get through our points of view. Put differently, there's nothing out there, it's all in here. As Gertrude Stein said of the city of Oakland, "There's no there, there."

No matter how bizarre the postmodern view may seem to you on first reflection, it has a certain ironic inevitability. Take a moment to notice the book you are reading; notice specifically what it looks like. Since you are reading these words, it probably looks something like Figure 1-1A.

FIGURE 1-1
A Book



But does Figure 1-1A represent the way your book "really" looks? Or does it merely represent what the book looks like from your current point of view? Surely, Figures 1-1B, C, and D are equally valid representations. But these views of the book are so different from one another. Which is the "reality"?

As this example illustrates, there is no answer to the question, "What does the book really look like?" All we can offer is the different ways it looks from different points of view. Thus, according to the postmodern view, there is no "book," only various images of it from different points of view. And all the different images are equally "true."

Now let's apply this logic to a social situation. Imagine a husband and wife arguing. When she looks over at her quarreling husband, Figure 1-2 is what the wife sees. Take a minute to imagine what you would feel and think if you were the woman in this drawing. How would you explain later to your best friend what had happened? What solutions to the conflict would seem appropriate if you were this woman?

Of course, what the woman's husband sees is another matter altogether, as shown in Figure 1-3. Take a minute to imagine experiencing the situation from his point of view. What thoughts and feelings would you have? How would you tell your

FIGURE 1-2
Wife's Point of View

best friend what had happened? What solutions would seem appropriate for resolving the conflict?

Now consider a third point of view. Suppose you are an outside observer, watching this interaction between a wife and husband. What would it look like to you now? Unfortunately, we can't easily portray the third point of view without knowing something about the personal feelings, beliefs, past experiences, and so forth that you would bring to your task as "outside" observer. (Though I call you an outside observer, you are, of course, observing from inside your own mental system.)

To take an extreme example, if you were a confirmed male chauvinist, you'd probably see the fight pretty much the same way that the husband saw it. On the other hand, if you were committed to the view that men are generally unreasonable bums, you'd see things the way the wife saw them in the earlier picture.

But imagine that instead you see two unreasonable people quarreling irrationally with each another. Would you see them both as irresponsible jerks, equally responsible for the conflict? Or would you see them as two people facing a difficult human situation, each doing the best he or she can to resolve it? Imagine feeling compassion for them and noticing how each of them attempts to end the hostility, even though the gravity of the problem keeps them fighting.

Notice how different these several views are. Which is a "true" picture of what is happening between the wife and the husband? You win the prize if you notice that the personal viewpoint you bring to the observational task will again color your perception of what is happening.

The postmodern view represents a critical dilemma for scientists. While their task is to observe and understand what is "really" happening, they are all human and, as such, bring along personal orientations that will color what they observe and how they explain it. There is ultimately no way people can totally step outside their humanness to

FIGURE 1-3
Husband's Point of View

see and understand the world as it "really" is—that is, independently of all human viewpoints.

Whereas the modern view acknowledges the inevitability of human subjectivity, the postmodern view suggests there is actually no "objective" reality to be observed in the first place. There are only our several subjective views.

You may want to ponder these three views of reality on your own for awhile. We'll return to them in Chapter 2 when we focus on more specific scientific paradigms. Ultimately, two points will emerge. First, established scientific procedures sometimes allow us to deal effectively with this dilemma—that is, we can study people and help them through their difficulties without being able to view "reality" directly. Second, different philosophical stances suggest a powerful range of possibilities for structuring our research.

Let's turn now from general philosophical ideas to the foundations of social scientific approaches to understanding in particular. A consideration of these underpinnings of social research will prepare the way for our exploration of specific research techniques.

The Foundations of Social Science

Science is sometimes characterized as logico-empirical. This ungainly term carries an important message: As we noted earlier, the two pillars of science are logic and observation. That is, a scientific understanding of the world must both make sense and correspond to what we observe. Both elements are essential to science and relate to the three major aspects of social scientific enterprise: theory, data collection, and data analysis.

To oversimplify just a bit, scientific **theory** deals with the logical aspect of science, whereas data col-

lection deals with the observational aspect. Data analysis looks for patterns in observations and, where appropriate, compares what is logically expected with what is actually observed. Although this book is primarily about data collection and data analysis—that is, how to conduct social research—the rest of Part 1 is devoted to the theoretical context of research. Parts 2 and 3 then focus on data collection, and Part 4 offers an introduction to the analysis of data.

Underlying the concepts presented in the rest of the book are some fundamental ideas that distinguish social science—theory, data collection, and analysis—from other ways of looking at social phenomena. Let's consider these ideas.

Theory, Not Philosophy or Belief

Today, social theory has to do with what is, not with what should be. For many centuries, however, social theory did not distinguish between these two orientations. Social philosophers liberally mixed their observations of what happened around them, their speculations about why, and their ideas about how things ought to be. Although modern social researchers may do the same from time to time, as scientists they focus on how things actually are and why.

This means that scientific theory—and, more broadly, science itself—cannot settle debates about values. Science cannot determine whether capitalism is better or worse than socialism. What it can do is determine how these systems perform in terms of some set of agreed-upon criteria. For example, we could determine scientifically whether capitalism or socialism most supports human dignity and freedom only if we first agreed on some measurable definitions of dignity and freedom. Our conclusions would then be limited to the meanings specified in our definitions. They would have no general meaning beyond that.

By the same token, if we could agree that suicide rates, say, or giving to charity were good measures of the quality of a religion, then we could determine scientifically whether Buddhism or Christianity is the better religion. Again, our conclusion would be inextricably tied to our chosen criteria. As a practical matter, people seldom agree on precise criteria for determining issues of value, so science is seldom useful in settling such debates. In fact, questions like these are so much a matter of opinion and belief that scientific inquiry is often viewed as a threat to what is "already known."

We'll consider this issue in more detail in Chapter 12, when we look at evaluation research. As you'll see, researchers have become increasingly involved in studying social programs that reflect ideological points of view, such as affirmative action or welfare reform. One of the biggest problems they face is getting people to agree on criteria of success and failure. Yet such criteria are essential if social research is to tell us anything useful about matters of value. By analogy, a stopwatch cannot tell us if one sprinter is better than another unless we first agree that speed is the critical criterion.

Social science, then, can help us know only what is and why. We can use it to determine what ought to be only when people agree on the criteria for deciding what outcomes are better others—an agreement that seldom occurs.

As I indicated earlier, even knowing "what is and why" is no simple task. Let's turn now to some of the fundamental ideas that underlie social science's efforts to describe and understand social reality.

Social Regularities

In large part, social research aims to find patterns of regularity in social life. Although that aim is shared by all science, it is sometimes a barrier for people when they first approach social science.

Certainly at first glance the subject matter of the physical sciences seems to be more governed by regularities than does that of the social sciences. A heavy object falls to earth every time we drop it, but a person may vote for a particular candidate in one election and against that same candidate in the next. Similarly, ice always melts when heated enough, but habitually honest people sometimes steal. Despite such examples, however, social affairs do exhibit a high degree of regularity that

can be revealed by research and explained by theory.

To begin with, a vast number of formal norms in society create a considerable degree of regularity. For example, traffic laws in the United States induce the vast majority of people to drive on the right side of the street rather than the left. Registration requirements for voters lead to some predictable patterns in which classes of people vote in national elections. Labor laws create a high degree of uniformity in the minimum age of paid workers as well as the minimum amount they are paid. Such formal prescriptions regulate, or regularize, social behavior.

Aside from formal prescriptions, we can observe other social norms that create more regularities. Among registered voters, Republicans are more likely than Democrats to vote for Republican candidates. University professors tend to earn more money than do unskilled laborers. Men tend to earn more than women. And so on.

Three objections are sometimes raised in regard to such social regularities. First, some of the regularities may seem trivial. For example, Republicans vote for Republicans; everyone knows that. Second, contradictory cases may be cited, indicating that the "regularity" isn't totally regular. Some laborers make more money than do some professors. And third, it may be argued that, unlike the heavy objects that cannot decide *not* to fall when dropped, the people involved in the regularity could upset the whole thing if they wanted to.

Let's deal with each of these objections in turn.

The Charge of Triviality

During World War II, Samuel Stouffer, one of the greatest social science researchers, organized a research branch in the U.S. Army to conduct studies in support of the war effort (Stouffer et al. 1949–1950). Many of the studies concerned the morale among soldiers. Stouffer and his colleagues found there was a great deal of "common wisdom" regarding the bases of military morale. Much of their research was devoted to testing these "obvious" truths.

For example, people had recognized for a long time that promotions affect morale in the military. When military personnel get promotions and the promotion system seems fair, morale rises. Moreover, it makes sense that people who are getting promoted will tend to think the system is fair, whereas those passed over will likely think the system is unfair. By extension, it seems sensible that soldiers in units with slow promotion rates will tend to think the system is unfair, and those in units with rapid promotions will think the system is fair. But was this the way they really felt?

Stouffer and his colleagues focused their studies on two units: the Military Police (MPs), which had the slowest promotions in the Army, and the Army Air Corps (forerunner of the U.S. Air Force), which had the fastest promotions. It stood to reason that MPs would say the promotion system was unfair, and the air corpsmen would say it was fair. The studies, however, showed just the opposite.

Notice the dilemma faced by a researcher in a situation such as this. On the one hand, the observations don't seem to make sense. On the other hand, an explanation that makes obvious good sense isn't supported by the facts.

A lesser person would have set the problem aside "for further study." Stouffer, however, looked for an explanation for his observations, and eventually he found it. Robert Merton and some other sociologists at Columbia University had begun thinking and writing about something they called *reference group theory.* This theory says that people judge their lot in life less by objective conditions than by comparing themselves with others around them—their reference group. For example, if you lived among poor people, a salary of $50,000 a year would make you feel like a millionaire. But if you lived among people who earned $500,000 a year, that same $50,000 salary would make you feel impoverished.

Stouffer applied this line of reasoning to the soldiers he had studied. Even if a particular MP had not been promoted for a long time, it was unlikely that he knew some less deserving person who had gotten promoted faster. Nobody got promoted in the MPs. Had he been in the Air Corps—even if he had gotten several promotions in rapid succession—he would probably be able to point to someone less deserving who had gotten even faster pro-

motions. An MP's reference group, then, was his fellow MPs, and the air corpsman compared himself with fellow corpsmen. Ultimately, then, Stouffer reached an understanding of soldiers' attitudes toward the promotion system that (1) made sense and (2) corresponded to the facts.

This story shows that documenting the obvious is a valuable function of any science, physical or social. Charles Darwin coined the phrase "fool's experiment" to describe much of his own research—research in which he tested things that everyone else "already knew." As Darwin understood, all too often, the obvious turns out to be wrong; thus, apparent triviality is not a legitimate objection to any scientific endeavor.

What about Exceptions?

The objection that there are always exceptions to any social regularity does not mean that the regularity itself is unreal of unimportant. A particular woman may well earn more money than most men, but that will be a small consolation to the majority of women, who earn less. The pattern still exists. Social regularities, in other words, are probabilistic patterns, and they are no less real simply because some cases don't fit the general pattern.

This point applies in physical science as well as social science. Subatomic physics, for example, is a science of probabilities. In genetics, the mating of a blue-eyed person with a brown-eyed person will probably result in a brown-eyed offspring. The birth of a blue-eyed child does not destroy the observed regularity, because the geneticist states only that the brown-eyed offspring is more likely and, further, that brown-eyed offspring will be born in a certain percentage of the cases. The social scientist makes a similar, probabilistic prediction—that women overall are likely to earn less than men. Once a pattern like this is observed, the social scientist has grounds for asking why it exists.

People Could Interfere

Finally, the objection that observed social regularities could be upset through the conscious will of the actors is not a serious challenge to social science, even though there does not seem to be a parallel situation in the physical sciences. (Presumably physical objects cannot violate the laws of physics, although the probabilistic nature of subatomic physics once led some observers to postulate that electrons had free will.) There is no denying that a religious, right-wing bigot could go to the polls and vote for an agnostic, left-wing African American if he wanted to upset political scientists studying the election. All voters in an election could suddenly switch to the underdog just to frustrate the pollsters. Similarly, workers could go to work early or stay home from work and thereby prevent the expected rush-hour traffic. But these things do not happen often enough to threaten seriously the observation of social regularities.

Social regularities, then, do exist, and social scientists can detect them and observe their effects. When these regularities change over time, social scientists can observe and explain those changes.

Aggregates, Not Individuals

The regularities of social life that social scientists study generally reflect the collective behavior of many individuals. Although social scientists often study motivations that affect individuals, the individual as such is seldom the subject of social science. Instead, social scientists create theories about the nature of group, rather than individual, life. Similarly, the objects of their research are typically aggregates, or collections, rather than individuals.

Sometimes the collective regularities are amazing. Consider the birthrate, for example. People have babies for any number of personal reasons. Some do it because their own parents want grandchildren. Some feel it's a way of completing their womanhood or manhood. Others want to hold their marriages together, enjoy the experience of raising children, perpetuate the family name, or achieve a kind of immortality. Still others have babies by accident.

If you have fathered or given birth to a baby, you could probably tell a much more detailed, idiosyncratic story. Why did you have the baby when you did, rather than a year earlier or later? Maybe

TABLE 1-1

Birthrates, United States: 1977–1996

1977	15.1	1987	15.7
1978	15.0	1988	16.0
1979	15.6	1989	16.4
1980	15.9	1990	16.7
1981	15.8	1991	16.3
1982	15.9	1992	15.9
1983	15.6	1993	15.5
1984	15.6	1994	15.2
1985	15.8	1995	14.8
1986	15.6	1996	14.7

Source: Centers for Disease Control and Prevention, National Center for Health Statistics (1998), *Monthly Vital Statistics Report* 46 (11, Suppl.): 29.

you lost your job and had to delay a year before you could afford to have the baby. Maybe you only felt the urge to become a parent after someone close to you had a baby. Everyone who had a baby last year had their own reasons for doing so. Yet, despite this vast diversity, and despite the idiosyncrasy of each individual's reasons, the overall birthrate in a society—the number of live births per 1,000 population—is remarkably consistent from year to year. See Table 1-1 for 20 years of birthrates for the United States.

If the U.S. birthrate were 15.9, 35.6, 7.8, 28.9, and 16.2 in five successive years, demographers would begin dropping like flies. As you can see, however, social life is far more orderly than that. Moreover, this regularity occurs without society-wide regulation. No one plans how many babies will be born or determines who will have them. You do not need a permit to have a baby; in fact, many babies are conceived unexpectedly, and some are borne by unwilling mothers.

Social scientific theories, then, typically deal with aggregated, not individual, behavior. Their purpose is to explain why aggregate patterns of behavior are so regular even when the individuals participating in them may change over time. It could be said that social scientists don't even seek to explain people. They try to understand the systems in which people operate, the systems that explain why people do what they do. The elements in such a system are not people but variables.

A Variable Language

Our most natural attempts at understanding usually take place at the level of the concrete and idiosyncratic. That's just the way we think.

Imagine that someone says to you, "Women ought to get back into the kitchen where they belong." You are likely to hear that comment in terms of what you know about the speaker. If it's your old uncle Harry who, you recall, is also strongly opposed to daylight saving time, zip codes, and personal computers, you are likely to think his latest pronouncement simply fits into his rather dated point of view about things in general. If, on the other hand, the statement was muttered by an incumbent politician who was trailing a female challenger in an election race, you would probably explain his comment in a completely different way.

In both examples, you're trying to understand the behavior of a particular individual. *Social* research seeks insights into classes or types of individuals. Social researchers would want to find out about the kind of people who share that view of women's "proper" role. Do those people have other characteristics in common that may help explain their views?

Even when researchers focus their attention on a single case study—such as a community or a juvenile gang—their aim is to gain insights that would help people understand other communities and other juvenile gangs. Similarly, the attempt to fully understand one individual carries the broader purpose of understanding people or types of people in general.

When this venture into understanding and explanation ends, social researchers will be able to make sense out of more than one person. In understanding what makes a group of people hostile to women who are active outside the home, they gain insight into all the individuals who share that characteristic. This is possible because, in an important sense, they have not been studying antifeminists as much as they have been studying antifeminism. It might be then turn out that Uncle Harry

and the politician have more in common than first appeared.

Antifeminism is spoken of as a **variable** because it varies. Some people display the attitude more than others. Social researchers are interested in understanding the system of variables that causes a particular attitude to be strong in one instance and weak in another.

The idea of a system composed of variables may seem rather strange, so let's look at an analogy. The subject of a physician's attention is the patient. If the patient is ill, the physician's purpose is to help the patient get well. By contrast, a medical researcher's subject matter is different: the variables that cause a disease, for example. The medical researcher may study the physician's patient, but for the researcher, that patient is relevant only as a carrier of the disease.

That is not to say that medical researchers don't care about real people. They certainly do. Their ultimate purpose in studying diseases is to protect people from them. But in their research, they are less interested in individual patients than they are in the patterns governing the appearance of the disease. In fact, when they can study a disease meaningfully without involving actual patients, they do so.

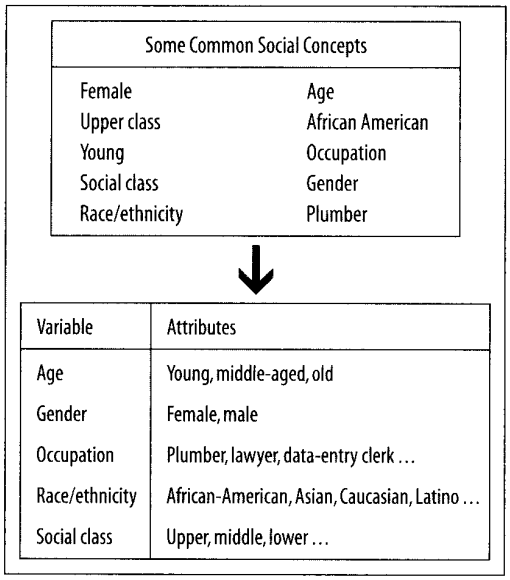
Social research, then, involves the study of variables and their relationships. Social theories are written in a language of variables, and people get involved only as the "carriers" of those variables.

Variables, in turn, have what social researchers call **attributes** or values. Attributes are characteristics or qualities that describe an object—in this case, a person. Examples include female, Asian, alienated, conservative, dishonest, intelligent, and farmer. Anything you might say to describe yourself or someone else involves an attribute.

Variables, on the other hand, are logical groupings of attributes. Thus, for example, male and female are attributes, and sex or gender are the variables composed of those two attributes. The variable *occupation* is composed of attributes such as farmer, professor, and truck driver. *Social class* is a variable composed of a set of attributes such as upper class, middle class, and lower class. Sometimes it helps to think of attributes as the "categories"

FIGURE 1-4

Variables and Attributes. In social research and theory, both variables and attributes represent social concepts. Variables are sets of related values, or attributes.



that make up a variable. (See Figure 1-4 for a schematic review of what social scientists mean by variables and attributes.)

The relationship between attributes and variables lies at the heart of both description and explanation in science. For example, we might describe a college class in terms of the variable *gender* by reporting the observed frequencies of the attributes male and female: "The class is 60 percent men and 40 percent women." An unemployment rate can be thought of as a description of the variable *employment status of a labor force* in terms of the attributes employed and unemployed. Even the report of *family income for a city* is a summary of attributes composing that variable: $3,124; $10,980; $35,000; and so forth.

Sometimes the meanings of the concepts that lie behind social science concepts are immediately clear. Other times they aren't. This point is discussed in the box "The Hardest Hit Was . . . "

The relationship between attributes and variables is more complicated in the case of explanation

The Hardest Hit Was . . .

In early 1982, a deadly storm ravaged the San Francisco Bay Area, leaving an aftermath of death, injury, and property damage. As the mass media sought to highlight the most tragic results of the storm, they sometimes focused on several people who were buried alive in a mud slide in Santa Cruz. Other times, they covered the plight of the 2,900 made homeless in Marin County.

Implicitly, everyone wanted to know where the worst damage was done, but the answer was not clear. Here are some data describing the results of the storm in two counties: Marin and Santa Cruz. Look over the comparisons and see if you can determine which county was "hardest hit."

	Marin	*Santa Cruz*
Businesses destroyed	$15.0 million	$56.5 million
People killed	5	22
People injured	379	50
People displaced	370	400
Homes destroyed	28	135
Homes damaged	2,900	300
Businesses destroyed	25	10
Businesses damaged	800	35
Private damages	$65.1 million	$50.0 million
Public damages	$15.0 million	$56.5 million

Certainly, in terms of the loss of life, Santa Cruz was the "hardest hit" of the two counties. Yet more than seven times as many people were injured in Marin as in Santa Cruz; certainly, Marin County was "hardest hit" in that regard. Or consider the number of homes destroyed (worse in Santa Cruz) or damaged (worse in Marin): It matters which you focus on. The same dilemma holds true for the value of the damage done: Should we pay more attention to private damage or public damage?

So which county was "hardest hit"? Ultimately, the question as posed has no answer. While you and I both have images in our minds about communities that are "devastated" or communities that are only "lightly touched," these images are not precise enough to permit rigorous measurements.

The question can be answered only if we can specify what we mean by "hardest hit." If we measure it by death toll, then Santa Cruz was the hardest hit. If we choose to define the variable in terms of people injured and/or displaced, then Marin was the bigger disaster. The simple fact is that we cannot answer the question without specifying exactly what we mean by the term *hardest hit*. This is a fundamental requirement that will arise again and again as we attempt to measure social science variables.

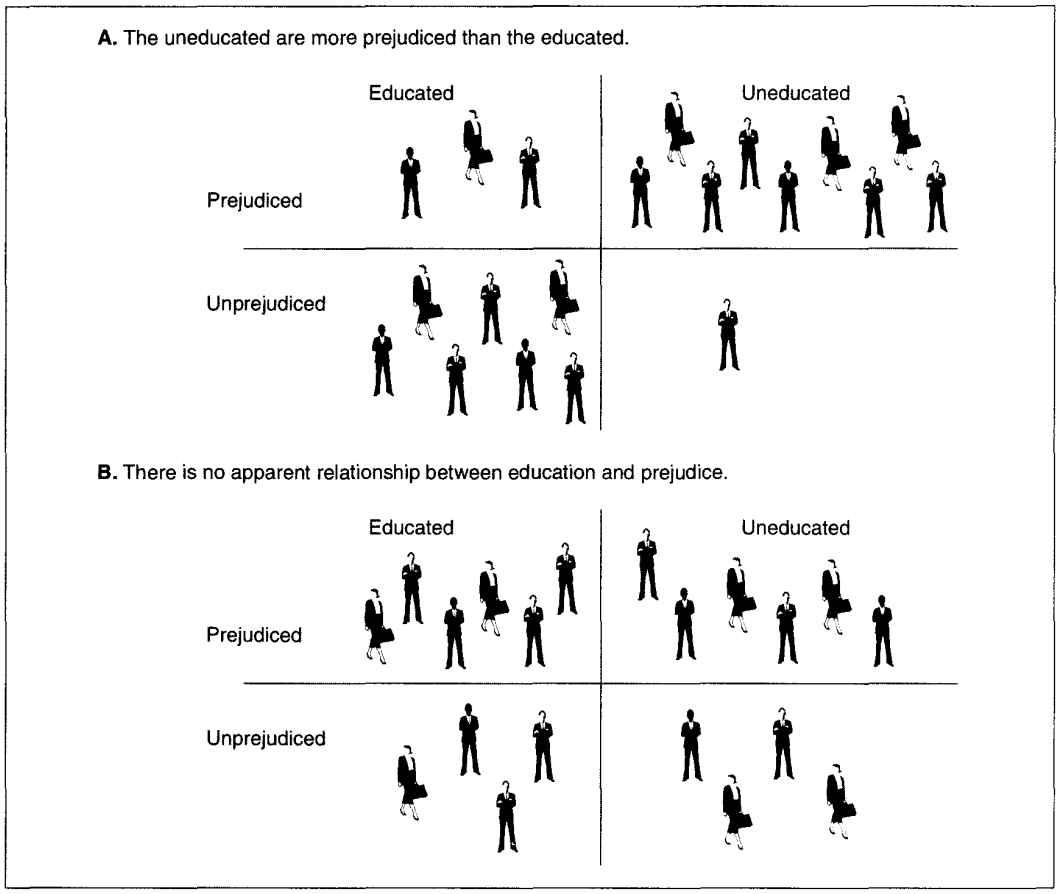
Data source: San Francisco Chronicle, January 13, 1982, p. 16.

and gets to the heart of the variable language of scientific theory. Here's a simple example, involving two variables, education and prejudice. For the sake of simplicity, let's assume that the variable *education* has only two attributes: educated and uneducated. Similarly, let's give the variable *prejudice* two attributes: prejudiced and unprejudiced.

Now let's suppose that 90 percent of the uneducated are prejudiced, and the other 10 percent are unprejudiced. And let's suppose that 30 percent of the educated people are prejudiced, and the other 70 percent are unprejudiced. This is illustrated graphically in Figure 1-5A.

Figure 1-5A illustrates a relationship or association between the variables *education* and *prejudice*. This relationship can be seen in terms of the pairings of attributes on the two variables. There are two predominant pairings: (1) those who are edu-

FIGURE 1-5
Illustration of Relationship between Two Variables (Two Possibilities)



cated and unprejudiced and (2) those who are uneducated and prejudiced. Here are two other useful ways of viewing that relationship.

First, let's suppose that we play a game in which we bet on your ability to guess whether a person is prejudiced or unprejudiced. I'll pick the people one at a time (not telling you which ones I've picked), and you have to guess whether each person is prejudiced. We'll do it for all 20 people in Figure 1-5A. Your best strategy in this case would be to guess prejudiced each time, since 12 out of the 20 are categorized that way. Thus, you'll get 12 right and 8 wrong, for a net success of 4.

Now let's suppose that when I pick a person from the figure, I have to tell you whether the person is educated or uneducated. Your best strategy now would be to guess prejudiced for each uneducated person and unprejudiced for each educated person. If you followed that strategy, you'd get 16 right and 4 wrong. Your improvement in guessing prejudice by knowing education is an illustration of what it means to say that the variables are related.

Second, by contrast, let's consider how the 20 people would be distributed if education and prejudice were unrelated to one another. This is illustrated in Figure 1-5B. Notice that half the people are educated, and half are uneducated. Also notice that 12 of the 20 (60 percent) are prejudiced. If 6 of the 10 people in each group were prejudiced, we would conclude that the two variables were

unrelated to each other. Then knowing a person's education would not be of any value to you in guessing whether that person was prejudiced.

We'll be looking at the nature of relationships between variables in some depth in Part 4. In particular, we'll explore some of the ways relationships can be discovered and interpreted in research analysis. For now, though, a general understanding of relationships is important so that you can appreciate the logic of social scientific theories.

Theories describe the relationships we might logically expect between variables. Often, the expectation involves the idea of causation. That is, a person's attributes on one variable are expected to cause, predispose, or encourage a particular attribute on another variable. In the example just illustrated, we might theorize that a person's being educated or uneducated causes a lesser or greater likelihood of that person seeming prejudiced.

As I'll discuss in more detail later in the book, *education* and *prejudice* in this example would be regarded as **independent variables** and **dependent variables,** respectively. These two concepts are implicit in causal, or deterministic, models. In this example, we assume that the likelihood of being prejudiced is determined or caused by something. In other words, *prejudice* depends on something else, and so it is called the dependent variable. What the dependent variable depends on is an independent variable, in this case, *education*. For the purposes of this study, *education* is an "independent" variable because it is independent of *prejudice* (that is, people's level of education is not caused by whether or not they are prejudiced).

Of course, variations in levels of education can, in turn, be found to depend on something else. People whose parents have a lot of education, for example, are more likely to get a lot of education than are people whose parents have little education. In this relationship, the subject's education is the dependent variable, and the parents' education is the independent variable. We can say the independent variable is the cause, the dependent variable the effect.

Returning to our first example, the discussion of Figure 1-5 has involved the interpretation of data. We looked at the distribution of the 20 people in terms of the two variables. In constructing a social scientific theory, we would derive an expectation regarding the relationship between the two variables based on what we know about each. We know, for example, that education exposes people to a wide range of cultural variation and to diverse points of view—in short, it broadens their perspectives. Prejudice, on the other hand, represents a narrower perspective. Logically, then, we might expect education and prejudice to be somewhat incompatible. We might therefore arrive at an expectation that increasing education would reduce the occurrence of prejudice, an expectation that would be supported by our observations.

Since Figure 1-5 has illustrated two possibilities—that education reduces the likelihood of prejudice or that it has no effect—you might be interested in knowing what is actually the case. As one measure of prejudice, the 1996 General Social Survey asked a national sample of adults in the United States how they felt about the opinion, "White people have a right to keep Blacks out of their neighborhoods if they want to and Blacks should respect that right." Only 6 percent of the sample agreed strongly with the statement, with another 5 percent agreeing slightly. The majority—71 percent—strongly disagreed.

Table 1-2 presents an analysis of those data, grouping respondents according to their levels of educational attainment. The easiest way to read this table is to focus on the last line of percentages: those disagreeing strongly with the statement. Strong opposition to segregation increases steadily from 62 percent among those who had completed high school (or less) to 85 percent among college graduates. This finding clearly supports the view that education reduces prejudice, as prejudice was measured in this study.

Notice that the theory has to do with the two variables *education* and *prejudice,* not with people as such. People are the carriers of those two variables, so the relationship between the variables can only be seen when we observe people. Ultimately, however, the theory uses a language of variables. It describes the associations that we might logically expect to exist between particular attributes of different variables.

TABLE 1-2
Education and Support for Segregation

	Educational Level of Respondents			
	Less than HS Graduate	*HS Graduate*	*Some College*	*College Graduate*
Agree strongly	10%	7%	6%	1%
Agree slightly	8	5	5	4
Disagree slightly	19	26	18	10
Disagree strongly	62	62	70	85
	100% = (98)	(189)	(190)	(193)

Some Dialectics of Social Research

There is no one way to do social research. (If there were, this would be a much shorter book.) In fact, much of the power and potential of social research lies in the many valid approaches it comprises.

Three broad and interrelated distinctions, however, underlie the variety of research approaches. Although these distinctions can be seen as competing choices, a good social researcher learns each of these orientations. This is what I mean by the "dialectics" of social research: There is a fruitful tension between the complementary concepts I'm about to describe.

Idiographic and Nomothetic Explanation

All of us go through life explaining things. We do it every day. You explain why you did poorly or well on an exam, why your favorite team is winning or losing, why you may be having trouble getting good dates or a decent job. In our everyday explanations, we engage in two distinct forms of causal reasoning, though we do not ordinarily distinguish them.

Sometimes we attempt to explain a single situation exhaustively. Thus, for example, you may have done poorly on an exam because (1) you had forgotten there was an exam that day, (2) it was in your worst subject, (3) a traffic jam made you late for class, (4) your roommate kept you up the night before the exam by playing loud music, (5) the police kept you until dawn demanding to know what you had done with your roommate's stereo—and what you had done with your roommate, for that matter—and (6) a wild band of coyotes ate your textbook. Given all these circumstances, it's no wonder you did poorly.

This type of causal reasoning is called an **idiographic** explanation. *Idio-* in this context means unique, separate, peculiar, or distinct, as in the word idiosyncrasy. When we have completed an idiographic explanation, we feel that we fully understand the causes of what happened in this particular instance. At the same time, the scope of our explanation is limited to the single case at hand. While parts of the idiographic explanation might apply to other situations, our intention is to explain one case fully.

Now consider a different kind of explanation. (1) Every time you study with a group, you do better on the exam than if you study alone. (2) Your favorite team does better at home than on the road. (3) Fraternity and sorority members get more dates than do members of the biology club. This type of explanation—labeled **nomothetic**—seeks to explain a class of situations or events rather than a single one. Moreover, it seeks to explain "economically," using only one or just a few explanatory factors. Finally, it settles for a partial rather than a full explanation.

In each of these examples, you might qualify your causal statements with such words or phrases

as "on the whole," "usually," or "all else being equal." Thus, you usually do better on exams when you've studied in a group, but not always. Similarly, your team has won some games on the road and lost some at home. And the attractive head of the biology club may get lots of good dates, while the homely members of sororities and fraternities spend a lot of Saturday nights alone working crossword puzzles. The existence of such exceptions is the price we pay for a broader range of overall explanation. As we noted earlier, patterns are real and important even when they are not perfect.

Both the idiographic and the nomothetic approaches to understanding can be useful in daily life. The nomothetic patterns you discover might offer a good guide for planning your study habits, for example, while the idiographic explanation might be more convincing to your parole officer.

By the same token, both idiographic and nomothetic reasoning are powerful tools for social research. Consider first idiographic reasoning. The researcher who seeks an exhaustive understanding of the inner workings of a particular juvenile gang or the corporate leadership of a particular multinational conglomerate engages in idiographic research: She or he tries to understand that particular group as fully as possible.

The researcher David Wellman (1995), for example, undertook an in-depth analysis of class consciousness among members of Local 10 of San Francisco's International Longshoremen's and Warehousemen's Union (ILWU). Wellman recognized that this particular union did not typify the U.S. labor movement. While he was interested in gaining insights into labor unionism generally and into the nature of capitalism, his immediate goal was to fully understand the history of Local 10 fully.

Often, however, researchers aim at a more generalized understanding across a class of events—in other words, a nomothetic explanation—even though the level of understanding is inevitably less complete with respect to any one case. For example, researchers who seek to uncover the chief factors leading to juvenile delinquency are pursuing a nomothetic inquiry. They might discover that children from broken homes are more likely to be delinquent than those from intact families. This explanation would extend well beyond any single child, but it would do so at the expense of a complete explanation of any one child's delinquency.

In contrast to the Wellman study of Local 10, Susan Tiano (1994) sought to understand the overall impact of Third-World industrialization on the status of women. Does women's movement into the industrial labor force signify liberation or oppression? Her survey of women factory workers in Mexico illustrates the nomothetic approach to understanding.

Social scientists, though, can access two distinct kinds of explanation. Just as physicists treat light sometimes as a particle and other times as a wave, so social scientists can search for broad relationships today and probe the narrowly particular tomorrow. Both are good science, both are rewarding, and both can be fun.

Inductive and Deductive Theory

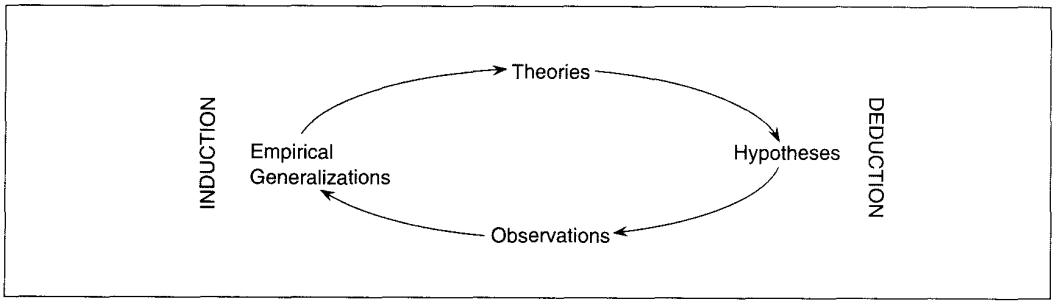
Like idiographic and nomothetic forms of explanation, inductive and deductive thinking both play a role in our daily lives. They, too, represent an important variation in social research.

There are two routes to the conclusion that you do better on exams if you study with others. On the one hand, you might find yourself puzzling, halfway through your college career, why you do so well on exams sometimes but poorly at other times. You might list all the exams you've taken, noting how well you did on each. Then you might try to recall any circumstances shared by all the good exams and by all the poor ones. Did you do better on multiple-choice exams or essay exams? Morning exams or afternoon exams? Exams in the natural sciences, the humanities, or the social sciences? Times when you studied alone or . . . SHAZAM! It occurs to you that you have almost always done best on exams when you studied with others. This mode of inquiry is known as *induction.*

Inductive reasoning, or **induction,** moves from the particular to the general, from a set of specific observations to the discovery of a pattern that represents some degree of order among all the given events. Notice, incidentally, that your discov-

FIGURE 1-6

The Wheel of Science. The theory and research cycle can be compared to a relay race; although all participants do not necessarily start or stop at the same point, they share a common goal—to examine all levels of social life.



Source: Adapted from Walter Wallace, *The Logic of Science in Sociology* (New York: Aldine deGruyter, 1971). Copyright © 1971 by Walter L. Wallace. Used by permission.

ery doesn't necessarily tell you *why* the pattern exists—just that it does.

There is a second and a very different way that you might arrive at the same conclusion about studying for exams. Imagine approaching your first set of exams in college. You wonder about the best ways to study—how much you should review the readings, how much you should focus on your class notes. You learn that some students prepare by rewriting their notes in an orderly fashion. Then you consider whether you should study at a measured pace or else pull an all-nighter just before the exam. Among these kinds of musings, you might ask whether you should get together with other students in the class or just study on your own. You could evaluate the pros and cons of both options.

Studying with others might not be as efficient, because a lot of time might be spent on things you already understand. On the other hand, you can understand something even better when you've explained it to someone else. And other students might understand parts of the course that you haven't gotten yet. Several minds can reveal perspectives that might have escaped you. Also, your commitment to study with others makes it more likely that you'll study rather than watch the special *Brady Bunch* retrospective.

In this fashion, you might add up the pros and the cons and conclude, logically, that you'd benefit from studying with others. It seems reasonable to you, the way it seems reasonable that you'll do better if you study rather than not. Sometimes, we say things like this are true "in theory." To complete the process, we test whether they are true in practice. For a complete test, you might study alone for half your exams and study with others for the other exams. This procedure would test your logical reasoning.

This second mode of inquiry, known as deductive reasoning or **deduction,** moves from the general to the specific. It moves from (1) a pattern that might be logically or theoretically expected to (2) observations that test whether the expected pattern actually occurs. Notice that deduction begins with "why" and moves to "whether," while induction moves in the opposite direction.

These two very different approaches are both valid avenues for science. Moreover, they frequently work together to provide ever more powerful and complete understandings, as pictured in Figure 1-6.

Notice, by the way, that the distinction between deductive and inductive reasoning is not necessarily linked to the distinction between nomothetic and idiographic modes of explanation. These four characterizations represent four possibilities, in everyday life as much as in social research.

For example, idiographically and deductively, you might prepare for a particular date by taking into account everything you know about the person

you're dating, trying to anticipate logically how you can prepare—what kinds of clothing, behavior, hairstyle, oral hygiene, and so forth are likely to produce a successful date. Or, idiographically and inductively, you might try to figure out what it was exactly that caused your date to call 911.

A nomothetic, deductive approach arises when you coach others on your "rules of dating," when you wisely explain why their dates will be impressed to hear them expound on the dangers of satanic messages concealed in rock and roll lyrics. When you later review your life and wonder why you didn't date more musicians, you might engage in nomothetic induction.

We'll return to induction and deduction in Chapter 2. Let's turn now to a third broad distinction that generates rich variations in social research.

Qualitative and Quantitative Data

The distinction between quantitative and qualitative data in social research is essentially the distinction between numerical and nonnumerical data. When we say someone is intelligent, we've made a qualitative assertion. A corresponding assertion about someone less fortunately endowed would be that he or she is "unintelligent." When psychologists and others measure intelligence by IQ scores, they are attempting to quantify such qualitative assessments. For example, the psychologist might say that a person has an IQ of 120.

Every observation is qualitative at the outset, whether it is our experience of someone's intelligence, the location of a pointer on a measuring scale, or a check mark entered in a questionnaire. None of these things is inherently numerical or quantitative, but sometimes it is useful to convert them to a numerical form.

Quantification often makes our observations more explicit. It also can make it easier to aggregate, compare, and summarize data. Further, it opens up the possibility of statistical analyses, ranging from simple averages to complex formulas and mathematical models.

Quantitative data, then, have the advantages that numbers have over words as measures of some quality. On the other hand, they also have the disadvantages that numbers have, including a potential loss in richness of meaning. For example, a social researcher might want to know whether college students aged 18–22 tend to date people older or younger than themselves. A quantitative answer to this question seems easily attained. The researcher asks a number of college students how old each of their dates has been, calculates an average, and compares it with the age of the subject. Case closed.

Or is it? While "age" here represents the number of years people have been alive, sometimes people use the term differently; perhaps for some "age" really means "maturity." Though your dates may tend to be younger than you, you may date people who act more maturely and thus represent the same "age." Or someone might see "age" as how young or old your dates look or maybe the degree of variation in their life experiences and worldliness. These latter meanings would be lost in the quantitative calculation of average age. Qualitative data, in short, can be richer in meaning than quantified data. This is implicit in the cliché, "He is older than his years." The poetic meaning of this expression would be lost in attempts to specify how much older.

On the other hand, qualitative data can have the disadvantages of purely verbal descriptions. For example, the richness of meaning I've mentioned is partly a function of ambiguity. If the expression "older than his years" meant something to you when you read it, that meaning arises from your own experiences, from people you have known who might fit the description of being "older than their years" or perhaps the times you have heard others use that expression. Two things are certain: (1) You and I probably don't mean exactly the same thing, and (2) you don't know exactly what I mean, and vice versa.

I have a young friend, Ray Zhang, who was responsible for communications at the 1989 freedom demonstrations in Tiananmen Square, Beijing. Following the Army clampdown, Ray fled south, was arrested, and was then released with orders to return to Beijing. Instead, he escaped from China and made his way to Paris. Eventually he came to the United States, where he resumed the graduate

studies he had been forced to abandon in fleeing his homeland. I have seen him deal with the difficulties of getting enrolled in school without any transcripts from China, studying in a foreign language, meeting his financial needs—all on his own, thousands of miles from his family. Ray still speaks of one day returning to China to build a system of democracy.

Ray strikes me as someone "older than his years." You probably agree. The additional detail in my qualitative description, while it fleshes out the meaning of the phrase, still does not equip us to say how much older or even to compare two people in these terms without the risk of disagreeing as to which one is more "worldly."

It might be possible to quantify this concept, however. For example, we might establish a list of life experiences that would contribute to what we mean by worldliness, for example:

Getting married
Getting divorced
Having a parent die
Seeing a murder committed
Being arrested
Being exiled
Being fired from a job
Running away with the circus

We might quantify people's worldliness as the number of such experiences they've had: the more such experiences, the more worldly we'd say they were. If we thought of some experiences as more powerful than others, we could give those experiences more points. Once we had made our list and point system, scoring people and comparing their worldliness on a numerical scale would be straightforward. We would have no difficulty agreeing on who had more points than whom.

To quantify a nonnumerical concept like worldliness, then, we need to be explicit about what the concept means. By focusing specifically on what we will include in our measurement of the concept, however, we also exclude any other meanings. Inevitably, then, we face a trade-off: Any explicated, quantitative measure will be less rich in meaning than the corresponding qualitative description.

What a dilemma! Which approach should we choose? Which is better? Which is more appropriate to social research?

The good news is that we don't need to choose. In fact, we shouldn't. Both qualitative and quantitative methods are useful and legitimate in social research. Some research situations and topics are most amenable to qualitative examination, others to quantification.

While researchers may use both, these two approaches call for different skills and procedures. As a result, you may find that you feel more comfortable with—and become more adept in—one or the other. You will be a stronger researcher, however, to the extent that you can use both approaches effectively. Certainly, all researchers, whatever their personal inclinations, should recognize the legitimacy of both.

You may have noticed that the qualitative approach seems more aligned with idiographic explanations, while nomothetic explanations are more easily achieved through quantification. Although this is true, these relationships are not absolute. Moreover, both approaches present considerable "gray area." Recognizing the distinction between qualitative and quantitative research doesn't mean that you must identify your research activities with one to the exclusion of the other. A complete understanding of a topic often requires both techniques.

The Ethics of Social Research

Most of this book is devoted to the logic and skills of doing social research, the various techniques preferred by social researchers, and the reasons why researchers value them. There are, however, some vital nonscientific concerns that shape the activities of social researchers. A key concern is the matter of ethics in research.

Chapter 18 of this book deals extensively with research ethics, and other chapters will refer to ethical issues as appropriate. Here, I want to introduce two basic ethical issues to keep in mind as you read the rest of this book.

Voluntary Participation

A basic ethical rule of social research is that participation should be voluntary. In principle, this appears to be a pretty simple rule to follow. An experimenter who forced people to participate in an experiment would be roundly criticized. Similarly, forcing people to fill our a survey by locking them in a room or threatening them with some dire consequence if they refuse (perhaps a failing grade in a course) would clearly be unethical.

Yet things are not always so clear-cut. When we formally observe a campus demonstration, we do not ask for permission from all the participants. When a researcher pretends to join a religious cult to do research on it, those being observed have not really volunteered for the research project. Social researchers often debate whether a particular research design did or did not violate established research ethics. As you review research already done or think about your own research designs, ask yourself whether the chosen technique honors the principle of voluntary participation.

No Harm to Subjects

The fundamental ethical rule of social research is that it bring no harm to research subjects. Surely no one would disagree with this rule in principle. You will see, however, that it is sometimes difficult to follow this rule absolutely.

Suppose, for example, that some of the people that researchers interview about their religious views realize for the first time that they have doubts about their religion. Or suppose a study of the treatment of women in society leads some women to become unhappy with their jobs or marriages. When does investigating a subject do harm by affecting the people who take part in the study?

As we'll see, abiding by the seemingly simple ethical rule to do no harm requires vigilance on the part of researchers. In designing your own studies, be sure to ask yourself whether your research could harm the people you intend to study. Since everything we do in life could possibly harm someone else, all researchers must weigh the relative risk against the importance and possible benefits of the research activity.

Social researchers have many ways to guard against harming people. For example, we are careful to respect the privacy of subjects. Research often requires our learning private details of people's lives, and we are committed to maintain the confidentiality of what we learn. Often we collect information anonymously, so there is no way of identifying individuals with the information they voluntarily provide, thus preventing even the accidental release of information.

You'll see that while deception is often necessary in the execution of some kinds of research projects, researchers are committed to avoiding deception except when it is inescapable. (For example, if you introduce a survey or experiment by saying, "We want to learn how prejudiced you are," the subjects will likely modify what they do and say, so as to appear unprejudiced.) When it is deemed necessary to deceive people as to our research purposes, however, we must ask whether the potential value of the research justifies the act of deception.

The seriousness of ethical concerns is evident in the codes of ethics created and published by professional associations whose members engage in social research. These codes deal with issues of voluntary participation, not harming subjects, and many other topics, as you'll see in Chapter 18.

These, then, are some of the foundations of social research. I hope this discussion has helped to show how social science is anything but routine or boring. At its best, it is a vibrant, exciting, and important activity. All we need is an open mind and a sense of adventure.

MAIN POINTS

- The subject of this book is how we find out about social reality.
- Inquiry is a natural human activity. Much of ordinary human inquiry seeks to explain events and predict future events.
- When we understand through direct experience, we make observations and seek patterns of regularities in what we observe.

- Much of what we know, we know by agreement rather than by experience. In particular, two important sources of agreed-upon knowledge are tradition and authority. However, these useful sources of knowledge can also lead us astray.
- Science seeks to protect against the mistakes we make in day-to-day inquiry.
- Whereas we often observe inaccurately, researchers seek to avoid such errors by making observation a careful and deliberate activity.
- We sometimes jump to general conclusions on the basis of only a few observations, so scientists seek to avoid overgeneralization by committing themselves to a sufficient number of observations and by replicating studies.
- In everyday life we sometimes reason illogically. Researchers seek to avoid illogical reasoning by being as careful and deliberate in their reasoning as in their observations. Moreover, the public nature of science means that others are always there to challenge faulty reasoning.
- Three views of "reality" are the premodern, modern, and postmodern views. In the postmodern view, there is no "objective" reality independent of our subjective experiences. Different philosophical views suggest a range of possibilities for scientific research.
- Social theory attempts to discuss and explain what is, not what should be. Theory should not be confused with philosophy or belief.
- Social science looks for regularities in social life.
- Social scientists are interested in explaining human aggregates, not individuals.
- Theories are written in the language of variables.
- A variable is a logical set of attributes. An attribute is a characteristic, such as male or female. *Gender*, for example, is a variable made up of these attributes.
- In causal explanation, the presumed cause is the independent variable, while the affected variable is the dependent variable.
- Whereas idiographic explanations seek to understand specific cases fully, nomothetic explanations seek a generalized understanding of many cases.
- Inductive theories reason from specific observations to general patterns. Deductive theories start from general statements and predict specific observations.
- Quantitative data are numerical; qualitative data are not. Both types of data are useful for different research purposes.
- Ethics is a key consideration in the design of social research. Two fundamental ethical guidelines are that participation in social research should be voluntary and that no harm should come to research subjects.

KEY TERMS

The following terms are defined in context in the chapter and can also be found in the Glossary at the back of the book.

replication	dependent variable
theory	idiographic
variable	nomothetic
attribute	induction
independent variable	deduction

REVIEW QUESTIONS AND EXERCISES

1. Review the common errors of human inquiry discussed in this chapter. Find a magazine or newspaper article, or perhaps a letter to the editor, that illustrates one of these errors. Discuss how a scientist would avoid it.
2. List five social variables and the attributes they comprise.
3. Go to one of the following Web sites and find examples of both qualitative and quantitative data.
   a. UN High Commissioner for Refugees: http://www.unhcr.ch/
   b. U.S. Centers for Disease Control and Prevention: http://www.cdc.gov/
   c. National Library of Australia: http://www.nla.gov.au/