Chapter 1

Ways of Thinking and Knowing

Recognizing Importance of Research Methods and Relevance of Research

As was noted in the preface, research methods are of general interest in part because they have developed and employ approaches that in many ways parallel what we all regularly do in everyday life. Even if we know nothing about science or research, we routinely engage in processes of formulating ideas or notions about why things happen or how things work (hypotheses) and seeing whether they happen as we expect them to (testing their plausibility). Such processes give us an intuitive

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understanding of research and research methods, and what they potentially can do. Throughout our lives we seek to explain and understand what goes on in the world around us and, in some instances, even control it. We observe what happens, sometimes even creating what happens, and use information from what we observe to draw conclusions.

Think, for example, what people do frequently in their own lives. If you smoke you may decide that you need to stop smoking, and develop ideas and a plan about how you can stop. Similarly, if you would like to lose weight, spend more time studying, or become a more successful athlete, you might develop ideas and plans about how to reach your goal. Assuming you follow your plan, you will see over time whether that plan is successful. How successful you believe you are depends on what you had decided would constitute success – your expectations affect how you identify a goal that would signify success. If the goal is set high, chances of success likely will be lower. You may start with an ambitious goal and later modify it. If the plan is something you decided, you control, and that affects only you, nothing prevents you from modifying your definition of success as time passes. Regardless of how much you change your goal, at some point you likely would reflect on your goal and decide whether you are attaining it. If not, you could try an alternative approach to increase your success. You also could decide that it no longer is important or that it is simply not attainable, and in either case stop trying to attain it.

Similarly, researchers seek to understand and explain phenomena like how and why people do what they do, and, in some instances, to control or change behaviors. Most social and behavioral scientists believe that there are general laws that can explain and predict behaviors, that those laws can be discerned through or derived from collection and analysis of data, and that empirical research can identify those laws and how they operate. Even though researchers today are less likely to express the processes they identify in terms of formal hypotheses, corollaries, derivations, etc. (for an example, see Festinger's (1954) landmark paper on social comparison processes), they nevertheless follow a scientific process of hypothesis generation and testing. In that process, researchers do the same things that we do as individuals except, as will be explained in detail later in this chapter, they are required to worry more about the accuracy of the inferences they draw. And they typically are not allowed to change their hypotheses, target outcomes, or their approach in the middle of an ongoing research study, although they could decide that the research study isn't working and stop it. Further, researchers typically consider a larger set of outcomes than those individuals personally choose to define their success. For example, researchers who study smoking cessation or weight reduction programs need to know how well the programs work (how much do you still smoke, how much do you now weigh?), but also whether they work better than alternative programs, why they work, and whether or not they work only for some people or under specific conditions. They also worry about how sustainable changes are over time. And, tied to the search for general laws, researchers worry about things like generalizability of findings, that is, whether particular findings represent widely applicable outcomes or are specific to the setting and/or the sample.

As you go through this book, we hope that you occasionally step back and appreciate the range of approaches and methods researchers use as they go about gathering

information. Some choose laboratory experimentation, others field-based research that may or may not be experimental, still others surveys, and others observational methods or interviews. Some have samples in the thousands, others just one subject. Most researchers specialize, choosing particular techniques and approaches that they find most appealing and with which they are most comfortable. At the same time, however, they recognize and appreciate the richness of information yielded by diverse approaches to particular problems and respect others who are skilled at using different approaches. Knowledge about social phenomena is increased when different approaches are used to provide different perspectives on what is happening. For example, convergence of alternative perspectives and approaches on a single conclusion increases confidence about that conclusion and understanding of the particular phenomena that underlie it, while divergence of conclusions across perspectives and approaches identifies limits or qualifications of phenomena.

As we discuss different approaches to research throughout this book, it is important to recognize that much of research attempts to draw inferences about phenomena – be they sub-microscopic or societal. Regardless of the approach taken, an important goal is to understand social and other phenomena, and to identify variables that can create and/or explain changes in other variables. Understanding has been central to scientific methods throughout history. Even when research was primarily descriptive (in what has been called the **pre-positivist** era; see, e.g., Lincoln & Guba, 1985), the goal still was to observe and understand. Attempts to increase understanding underlie the array of methods that are described in this book. When researchers developed what is sometimes called a **positivist approach** to science and research, they moved from description to active attempts to change outcomes. As science became more active, research findings were used to generate approaches for doing things like creating change, improving lives, and increasing safety and security. After World War II, research changed to view multiple theories being possible in a single setting, and viewed theories as provisional until more refined theories challenged or replaced them. Sometimes this perspective is called **post-positivism**, but the basic "scientific" approach and search for generalizable laws still predominated. (To recognize this shift, we will use the term *positivist/post-positivist* to describe these approaches, which still are dominant.) But the search for generalizable **causal laws** that explain and predict events and that develop interventions to create change and modify outcomes (e.g., social engineering) is not universally held as desirable. Other researchers, called by some **post-positivists** (see, e.g., Lincoln & Guba, 1985) but also called **constructivists or interpretivists** (e.g., Mackenzie & Knipe, 2006), argue that seeking general causal laws is misleading and ultimately will be unsuccessful, for a focus on prediction and control narrows science and decreases its capacity to describe and explain behavior. To lessen confusion, we will refer to that set of approaches as *constructivists*. Among their arguments against positivism are that positivists are:

- *deterministic*, ignoring free will and not recognizing that realities are multiple and constructed;
- *reductionist*, because not all behaviors follow a single set of laws and because positivists attempt to assign causal direction to a complex state in which mutual simultaneous "shaping" is occurring;

- *egocentric*, for researchers often impose their personal reality on situations and participants;
- *dehumanizing* for subjects; and
- *obtrusive and imprecise*, inadequately accounting for the impacts of researchers on their subjects and settings.

Constructivists argue for approaches that are inferential but that develop understandings that include probabilistic and speculative judgments and that are built upon perspectives of the research participants, and they focus work at the local level (e.g., Lincoln & Guba, 1985). Building upon perspectives of the participants rather than coming to the setting with a priori ideas about how things operate explains the terms constructivist and interpretivist. Researchers develop theory or patterns of meaning from participants as they collect data (e.g., Mackenzie & Knipe, 2006).

The approach we are taking to this book is largely what we above have called positivist/post-positivist, for the methods that traditionally have provided content for *Research Methods in Social Relations* (RMSR) are those developed from traditional scientific and related approaches. At the same time, however, RMSR across its various editions has consistently addressed issues that have been viewed as shortcomings of such research:

- sharing responsibility and control of research processes through action research;
- recognizing researcher values;
- respecting research participants; and
- examining the importance of situational factors, of the diverse perspectives that exist in any setting, of the applicability of research findings in real-world settings, and of the obtrusive impacts of researchers on their participants.

Some of the newer sections of this edition of RMSR blend methods used by constructivist researchers with more traditional positivist/post-positivist methods. But our approach is pragmatic, articulating the perspectives underlying different techniques and avoiding identifying approaches as used only by particular types of researchers, for that might limit the methods researchers believe they are supposed to be using. We attempt to present strengths of the different methods and how they are used without taking a position about which approaches might be "best." We don't believe that researchers should be defined as of a single orientation and type, for, as noted above, regardless of approach, all research methods seek to improve understandings and capacity to draw inferences. And **mixed methods** (a new chapter in this edition) provide researchers with richer data that help them to draw more accurate inferences. The methods throughout this book provide various complementary ways of developing understandings and of improving capacity to draw inferences. (At the same time, however, we recognize that our approach may at some points inadvertently adopt positivist/post-positivist orientations, for that is how we were trained.)

In this opening chapter, we describe how social and behavioral sciences[1] are similar to and different from two other ways of knowing with which readers already are

[1] Throughout the book we use social science to include behavioral sciences as well as social sciences. Only in this paragraph do we use both descriptors.

familiar: the physical sciences and casual observation. The social and behavioral sciences (e.g., anthropology, psychology, sociology, economics) are similar to the physical sciences (e.g., physics, chemistry) in the logic of inquiry but different in the degree to which the objects (or participants) under observation play an active role in the inquiry. Life sciences (e.g., biology) fall in between, in some instances being more like the physical sciences, in others more like the social sciences dealing with participants. Participants force researchers to consider questions about social and ethical values. The social and behavioral sciences are similar to casual observation in the quest to understand how people behave and relate to each other, but they are different in their rigor and in the systematic methods used for inquiry.

We address two major themes in the remainder of this chapter. The first concerns the place of values in social science research. Social scientists can borrow the logic of the physical sciences but must make use of different methods because the "things" we study are not inert objects but sentient beings engaged in complex social behavior. When we study social behavior involving individuals or groups of people, we encounter their reactions to us as observers/researchers. They, as we, are formulating hypotheses about the setting and what is happening, and their hypotheses may affect ours. In addition, in formulating our hypotheses, we are expressing our values and perspectives, which raise value-laden questions about research. The physical sciences also are not value free, as Einstein pointed out when he discovered the formula for nuclear energy, but the place and prominence of values are more immediately apparent in the social sciences. Also, in research with human subjects, reactions of the observed to the observer or participant to researcher must be taken into account.

The second major theme in this chapter compares the social sciences and casual observation as ways of knowing about and explaining social behavior. As addressed in the beginning of this chapter, examining social behavior scientifically sometimes appears to be "common sense" because most people try to make sense of social behavior daily using processes of casual observation and action. This chapter explains in detail how the social sciences differ from casual observation (sometimes called **naïve psychology**) in their deliberate search for sources of bias or invalidity.

Perspective

Gazing down at people from a tall building or a window of a low-flying airplane gives us a different view of humanity from the embedded perspective with which we are accustomed. A crowded park or congested freeway feels different when we look at the crowds from afar. Somehow the distance gives us a sense of objectivity: We can observe without feeling the congestion ourselves. And it gives us a bigger perspective than we typically have within settings, where we can see only part of what is happening. At the same time, much would be missed if we always observed from afar. We would miss the feelings, the excitement, and the crush and enthusiasm of the crowd if we never entered into it ourselves, and we would not be aware of the many differences among individuals within the social setting. Social scientists observe people and settings from various distances because differing vantage points provide different information – about how people feel, act, and interact, and about contextual variables. Confining ourselves as social scientists to a single method or procedure limits what

we can know. No one procedure or method can provide a complete description. Some research methods allow the observer to be a participant in the group that is being observed. Other methods enable the observer to remain hidden or anonymous and to see from a distance. In this book, we describe these different methods in detail.

The Place of Values in Social Science Research

Values might seem to be an odd topic to feature so immediately in a methods text because research strives to be **objective**, namely, "not biased by someone's point of view." As noted in the prior discussion of positivistic and constructivistic approaches, however, the idea that research is value free or totally objective is a questionable and controversial one. That is not to say that research is designed to promote particular views or that many researchers have hidden intentions underlying their research. We believe that most researchers attempt to discover relationships as objectively as possible. At the same time, few researchers go into their research indifferent about possible findings, and many are likely to have strong expectations about which possible outcome is most plausible (and most desirable). Researchers have perspectives and **values**, which represent a point of view, a judgment that "this is good and that is bad," which someone else might dispute. Most importantly for this discussion, their values affect how they see things and what they expect. And they affect what researchers choose to study. Arguments about values often cannot be settled by scientific evidence because disputing parties are likely to interpret evidence as consistent with their perspective or discount evidence contrary to their perspective.

The inextricable connection between values and social science research requires researchers to be aware of the implications their research can have for human welfare. Even though they cannot separate themselves from value questions, they need to be aware of the values that are influencing the approach and the implications of those values for the welfare of various individuals and groups. This tension between objectivity and values is apparent in the case study of a controversial social science study presented in Table 1.1. Using procedures described in Chapter 17 of this book, Rind, Tromovitch, and Bauserman (1998) concluded that victims of childhood sexual abuse do not suffer long-term harm, a conclusion that stands in stark contrast to values held strongly by many members of the public and many victimized by childhood sexual abuse. As detailed in Table 1.1, the published research report received considerable negative attention in the popular press and ultimately was unanimously condemned by both houses of Congress. Other examples of negative attention, including ones in the digital age, can be found in Sleek (2013).

Rind et al.'s (1998) study first illustrates that social science research on an issue of great public interest can attract substantial public attention. It also illustrates the challenges of conducting research that addresses important social issues. On the one hand, it is important to know what the impacts are of social phenomena like childhood sexual abuse. On the other hand, if the results turn out to be inconsistent with widely held public opinion, skepticism about the findings should be considered and perhaps even anticipated. And in this case, individuals who perceived themselves as being victimized by abuse potentially could feel that their credibility and even identity had

Table 1.1 Case Study of When Science Clashes with Values: The Rind et al. (1998) Meta-Analysis

In 1998, *Psychological Bulletin*, the premier review journal in the field of psychology, published a meta-analysis of the long-term psychological outcomes of having been sexually abused as a child (Rind, Tromovitch, & Bauserman, 1998). A meta-analysis is a quantitative synthesis or literature review that summarizes a group of studies all bearing on the same topic (see Chapter 17). In their meta-analysis, Rind et al. summarized 59 studies examining the association between psychopathology and childhood sexual abuse history in college students. Somewhat counterintuitively, they discovered that having been abused as a child was only weakly associated with later maladjustment. Moreover, the association between abuse and later psychopathology was even smaller when the abuse was deemed consensual by the victim. Perhaps their most controversial finding was that non-negligible proportions of the samples (11% of women and 37% of men) reported retroactively that their immediate response to the abuse had been positive.

Rind and his colleagues were very careful in their report to state, repeatedly, that the lack of demonstrated long-term negative outcomes for childhood sexual abuse *did not mean* that sexual abuse was acceptable or not immoral. Despite their careful caveats, their paper provoked an intensely negative reaction from the public, who interpreted the findings to mean that the authors were endorsing pedophilia and other forms of childhood sexual abuse. Criticisms of the research findings circulating on the web eventually found their way to Dr. Laura Schlessinger, a media personality whose talk show attracts millions of listeners. After Schlessinger criticized the Rind et al. paper as "junk science" on her show for two consecutive days and generated countless irate phone calls and letters, Congress became involved. Several members of Congress held a press conference demanding that the American Psychological Association (APA; the organization that publishes *Psychological Bulletin*) denounce the Rind meta-analysis and calling for a congressional resolution condemning the study.

Two months of intense public pressure ensued, and ultimately the president of APA wrote a letter to the U.S. House representative who was leading the condemnation campaign. This letter stated that (1) findings reported by Rind et al. were inconsistent with the APA's stated and deeply held positions; (2) the editors should have evaluated the Rind et al. research report based on its potential for affecting public policy and would take such implications into account when reviewing future research reports; and (3) the APA would seek an independent review of the article by a panel of outside experts.

Even these concessions were not enough for Congress, and in July, the House of Representatives voted 355 to 0 (with 13 abstentions) to condemn the Rind et al. meta-analysis. This resolution was passed unanimously two weeks later by the Senate.

been undermined by the findings, which would produce anger about the research. Further, contrary to a view of research that separates researchers from their findings, social processes used in everyday life (the **covariation principle**) would associate researchers with their findings, so they may find that despite their intentions to be "dispassionate" researchers conducting the research, they become identified with the findings and the targets of anger.

When viewed from a research methods perspective, issues that would arise in reviewing the article are what Campbell and Stanley (1963) called **threats to validity** – things like: were variables operationalized inappropriately, were data coded incorrectly, were analyses misinterpreted, were incorrect inferences drawn, and so forth. (These issues will of course be covered later in this text.) Researchers surprised by the findings would examine them in detail to see whether they stand up to scrutiny, and they would replicate and extend them using an array of different methods. In thinking about various methodological approaches, in this particular instance, the findings likely were contrary to findings that would have been produced by case study methodologies, which almost certainly would identify individuals who would be able to explain in great detail the harmful effects of the abuse they had experienced. The research can be seen as illustrating that science uses its methods in self-correcting ways, with other researchers reanalyzing, replicating using different as well as similar approaches, and eventually supporting, qualifying, or countering the findings.

Of equal importance is the point that the major professional organization of a discipline was influenced by public reaction and public beliefs and values in its determination of whether a research report should be published. That approach leads to suppression of free scientific inquiry and even censorship of unpopular research. It would be tragic for science if values were to become a justification for preventing important research questions from being asked or for results to be suppressed simply because they convey findings that some people find personally repugnant. As a sidebar, researchers can be at the mercy of the popular press in its depiction of findings. It is distressing that the public media distorted the findings, feeding the public reaction to the research. Finally, returning to the topic – values – the example illustrates the ways that values affect the questions we ask and how we react to what we find.

In sharp contrast to the Rind et al. (1998) research on the effects of childhood sexual abuse, the values in some areas of research are uncontroversial. For instance, a large body of research exists in the field of cognitive psychology on the concept of "natural categories." It shows that people use preferred or basic levels of categorization in perceiving objects and in how they approach and structure their worlds. For example, people first categorize an object they sit in as a "chair," rather than using a more specific ("desk chair") or global ("furniture") category (Rosch, 1988). Natural categories are regarded as providing helpful ways of navigating the overwhelming mass of stimuli that confronts individuals in everyday life.

Research on racial categories, however, has produced observations that evoke values. Although there is little controversy if people use categories to make inferences about pieces of furniture, there is a negative reaction when racial categories (stereotypes) are used to make inferences about individual members of those categories. Indeed, the impact of values is evident even in the title of a research report on racial categories, which begins with the clause: "Just Say No (to Stereotyping)…" (Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000). In short, stereotyping is viewed as acceptable and even helpful when the stereotypes are categories referring to physical objects; when *people* are stereotyped, however, it is viewed as unacceptable. What makes racial category research more controversial than research on furniture categories is the interpretation of the data. The observations or "facts" in both cases are

quite straightforward; it is the interpretation that introduces social and political beliefs and values.

The act of framing a question about social behavior also encompasses values, beliefs, and perspectives. For instance, many studies ask, "What are the effects of maternal employment on child development?" but few ask about the effects of paternal employment. Is this asymmetry neutral or does it reflect cultural beliefs and values? Consider another example: In the past there were many studies designed to investigate the "causes" of homosexuality, but few investigating the "causes" of heterosexuality. (*Causes* is in quotation marks because this research typically is correlational, and can only identify relationships rather than causes.) The act of asking a question and framing it, with both an implied answer and an implicit set of values about social behavior, is rarely neutral.

Thus, values can directly influence the type of social science research that is and is not done. Sometimes this influence is positive, as when scientists use their tools to address important issues facing society, for example, struggling intensely to discover a vaccine for HIV/AIDS; ways to prevent birth defects, reduce crime, prevent wars, and lessen intergroup conflicts; or interventions to increase the academic success of at-risk youth. Unfortunately, sometimes values can have a chilling effect on science. Morton Hunt (1999) observed that in the preceding 15 years there was a dramatic increase in the public's efforts to impose limits on the freedom of social scientists to investigate potentially controversial questions. For example, in 1991 an $18 million grant that had already been awarded to researchers to examine sexual behavior in adolescents that placed them at risk for HIV infection was abruptly canceled mere weeks before the project was to begin because of public and congressional pressure on the grounds that it was inappropriate to ask teenagers sensitive questions about sexual practices. Unfortunately, the consequence of this action is that we now know less than we could have known about practices in which teenagers engage that endanger their lives; thus, we are less equipped to intervene and decrease the incidence of a fatal disease.

Contestability in Social and Physical Sciences

Readers who have taken a laboratory course in the life or physical sciences probably remember white laboratory coats and physical equipment that convey the message, "This is serious; this is science." The dissection tools, microscopes, titration jars, eye goggles, and other uncommon instruments make it clear that this is no ordinary way of comprehending the world and that special approaches are required to do the work. This is what people think of when they think of science, and it promises to reveal information far different from that gotten from casual observation, which requires no such tools.

In contrast, the typical first exposure to the social sciences seems much more like casual observation. Usually there are no lab coats or uncommon instruments, and consequently little sense of the mystery and importance that can be engendered by such objects. For example, imagine that someone read that day care centers in the

United States or communal childcare in Israel create self-reliant and sociable children. If that person was not opposed to the idea that mothers of young children can work and their children can thrive, he or she might have believed the results were true; however, if the person believed that mothers of young children should stay home, it would be *relatively* easy to find apparent fault with the research and conclude that the results were erroneous. The results of social science research appear to be more contestable than the results of research in the physical sciences.

We are not suggesting that the physical sciences lack ambiguity. The debate over the existence of cold fusion or dark matter shows that physical scientists are just as capable as social scientists of debating the mere existence of a phenomenon. Even electron microscopes and other sophisticated methods of observation have ambiguity and error. Nevertheless, for the general public, the results of social science research often appear to be more contestable than the results of physical sciences research. It may be because we naturally develop ideas about things like parenting, while dark matter or cold fusion seem far removed from everyday life.

What makes social science research seem more contestable? Few people would say, "Amoebas do not reproduce by dividing in half! They reproduce just like dogs and cats; I don't care what you say with your fancy microscopes!" Such statements simply do not correspond with well-established and observable reality. In contrast, a fair number of people might say, "Children of working mothers do not develop as well as children whose mothers stay home! I don't care what you say with your fancy surveys!" In making such assertions, people dispute/contest findings. Some may think of others they know who "prove" what they say, not realizing that individual cases do not rebut patterns that appear across samples of individuals. Others, however, may have more substantial reasons for disagreeing, pointing to things like wording of items or sampling that could predispose respondents to particular answers.

We do not oppose argumentation and debate; they are essential for a science, physical as well as social, to grow and test itself. The point here, however, is that the public tends to accept observations made by physical scientists but less readily accepts those made by social scientists.

Two features of social science research leave it susceptible to differing interpretations. One is the seemingly ordinary quality of most methods. Instead of using dissection kits or electron microscopes, most social scientists use their unadorned eyes and ears to gather their data. They ask people questions, listen to their answers, and observe their behaviors. In the following chapters we show that the methods used by social scientists differ in significant ways from casual observation; the requirements imposed on measuring techniques are stringent and far from casual. For now, however, we wish to point out that, to the public, the methods commonly used by social scientists may appear to be informal and unimpressive, no different from the methods they use in everyday life, and therefore the conclusions seem contestable.

The second feature that makes the results of social science research seem more contestable is that they often address issues about which there are serious, deeply felt, politically identifiable differences of opinion. It is, therefore, difficult for researchers to persuade someone that they have observed "the facts" when those facts contradict the person's beliefs, values, or political interpretations, and is made even more so in situations where other social scientists report research supporting contradictory views.

For instance, someone who believes mothers should stay home with young children might not be dissuaded by social science research. The prior belief is deeply rooted in the person's beliefs about men and women, about family, about power, and perhaps about religion. The case study of the Rind et al. (1998) meta-analysis is an excellent example of what happens when conclusions from social science research contradict people's very strongly held beliefs (and other social science research).

Exercise: Is research value free?

Because social science research is an investigation of relations between people rather than between objects, it can never (or hardly ever) be value free. We qualify this statement to say "hardly ever" and allow the possibility that some social research might be value free. Think of examples where values have shaped research, and see whether you can think of any example in which the argument could be made that the research is value free. Readers, in reaching their own conclusions, probably will create some very convincing cases that also show how much values come into play in social science research.

We do not want to leave the impression that physical sciences are "really" scientific and social sciences are not. Rather, we want to evoke an appreciation for the features of social science research that make it particularly challenging. Research in the social sciences has many similarities with other forms of research. This book contains language that is technical and teaches methods that are not simple and that are used across life and physical sciences. And if sheer difficulty and complexity were qualifications for being considered "scientific," the social sciences would be high on the scientific ladder, for they try to understand behaviors of complex beings acting in social settings with many changing situational and contextual variables. Nevertheless, because the research is usually embedded in a set of social and political values, results that contradict values elicit emotional as well as cognitive reactions. And, unlike physical sciences, the work is not protected by an aura of respectability, if not reverence, because the research sometimes looks like casual observation.

Casual Observation

As was discussed briefly earlier in this chapter, the study of social behavior is the study of how people behave with and toward others. Defined broadly in this way, we are all social scientists. To see this, imagine a party on a weekend evening. We all have expectations about how people at a party are likely to behave and not likely to behave, as well as when we expect differences across individuals. A party attended by a 20-year-old likely will be different from a party attended by a 50-year-old. Not only do we have expectations about people's behavior at the party, but we also are likely to have explanations for at least some of this behavior. Suppose we saw someone at

the party spill a drink on someone else. At least implicitly, we would look around to figure out why the drink was spilled. Was the accident not an accident at all but rather intended? Did it occur because the drinker already had one too many drinks? Was the party too crowded, with the inevitable jostling when too many people are jammed into a small room?

Consider another example: A family is sitting in their apartment when they hear someone shout in a loud voice, "I'm going to kill you!" from the next apartment. Because this is not expected behavior, more or less automatically the family tries to figure out what is going on. That is, they try to find explanations for the behavior they are observing. Is this a serious argument? Is someone in genuine risk of being injured? Or is it merely the kind of joking threat family members are prone to make to one another? Should the family call the police or mind their own business? The family might try to gather more information to arrive at a conclusion, for example, by pressing their ears against the wall to try to hear other parts of the conversation that would clarify the nature of the threatening remark.

As each example illustrates, we are all naïve observers or students of social behavior, regardless of what our actual professions are. That is, we are all engaged daily in the ordinary pursuit of understanding social behavior because we have expectations, hunches, and hypotheses about how people are likely to behave in given situations and why they behave as they do. For instance, we expect certain behaviors at a party and not others. When someone spills a drink, we try to figure out what caused that behavior. The expectations, hunches, or hypotheses of **casual observation** are ultimately utilitarian. If we have ideas about how others are likely to behave in different situations and in response to our own behavior, we can act in ways that elicit desired behaviors from them. Casual observation of social behavior is useful for planning our own behaviors to reach our goals, objectives, or desired outcomes.

This discussion does not imply that our ordinary hunches and hypotheses about others' behaviors are necessarily right. Some expectations about behavior are violated, even routinely. For instance, we might think it inappropriate to have too much to drink at a party. Nevertheless, someone might do just that. Likewise, when driving a car we expect others to look for oncoming cars before making a left turn. Nevertheless, people sometimes turn left in front of approaching traffic.

Not only can our expectations about how others are likely to behave be wrong, our explanations for why they behave as they do can also be wrong. For instance, after seeing someone at a party spill a drink, we might surmise that the accident was caused by clumsiness. This explanation might well be in error; perhaps the spill was intentional and in retaliation against someone who had been insulting. If we hadn't seen or heard about that prior insult, our explanation for the behavior could not be based on it. Similarly, if we hear a threatening shout from a neighboring apartment, we might conclude that it is just a minor argument, and as a result we might not realize a serious crime is about to be committed.

Because our ordinary hunches, hypotheses, and explanations ultimately are constructed to help us achieve our own goals and control our world, and because we must inevitably realize that our hunches are not always correct, part of casual observation involves trying to figure out when our hunches, hypotheses, and explanations are right and when they are wrong. Therefore, two elements characterize our casual observa-

tion of social behavior. First, we have hunches and hypotheses about others' behavior. Second, we continue to examine, at least somewhat critically, those hunches and hypotheses. We are motivated both to explain others' behaviors and to figure out whether our explanations are correct. We do both routinely and spontaneously, hardly ever bothering to reflect on the fact that we are in fact studying social behavior.

The same two elements also characterize scientific studies of social behavior, regardless of whether the studies are conducted by researchers from psychology, sociology, political science, public health, education, economics, or business. They all share the goals of constructing theories of human social behavior and critically examining those theories to improve their accuracy.

The goal of this book is to provide an introduction to the methods commonly used by social scientists to study human social behavior and social relations, which encompass a wide range of behaviors and social settings. It covers the methods used to construct scientific theories of social behavior. We first examine how people operate as casual observers of social behavior – routinely using "naïve" methods in constructing and critically evaluating hunches and hypotheses about human social behavior. Then "naïve methods" are compared and contrasted with those that characterize a scientific approach to the same phenomena.

Naïve Hypotheses and Theories of Social Behavior

Most aphorisms or clichés about human social behavior are **naïve hypotheses:**

Birds of a feather flock together.
Absence makes the heart grow fonder.
The early bird gets the worm.

Each of these naïve hypotheses has a characteristic form that is seen most clearly if reduced to its basic meaning:

Similarity results in increased contact.
Absence results in increased attraction.
Immediate action on opportunities results in success.

Each of these naïve hypotheses argues that one phenomenon or behavior – the subject in the sentence – causes or is associated with another phenomenon or behavior – the object. These phenomena, both subject and object, are called constructs. A **construct** is an abstract concept that we would like to measure. Love, intelligence, aggression, self-esteem, and success are all constructs. Although these things are real and affect our lives in many different ways, they do not exist as physical objects. We cannot go down to our local supermarket and pick up a six-pack of love, as much as we might like to. Instead, we can only measure constructs indirectly and imperfectly through an operational definition. The **operational definition** of a construct is the set of procedures we use to measure or manipulate it. For example, one operational definition of intelligence is a person's score on a standardized IQ test. The

operational definition of aggression might be the number of electric shocks a participant chooses to deliver to another person. Chapters 2 and 5 address the complex issues of operationally defining a construct and how we determine whether our operational definitions of a construct are correct, or valid.

A social science **hypothesis**, naïve or not, is a falsifiable statement of the association between two or more constructs that have to do with human behavior. These hypothesized associations might or might not be causal. They can state that one construct causes another, or they might simply state that one construct tends to be found with (related to, associated with) another. There are two notions that require elaboration: the notion of constructs and the notion of what is a causal association.

When a hypothesis concerns **causal associations**, some constructs are identified as causes and others as effects. If we believe that the three naïve hypotheses presented earlier are causal, the causal constructs are similarity, absence, and immediate action. The three affected constructs – the effects – are contact, affection, and success. Notice that all these constructs, whether involved in a hypothesized causal association or not, concern general phenomena having to do with social behavior, and they all require further definition or elaboration. What, for instance, is success? Because success is a construct and does not exist physically, it can mean different things to different people. Success for one person might mean having good friends, whereas for someone else it might mean having money or status. And because constructs do not exist physically, they need further definitions tied to actual observable behaviors. To create their definitions, scientists observe and try to identify various ways of defining or measuring success (e.g., someone's stated quality of friendships or someone's average yearly income).

Our naïve hypotheses frequently concern causal associations among constructs. Most of us believe that behaviors have causes and that we can determine at least some of those causes. We also believe that success is not entirely the result of luck or good fortune or random events. Rather, we accept the notion that success is partly affected by activities or constructs like immediate action. Likewise, in arguing that similarity results in contact between people, we implicitly acknowledge that our choice of friends is not random; rather, some phenomena or constructs cause us to like or dislike others. Naïve hypotheses by their very nature imply that human behavior is partially determined or caused. At the same time, we also believe that human behavior occurs as a result of random events, luck, and individual whims. Using the language of Kurt Lewin, behavior is a function of the person *and* the environment.

Hypotheses vary not only in whether they describe a causal association but also in the complexity of the association they describe. Some hypotheses can be linked with other hypotheses to make up a theory. A **theory** is a set of interrelated hypotheses that is used to explain a phenomenon (e.g., attraction, success) and make predictions about associations among constructs relevant to the phenomenon. For instance, the following set of hypotheses forms a small theory. Like many such sets, it takes the form of a syllogism:

Being unemployed frequently leads to personal depression.
Depression is often a cause of divorce.

Therefore, increased unemployment in society is associated with higher divorce rates.

This syllogism consists of three hypotheses, the third being logically inferred from the other two. Some theories of social behavior can be as simple as this, linking a few hypotheses. Others are exceedingly complex, linking many more hypotheses. For instance, some of the founding documents of the United States, such as the Declaration of Independence, set forth relatively complex theories about the conditions under which people will be happy and will prosper.

Hypotheses vary in complexity not only by being linked with others in theories but also by bringing in qualifying conditions or constructs that must be met for the hypotheses to be applicable. For instance, someone might hypothesize that "absence makes the heart grow fonder" holds true only when the absent target is an individual to whom the holder has a romantic attraction. This qualifying condition makes the hypothesis more complex than the original one. Now, instead of maintaining simply that one construct leads to another, the hypothesis states that construct A results in construct B only under condition C.

There is one very common form of qualifying condition that we often add to hypotheses: We frequently specify a group or kind of person for which a hypothesized causal effect should hold. For instance, we might say, "Among individuals actively seeking a job, unemployment increases the probability of personal depression." We have then added a qualifying condition that specifies the group or population for whom the hypothesis is expected to be true. Adding such a condition suggests by implication that the hypothesis might not hold for other groups or populations. Because people having different backgrounds and experiences often behave differently, it is important to increase precision of hypotheses, which also increases the complexity of a hypothesis by adding conditions that specify the population or populations for which the hypothesis should hold.

In addition to varying in whether they describe a causal association and in complexity, hypotheses differ in how confidently they are held or maintained. We might, for instance, firmly believe that being unemployed can cause a person to be depressed. We might feel less strongly, however, about whether personal depression is a cause of divorce. Because theories are made up of sets of hypotheses, often in syllogistic form, and because these hypotheses differ in the confidence with which they are held, the syllogistic conclusion of the theory as a whole ought to be held with no more confidence than the least confident premise. One might even argue that confidence combines multiplicatively, typically yielding lower confidence than the least confident premise. Whether this is in fact how we operate in our casual observation of social behavior, however, is open to question.

So far we have discussed the nature of hypotheses, that is, the form they take and ways in which they vary. Once confidence is considered, we must raise the second question that was posed earlier about our casual observation of social behavior. Why are some hypotheses held with more confidence than others? To answer this question, we must know how people ordinarily gather evidence to test hypotheses.

Sources of Support for Naïve Hypotheses Underlying Casual Observation

At least five sources or types of support are routinely used to develop and modify naïve hypotheses and theories: (1) logical analysis, (2) authority, (3) consensus, (4) observation, and (5) past experience. Each of these sources suffers from at least some weaknesses that make its reliability suspect.

Logical Analysis

We often derive hypotheses and decide whether they are accurate by examining whether they are logically consistent with other hypotheses that we hold. An example of such **logical analysis** is contained in the syllogism presented previously. If we take it to be true that unemployment frequently leads to personal depression, and if we take it to be true that personal depression can often lead to marital discord and divorce, then it necessarily follows that unemployment increases the chance of divorce. This final hypothesis is deduced, or logically inferred, from the combination of the two earlier ones. Schematically, we can represent the syllogism this way:

Being unemployed → depression → divorce

As this illustration makes clear, the influence of unemployment on the probability of divorce follows from the intervening or mediating or transmitting role played by depression in the process.

Syllogistic reasoning is frequently used to derive and modify hypotheses based on their consistency with other hypotheses. Generating support for hypotheses by such reasoning, however, is not without its pitfalls. Alan Cromer (1993) argued in his book, *Uncommon Sense: The Heretical Nature of Science*, that the human brain is not wired for the type of logical thought required for science and that instead people hold the mistaken belief that they have intuitive knowledge about the way the world works. The problem is that our "intuition" and logical processes are often incorrect. Cromer gives the well-known physics example: If one were to fire a bullet from a gun straight across a field, while simultaneously dropping a bullet from the same height, which bullet would hit the ground first? Most people would say that the bullet being dropped would hit first, but the answer is that both bullets would hit the ground at the same time. Downward velocity is independent of horizontal velocity. This is elementary physics, but our intuitive reasoning could lead us to the wrong answer. Cromer argued that in order to think scientifically, we need to think in formal logical terms, and this is not something that comes naturally but rather must be taught.

In the social sciences, especially, what we ordinarily regard as a logical conclusion can be influenced not only by pure logic but also by our wishes or desires (Gilovich, 1991), for we have along with our rational and logical capacities tendencies to view the world in ways that would make good things happen to us, that make us look good, and that make the world conform to what we believe. For example, we might invent seemingly logical justifications for hypotheses that we hold simply because we wish these hypotheses to be true. Although we strive for logical consistency in many of

our beliefs, we also have a remarkable ability to ignore inconsistencies in other beliefs. For instance, it was not unusual in the 1950s to encounter White Americans who believed both that "anyone in this country can achieve whatever he or she wants" and that "Blacks should not be allowed to attend the same schools as Whites." Today some people believe that government should get out of people's lives and also that government should be able to tell women what they can and cannot do if they get pregnant or that the government should prevent same-sex couples from marrying. Others strongly believe that freedom of expression is important in a democratic society and yet also believe that people who have certain (e.g., bigoted) views should not be allowed to express them. And some people believe that the government should not be involved in health care – except for Medicare and Medicaid. When we want to ignore contradictions in our thinking, we have a remarkable capacity to do so, particularly when issues are complex.

Authority

We are likely to turn to various authorities or experts to determine what hypotheses make sense in our casual observation of social behavior. To figure out how to cope with a difficult child, a parent might consult an **authority** – a pediatrician, a counselor, or a teacher. To decide how to behave in a foreign country we have not visited before, we might consult someone who knows the country well. To understand why riots occur sometimes in some large cities in the summer, we might consult a sociologist or a specialist in issues of race and social class. As long as we have faith in the expert we consult, we might regard the expert's opinion as sufficient justification for a hypothesis.

Using experts to decide which are good hypotheses and which are not is efficient as long as they are indeed expert in the area under consideration. All too often, however, we presume someone to be an expert when he or she only has the trappings of expertise without the actual knowledge to back it up. We rely on the symbols of authority without making sure that the authority is truly knowledgeable (Cialdini, 2001). Another challenge of expert judgments is that experts often do not agree one with another, so our view might depend on the particular expert we consult.

In addition, we are inclined to let our beliefs and values define whom we identify as an expert, which occurs when we seek so-called experts merely to provide a confirmation for our hypotheses rather than a critical assessment. For instance, some might regard an astrologer as an expert on how to choose a spouse. Someone who defines the astrologer as an expert in this area is already convinced of the wisdom of astrological advice on such matters.

A final challenge that comes with reliance on authorities is that authorities can have their own personal interests at heart. Because authorities presumably like their status and position, they might provide advice that perpetuates or justifies the status quo rather than advocating for change. If we wanted to arrive at a solution for our energy problems, the answers we probably would receive from diverse authorities would be likely to differ simply as a result of the positions these authorities occupy. For instance, if we were to ask the chief executive officer of a major oil company, it is unlikely that

this person would argue for immediate replacement of or dramatic curtailment of the use of fossil fuels.

In sum, in our casual observation of social behavior, we seek input from authorities to help us evaluate our hypotheses and theories. Just as relying on logical analysis is not without pitfalls, so, too, relying on the wisdom of authorities can lead to biased conclusions.

Consensus

Instead of appealing to the wisdom of authorities, we might appeal to the wisdom of our peers, seeking **consensus** regarding our hypotheses. In part, we decide what are good or bad beliefs or hypotheses by finding out what our friends think about them and whether they agree with us. How might a mother decide when to wean a child? She might appeal to a physician as an authority. It is equally likely, however, that she will ask her friends when they weaned their infants. If a client of our business makes an unreasonable request, we might ask our coworkers why the client acted that way and how we should respond. If we want to evaluate our opinions regarding why high school graduates are not ready for college or why college costs have gone up so much, we might discuss it with our neighbors. All these examples illustrate processes of validating our hypotheses or theories by consensus with peers.

Seeking peer support for hypotheses is not a great deal different from the use of authorities. In both cases, others help us decide what we should and should not believe. As a result, consensus is subject to the same kinds of biases and distortions as is consultation with authorities. With which of our peers will we discuss our ideas on schools? Most probably the discussion will be with people similar to us who are quite likely to agree with us on such things.

In addition, groups of people can be notoriously poor as independent judges. Groups frequently are pushed toward unanimity so that dissenting voices are not heard or are forced to change their publicly espoused views (Janis, 1997). Also, the group might tell the listener what he or she wants to hear, especially if the listener is highly regarded or a person of authority. As a result, group consensus is often inadequate for validating hypotheses. In our casual observation of social behavior, however, we sometimes rely on it heavily.

Observation

To determine whether our naïve hypotheses are correct, we routinely compare them to our own and others' behaviors through **observation**. When our hypotheses are not consistent with what we observe, we might modify or abandon them. Suppose we believe that women are able to "read" nonverbal messages more clearly than men (Hall, Carter, & Horgan, 2000). That is, we think that women are more sensitive in understanding nonverbal signals that are sent to them, intentionally or not. To determine whether this hypothesis is accurate, we might watch members of both sexes in a number of different settings. If we are serious enough about examining our hypothesis, we might even do an informal experiment. For instance, we might try

to communicate nonverbally with some female and some male acquaintances and then see who figures out our signals more clearly.

Consider another example. Suppose we believe that prejudice toward other ethnic groups is caused by a lack of personal acquaintance with members of those groups. To learn whether this hypothesis is accurate, we might conduct some informal interviews with various acquaintances, asking about their friendships with members of various ethnic groups. We might then see whether our estimates of each person's degree of prejudice toward each group seem to be (negatively) related to the number of friendships he or she has.

Observational procedures are as full of pitfalls as are other procedures used to support our naïve hypotheses. There are four major problems in using observation to validate hypotheses. We can use the example in the preceding paragraph to illustrate them. First, as we argued in defining hypotheses and theories, the constructs mentioned in a hypothesis (e.g., prejudice or personal acquaintance) can mean different things to different people. One person's impression of an individual's prejudice might not be the same as someone else's because different observers might look for different things. Similarly, what one person means by personal friendships with members of different ethnic groups might be different from what another person means. Hence, we might inadvertently decide to observe behaviors that do not represent or capture the constructs about which our hypothesis is concerned. In the same way, when interviewing individuals about friendships, we might find out how much they desire friendships instead of measuring their actual friendships.

Second, inferring that one construct causes another can be very difficult. Suppose, for example, that we hypothesized and found that people who are married are happier. Such a finding does not necessarily mean that differences in marital status cause differences in happiness. It is also plausible that the causal effects go in the opposite direction: that those individuals who are happier people are more likely to be married because their happiness makes them more attractive. Using observation to support hypotheses can be misleading because causal direction can be very difficult to establish – thus the common statement, "correlation does not imply causation."

Third, we might make our observations on a very select group of people, a group of people, perhaps, for which the hypothesis might be especially true but one that is not representative of the world at large. For instance, although it might be true that prejudice and contact with members of ethnic groups are associated in our select sample of friends, the two variables might not be associated in general or in other samples. Biased sampling could result in us having more or less confidence in our hypothesis than we should.

Fourth, we probably are biased in deciding which observations are relevant. Trope and Ferguson (2000), for instance, have written that when testing hypotheses about individuals, people look for instances that confirm those hypotheses and tend to ignore instances not consistent with them. Thus, the very process of collecting observational data can be biased. Just as we might choose authorities who tend to confirm our hypotheses, so, too, we might judge observations as relevant or not depending in part on whether they support our hypotheses. This phenomenon has been described as "we see what we are prepared to see."

Past Experience

We frequently and regularly generate support for our hypotheses as casual observers of social behavior by reflecting on or remembering past experiences. We think back to instances or events that confirm the hypothesis, and attempt to make modifications to take into account disconfirming instances.

Although the use of past experience is sensible and logical, it is susceptible to all the dangers inherent in the use of observation, plus others. Memory is inherently reconstructive. We do not passively store information about past experiences; rather, we store and organize events selectively. Theories and hypotheses are tools that we use in organizing our memories. It has been repeatedly shown that information consistent with a theory or expectation is more easily remembered than information that is irrelevant (Hirt, 1990). Hence, it is perhaps unlikely that hypotheses will be disconfirmed by recollected experiences.

Exercise: Types of support for reasoning

The text just described five sources of support routinely used to develop and modify naïve hypotheses and theories. They each are rooted in casual observation: (1) logical analysis, (2) authority, (3) consensus, (4) observation, and (5) past experience.

1. Imagine that you have decided to buy a new car (or new bicycle or computer). How do you use each of the five types? Feel free to use media or any other source in discussing the different sources.
2. If you were to make the same decision scientifically, how might you modify the approaches that you mentioned above?

Toward a Science of Social Behavior

Try as we might to obtain an accurate understanding of social behavior, we encounter innumerable difficulties in constructing and validating hypotheses and theories in everyday life. Acquiring accurate knowledge about how people behave and why people behave as they do is not easy. Yet we persist. So, too, does the scientist of social behavior, regardless of discipline or problem studied. Although the scientist's path toward acquiring knowledge about social behavior is in many ways just as hazardous and difficult as the path of the casual observer, there are differences in how they proceed. In the remainder of this chapter, we identify some of these differences, most of which are differences of degree rather than of kind. That is, scientists differ from the casual observers not so much in *what* they do as in *how* they do it. The scientific study of social behavior and the casual observation of social behavior engage similar

processes, and the differences between them can be subtle and, at times, even difficult to identify. Differences are nonetheless present.

The most important difference concerns the extent to which scientific studies are on the alert for biased conclusions. Scientists ideally operate as if their hypotheses and conclusions about human behavior might be in error. They look for biases and pitfalls in the processes used to support and validate hypotheses. Scientists are aware of the research on such biases and submit their conclusions to the scrutiny of other scientists, who attempt to find biases that were overlooked. In contrast, casual observers, although striving to be as accurate as possible in reaching their conclusions, often gather evidence in support of hypotheses without being aware of or worried about the biases inherent in the process. Although scientists are on the lookout for biases, they also are not aware of them all, which makes the difference one of degree rather than of "do and don't." The heart of the difference is this: The scientist systematically studies how to avoid biases in examining hypotheses, and uses an established set of methods for avoiding many such biases.

Unlike the casual observer, scientists engage in empirical research to try to determine whether hypotheses are accurate and how they need to be modified to make them more accurate. **Empirical research** is the collection of information through observation and other methods that is systematic in attempting to avoid biases. Although scientists might also use logical analysis, authorities, consensus, and past experience in evaluating hypotheses, unlike the casual observer, they must and do ultimately engage in empirical research. Scientists ultimately develop confidence in a hypothesis or a theory if it has been able to withstand empirical attempts to falsify it and if it can explain behavior in the "real world" beyond the research setting.

Because of this reliance on empirical research, social scientists tend to be more concerned about the problem of linking up theoretical constructs with observables than are casual observers. And social scientists also are more likely to be looking at relationships between the theoretical constructs rather than primarily between observable behaviors. A good scientific hypothesis contains statements about associations between constructs of interest and also statements about what observable indicators go with each construct. In other words, scientists who rely on empirical research are necessarily greatly concerned with how to measure or operationalize theoretical constructs. An ordinary observer using observation to support hypotheses is perhaps unlikely to spend much time thinking about what observable qualities indicate constructs of interest. Rather, the observer is more likely to think in terms of observable behaviors or signs, for those are the things occurring in everyday life that can be used to guide behavior.

To rely ultimately on empirical research to validate hypotheses means that social scientists assume that all constructs of interest can indeed be measured or observed. This is the assumption of **operationism**. For each construct of interest in the study of social behavior there must be observable features or manifestations that can be measured that represent the construct. This is not to say, of course, that scientists assume anything can be perfectly measured. In fact, they assume quite the contrary – that all constructs are measured with error, for it is very difficult to identify a measure that is exactly the theoretical variable of interest. Nevertheless, the scientific

assumption of operationism means that all constructs of interest can be measured, albeit imperfectly.

Earlier we argued that one of the characteristics of a scientific inquiry is that the scientist is constantly wary of biases in attempting to validate hypotheses. Ultimately this means that scientists can never actually accept a hypothesis as correct or accurate, for the observations that support it might have been biased or in error in unknown ways, or it may be that the hypothesis happens to be consistent with a different hypothesis that actually accounts for what has occurred. Strange as it might seem, scientists never can actually prove a hypothesis based on empirical research because that research could conceivably have been biased or the result could have been a chance event. The best scientists can do is to gather a large quantity of empirical evidence consistent with the hypothesis, while acknowledging that the hypothesis remains unproven in a formal sense because the evidence is, to an unknown degree, faulty. Although scientists of social behavior, like casual observers, are invested in their hypotheses and ultimately wish to support them, to function scientifically means that, regardless of the outcomes of empirical research, we can never accept hypotheses as absolutely true, but note that a body of evidence is consistent with a particular hypothesis.

Let us examine more closely the logic underlying that last statement. When researchers design studies, they are implicitly using the logical argument: "If Theory X is true, then Association Y should be observed." However, the converse does not hold: We cannot say, with confidence, that "Association Y was observed; therefore, Theory X is true." The logical snag is, as noted above, that there could be other reasons besides Theory X – say, Theory Z – for producing Association Y. If Association Y were *not* observed, that is clear evidence against Theory X and we can safely reject the theory. (In reality, scientists do not reject their theories so easily but instead would search for other reasons – inadequate measures or methodological flaws – for why Association Y was not observed.) In short, scientists talk of rejecting hypotheses and theories but not of proving them. We say that the results are "consistent with" or "support" a hypothesis but not that the hypothesis has been accepted. At best, hypotheses can withstand attempts to show that they are incorrect. There almost always are other explanations for a set of findings that seem to support a hypothesis, so a truly scientific stance is always a skeptical one.

What makes a scientific hypothesis a good one, then? A hypothesis gains gradual acceptance if it is repeatedly supported, survives numerous attempts to falsify it, and seems to account for observations conducted by different scientists in different settings. And, if there are competing hypotheses, scientists turn to principles like parsimony or simplicity – the less complex the hypothesis needed to account for the findings, the better. Because any particular observation in support of a hypothesis can be biased or in error, science requires **replication**. That is, empirical research must repeatedly reveal the same conclusions when conducted independently by different researchers. Only in this way can the biases of any one investigator or procedure be overcome.

Another aspect of scientific methods is that scientists submit their interpretations of their research to the critical review of fellow scientists. Before most research reports are published, a journal editor solicits the opinion of several reviewers,

experts on the topic of the research. They read the research report thoroughly and critically, looking for biases or alternative explanations of the findings that the authors might have missed, considering alternative hypotheses and related theories. They also assess the importance of the research and its contribution to understanding. Reviewers provide detailed feedback aimed at improving the research report or the research study on which it is based. In many cases the report is deemed not suitable for publication; indeed, rejection rates at the most prestigious scientific journals easily exceed 80%. The review process in the social sciences can be long and grueling, but the system is designed to ensure that research is scrutinized closely and is as accurate as possible before being communicated to policy makers, practitioners, and other researchers. A new challenge posed by the availability of the Internet and minimal costs for making "research" publicly available has been a proliferation of self-publishing and of "online-only" journals with varying amounts of critical review and analysis of the papers that are published. Self-publishing without any review has readily identifiable shortcomings. Some journals have similar shortcomings, for they do not seek experts most knowledgeable about each research paper to review it, and may even publish submissions with limited review if the authors are willing to pay to have their work published. Therefore, it is important to pay attention to the benchmarks set by different journals in their review process, and to be wary of research that does not appear in a journal that uses a credible peer review process.

Although the process built on independent replication and peer review is laudable, in fact, scientists are rarely as noble as an idealized picture of objective science paints them to be. Regardless of whether they are in a role of potential author or of reviewer, they have come to their beliefs through hard work, and are personally invested in their views. And, unfortunately, their efforts are at least in part driven by the requirement at many academic institutions that faculty publish with regularity and frequency, which might pressure them to publish their work prematurely or to submit work that they do not consider to be particularly important but seems publishable. They might even on occasion be a little more vain than most, and stick with their ideas in the face of contradictory information. Even though individual scientists might invest a great deal in trying to "prove" a hypothesis or in trying to demonstrate that all competing hypotheses are in error, the scientific process, by demanding rigorous research and independent replication, should eventually prove to be self-correcting. The scientific community and its journals, by requiring that research be critically reviewed before being published, sees to it that hypotheses are usually critically evaluated and that even the published work is only cautiously accepted by the scientific community as a whole.

A science of social behavior consists of the interchange between theories and empirical research. We do research in an attempt to examine the validity of our theories, and we also draw and develop our theories from observation of everyday social behaviors. Hence, systematic observation starts with a problem, a question, or a hypothesis that motivates it. Research and data, in turn, lead to modification of hypotheses and theories. Ideally the path of science, circling between theory development, hypothesis generation, observation, and hypothesis testing and theory refinement, is always guided by a skeptical and self-critical stance.

Summary

The social and behavioral sciences differ from the physical sciences in a number of ways. First, they concern people rather than objects, and, as a result, questions of value arise more frequently. These questions concern both how the results of the research are to be interpreted, what questions are asked in the first place, and what the role of the research participants is in the research. Second, social and behavioral science methods and conclusions often seem to be little more than common sense because – as casual observers – we routinely think about or try to explain people's behaviors.

As casual observers, all of us routinely develop explanations about our own and others' behaviors so that we can plan our lives and pursue our goals. These explanations take the form of hypotheses and theories about the causes of observed behavior. They are similar to aphorisms or clichés that are commonplace in everyday language. Not only do we put together such explanations, but we also attempt to figure out whether they are valid and appropriate. We rely on five kinds of evidence to help us determine the appropriateness of our explanations:

- logical analysis;
- advice of authorities or experts;
- consensus of our peers;
- further observations that we may make; and
- reflections about past events and behaviors.

Each of these sources of evidence necessarily involves some bias in the appraisal of our explanations.

The social sciences differ from casual observation in at least two ways, although the ultimate goal of both is to arrive at valid explanations for people's behavior.

1. Social scientists ultimately rely on systematic formulation of variables and collection and analysis of empirical data in order to have confidence in a hypothesis.
2. Scientists study the biases that are inherent in attempting to determine which explanations are good and which are poor, and they deliberately design their studies to minimize these biases.

As such, the scientific stance is always a skeptical one. A good scientist never accepts a hypothesis as true. The best that can be done is to gather empirical data that are consistent with the hypothesis. Ultimately, however, the scientist realizes that the hypothesis can never be proven. The research process, including peer review and independent replication, helps identify alternative explanations for different findings and advance science by focusing attention on research that adds to knowledge in important ways.

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Key Concepts

Authority
Casual observation
Causal association
Causal laws
Consensus
Construct
Constructivist/interpretivist approach
Covariation principle
Empirical research
Hypothesis
Logical analysis
Mixed methods
Naïve psychology
Objective
Observation
Operational definition
Operationism
Past experience
Pre-positivist approach
Positivist approach
Post-positivist approach
Replication
Theory
Threats to validity
Values

On the Web

http://home.xnet.com/~blatura/skep_1.html Good description of the scientific method from a website devoted to skeptics, with an emphasis on the need to hold paranormal phenomena to rigorous scientific standards.

http://www.project2061.org/tools/sfaaol/sfaatoc.htm This website contains a textbook, published by Science for All Americans Online, on the scientific enterprise. Especially relevant is Chapter 1, "The Nature of Science."

http://www.scientificmethod.com/b_body.html Description of the 11 major stages of the scientific method.

http://www.dharma-haven.org/science/myth-of-scientific-method.htm A site entitled "The Myth of the Magical Scientific Method," written by Terry Halwes. Halwes argues that scientists deviate in important ways from the logical hypothesis-testing view taught by most science textbooks.

http://www.ems.psu.edu/~fraser/BadScience.html An amusing website that provides numerous examples of researchers making bad mistakes in talking about scientific findings.

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