Chapter 1

SCIENCE

Research begins with a question. How many of these are also those? Why do so many of those end up in these circumstances? How often does this happen? Why does it seem to happen mainly to this type of person? etc.

Some questions can be studied empirically because they are questions about people or events or circumstances in the world that do or do not happen. Other questions can be the topic of heated debate, but they can never be resolved by looking to see what is actually the case. Other questions seem to fall partly in both categories. It is important to understand the kinds of questions that can be studied and to see how they can be framed in ways that make answers possible to find.

This book is about research—the process of asking questions about the world around you and getting answers to those questions. In particular, it's about *empirical* research—research in which the questions are about things that exist or happen, and in which the answers are obtained by somehow observing things in the world.

For purposes of this book, I'll divide "research" into three categories: *exploratory*, *descriptive*, and *explanatory*. Some people would add *evaluative* research as a fourth category, but I treat that as a combination of descriptive and explanatory research.

Some research is *exploratory* in nature, going where no one has been before. We don't know what to expect here, so we go with open eyes and ears and, we hope, minds. What kinds of issues are important to examine? How should these issues be approached? What kinds of obstacles must be overcome to do this kind of research? A few years ago I was asked to do some research on the communication networks of foster parents in British Columbia. Because I didn't know anything about foster parents or foster parenting (e.g. Where did they live? How many foster children did they have? What kinds of problems did they have to deal with? What kinds of support and assistance were available to them? Did they know one another? How did they fit into the community around them? What problems might I encounter in studying their communication patterns? What resources would be required in doing this research? Would they be willing to talk to me?) I had to begin with some exploratory research.

Once I had this background information, I was able to plan a *descriptive* study that would get at the specific kinds of information I wanted. Here my goal

was to obtain a complete and accurate *description* of events, conditions, circumstances, processes, and relationships surrounding the communication patterns of the foster parents. What were they like? What were relevant features of the interpersonal, familial, social, economic, and political contexts in which they lived? To whom did they turn for different kinds of information, for different kinds of support or assistance, etc. What kind of relationships did they have with the natural parents of their foster children? How typical were their experiences? Notice that this kind of research might tell me what was happening, but it wouldn't explain the causes of anything I saw.

To get at explanations of causal relationships between events and circumstances, a different kind of research would be more useful. When we are interested in causal relationships, we do *explanatory* research. How do the educational backgrounds of foster parents influence the way they relate to their children? Is a foster parent's success with children who come from abusive families influenced by the number and kind of relationships the parent has with other foster parents? Is the extent to which the foster parent is socially integrated related to the ability of the parent's foster children to form strong intimate ties when they become adults? Explanatory research is the most demanding kind of research, and it requires the use of special methods to identify causes and effects.

Science

The world is full of uncertainty and danger. To increase our chances of survival, we strive continuously to *understand* ourselves and our surroundings; to *predict* how people will behave and respond to our behavior; and to *control* those parts of reality that determine how our lives turn out.

Those key words—understand, predict, control—are the focus of science, which is about knowledge. (The word "science" comes from the Latin verb *scire*, which means "to know".) What makes science different from common-sense approaches to knowing about the world is that scientific explanations are subjected to empirical tests. This means that there must be evidence to support the conclusions of the explanations.

The nature of scientific inquiry

You generate knowledge about the world by systematically observing *events* and *phenomena* and by looking for *patterns* in what you observe—relations between classes of events or phenomena and other events or phenomena. Often you are not satisfied with the knowledge that a pattern or relation exists; you want explanations of why the relations and patterns are the way they are.

You perform these activities every day. I notice that people seem more likely to respond when I send them e-mail than when I send them an ordinary letter. When I want someone to do something, I'm more likely to receive cooperation when I ask them face-to-face than when I ask them over the phone or when I scribble a note. I also notice that certain themes in movies tend to make me feel unsettled for days, while others make me angry and others don't seem to do anything at all. These are examples of relationships I've noticed over time, as a result of reflecting on my own personal experience.

There are other relationships I have learned about, but not through my own experience. For example, I know that giving aspirin to a child who has measles may lead to serious medical problems. I know that you are more likely to change your attitude if you write an argument about why it would be a good thing to do than if you listen to me tell you why it would be a good thing to do. I know that taller people are often hired in preference to shorter people. I know that Canadian films are not as good as American films. And I know that we only use about 15% of our brains.

How did I learn these things, if not from my own experience? I learned about aspirin and measles on a radio program on the CBC. I learned about the power of "counter-attitudinal advocacy" in a course on interpersonal communication. I don't remember the source of the business about taller people, but it was probably a story in the newspaper. I don't really *know*

that Canadian films aren't as good, but … , well, everyone knows they aren't, … right?[1] And an article in *Readers' Digest* told me that "scientists have shown" that we use only 15% of our brains. If "scientists" demonstrated this, it must be true, even though the article appeared in *Readers' Digest* and not a scientific journal.

So knowledge comes from different sources: personal experience, textbooks or professors, the media, people around us, and anonymous "scientists." The "knowledge" from these different sources varies in its "hardness," in the sense that some is more dependable, more accurate, more "true." The sources vary in their credibility, and as well, any particular source will vary in the extent to which different people will believe it. In our society, people seem to rely more on knowledge that is "scientific"—knowledge that results from the use of something called the "scientific method." This book examines how the scientific method is applied in the study of communication.

Single instances vs. general patterns

A distinction is drawn between two modes of research—*idiographic* and *nomothetic-deductive*. The *idio* in "idiographic" also appears in "**idio**syncratic," which means "characteristic of thought or behavior *peculiar to an individual or group*." An idiographic study is one that explores a single person or event or situation in detail. Although the researcher doing this kind of work would learn a great deal about the idiosyncratic thoughts or behaviors of the person or situation, this information would apply only to the specific situation that was studied. Although it might give the researcher some ideas of what to look for in the wider context, it can't be used to describe the population from which the case studied was drawn.

The researcher who wants to learn something about social regularities—things that apply to people in general—must take a different approach. The nomothetic-deductive method is the one that is used for this purpose. The *nom* in "**nom**othetic" appears in words like "auto**nom**y," "eco**nom**y," and "astro**nom**y"—all words that describe *systems of laws or principles that govern different aspects of reality*. Nomothetic research attempts to discover what those systems of laws or principles are, while idiographic research is interested in describing only a single event, person, or situation.

Since it is interested in discovering the laws or principles that govern aspects of reality, nomothetic research cannot depend on information that describes a single individual. It needs information that describes enough cases so that general patterns or relationships can be seen. Ideally, it would use information that describes all people, events, or situations. This is clearly an impossibility, so a different approach is taken. Rather than using what might be called a "brute force" strategy, in which all possible cases would be examined, we use a method that replaces the naive application of persistence with an elegant set of *logical tools*.

These logical tools are based on the relation between an entire population and a subset of that population. If the subset is chosen in the right way, you can learn about the population by studying the much smaller subset. These "subsets" are, of course, samples.

The scientific method is a four-stage process: you make *observations*; you develop a *theoretical explanation* for those observations; you *operationalize* the abstract concepts that you used in your explanation; and finally, you *verify* the explanation in a process that involves making more observations. Since the final stage often involves revising the explanations, the process is cyclic and doesn't really have an end.

Since the process requires that you observe the world around you and then use your reasoning abilities to make sense of what you see, science is a *logico-empirical* system of knowing. This means that the knowledge obtained through the use of the scientific method should be based on the actual world around you (it's empirical), and it should be consistent with your experiences. It is the fourth stage, *verification*, that makes the scientific approach so de-

[1] *I* think many Canadian films are *better* than American films.

pendable. Anyone can come up with an explanation for even the most bizarre situations, but these explanations can't be considered scientific until they have been tested for reasonableness, consistency, and validity.

Three Assumptions of Science

In order for the scientific approach to work, some important conditions must be met. Reality (at least the parts of it that are subjected to scientific investigation) must be well-behaved in the sense that effects have causes and the relationship between causes and their effects can be explained without reference to magical or paranormal connections, like telekinesis, psychic channeling, divine intervention, and so on. Smith (1988, p. 6) states these requirements as three fundamental assumptions:

1) *all objects of scholarly inquiry are directly or indirectly observable.*

Scientific phenomena have "empirical referents,"

> I grew up just a few miles north of Windsor Ontario. I moved to California in 1971 to go to graduate school. I found, after several months, that people in California were different from the people I knew back east. I also found there to be some subtle differences in the way people seemed to relate to one another and to me. There was an apparent openness and easy familiarity—people were friendly and almost anyone would talk to you—but it seemed much more difficult to become really close to anyone.
>
> After going through my first warm sunny winter, I decided that the reason people in California were like that was that the Environment was their Friend and they didn't need other people. In the east we had to huddle together around the fireplace in the winter and around the air conditioner in the summer. We had to run and hide from tornados, and some strong connections were forged while huddling in a corner and waiting for the "all clear" sirens to sound. This didn't happen in California, where the environment was warm and friendly—not hostile and something to be avoided, like it was back home.
>
> Here are some personal observations of individual events, followed by an attempt to "understand" or "explain" what is going on. The explanation required some generalization from a relatively small number of specific instances and events to a much larger domain of social existence. Once I got the idea that the causal factor was the "environment," it became easy to find more and more evidence that I was on the right track. This reminds me of another piece of informal "research" I've been conducting for the last fifteen years or so.
>
> > I often had the experience of being outside when a small plane flew overhead. It seemed to me that much of the time when this happened, the shadow of the plane passed directly over me. There was a period of two or three years in which the shadow of every small plane that flew across the sky passed over me. Every one of those planes eclipsed the sun for a brief instant. Every one, without fail.
>
> What's going on here? I suspect that I notice the planes flying overhead when they block the sun for an instant. If a plane didn't get between me and the sun, I probably would be less likely to notice it. When I do this, I am practicing a common type of selective perception. I only see the evidence that would support my belief. This is probably what was happening in the case of the "Friendly Environment," but that was a much more complex situation. It is easy to measure the number of planes that fly overhead; consider the difficulty of measuring something as abstract and socially complex as "it's easy here to meet people, but really hard to get close to anyone."

which means that their existence can be either observed or *inferred* from observation. If you are interested in an abstract concept, such as how biased the television news coverage of a particular story is, you measure (observe) the level of bias by looking for things you would see if it were biased. These things, whatever they are, will be used as *indicators* of bias. While the bias itself is abstract and not directly observable, the indicators are concrete and thus easily observed.

2) *the world we live in is structured and orderly, not chaotic and disconnected*.

All effects have causes, and any observable effect is caused by some thing or things. There is nothing spontaneous and disconnected. This doesn't necessarily mean that you will be able to determine the causes for every effect, though, because you may not know how or where to look for the connections.

3) *empirical phenomena can be explained by referring to other natural antecedent phenomena.*

This implies that all empirical phenomena are explainable. In principle, nothing is completely beyond the realm of comprehension. Furthermore, "other-worldly" or metaphysical explanations are rejected; natural phenomena can be explained by referring to other natural phenomena. You assume the world is consistent and coherent—not mysterious, disjointed, and magical.

The scientific method is one approach to knowing. Babbie compares it to others, including *tradition*, which is how we know about Canadian films, and *authority*, which is how I know about aspirin and measles (1989, pp. 7-28). In your day-to-day life, you make a number of errors as you gather knowledge. You make inaccurate observations. Since the information on which you base your conclusions is faulty, your conclusions lack validity. You overgeneralize—you see a few instances of a pattern or relationship, and you assume what you see is typical, when that may not be the case. You are guilty of selective perception—you notice an interesting pattern and you pay attention to future events or situations that can be matched to the pattern, while you ignore anything that doesn't fit. You fill in the gaps with information that you make up on the spot. Of course you're usually not aware of doing this, because it seems so logical and appropriate that you enjoy great success in convincing yourself that it's true and accurate. You use illogical reasoning. I'm sure you've heard contradictions explained by the expression "the exception that proves the rule," which neither makes sense nor explains anything. Finally, you engage in mystification—you simply decide that some things are just beyond your ability to understand or comprehend. They are that way because that is their fate. Recently I was told that the reason a neighbor's house was broken into was that "he has bad karma."

The scientific method uses a number of tools that work to prevent the kinds of problems mentioned above. This book will introduce you to those tools so you can better understand the empirical research that you encounter as a student and so that you can make use of them in your own research.

If you wanted to characterize science, you could start with a summary of its essential qualities. Here are four of them:

1) *Science is systematic*. Science proceeds in a deliberate, orderly fashion. There are particular steps that must be taken, and they must be taken in a particular order.

2) *Science is rational*. It uses precise rules of logic. Two particular systems of logic are especially important:

   a) *Induction* begins with information about specific instances and moves to a generalized inference about patterns or relationships that would explain the specific cases—from facts to theories. This form of logic is used in the development of explanations.

   b) *Deduction* applies a theory to a particular case. It starts with a general statement about patterns or relationships (an explanation) and moves to conclusions about particular instances that

would be logically implied if the general statement were true. This form of logic is used in the verification of explanations. (If this explanation is true, you would expect to see X. Do you see X?)

3) *Science is cyclical and self-correcting*. Scientists begin with generalizations—conclusions about or explanations of some observed pattern in the data. If these conclusions or explanations are correct, they will be able to say that they understand the situation they are studying. So they test the generalizations against reality by making additional observations and comparing them with the predictions of the generalizations. The conclusions or explanations are revised on the basis of the result of these tests. The revised generalizations are again tested against reality by making additional observations … etc.

4) *Science is positive*. It deals with questions about what *is* and *why* it is, rather than what *ought to be*. A recent graduate student at my university wrote a thesis about assisted suicides. Who participated in the suicides and how the participants felt about what they did and what arguments they made about the correctness or appropriateness of their actions were all valid topics for scientific enquiry. Science could not, however, determine whether it is wrong to assist someone to commit suicide. This is a question of personal values and beliefs.

A Scientific Approach to Communication Research

When you study communication scientifically, you work with three processes—theory, operationalization, and observation. (If any of these are missing, you can't *do* science.) In what is often called the "Classical Scientific Method" these processes happen in this order.

You develop a *theoretical explanation* for the situation you are investigating. A theoretical explanation is a set of statements about a number of concepts and the relations between them. You might be interested in the increasing divorce rate in Canadian cities. Your theoretical explanation may relate a number of concepts, such as a shift away from older traditions, increasing exposure to a variety of ethnic customs, and pressures on family structures created by the increasingly explicit content of popular media. Your theory would specify how these concepts are related to one another and how they come together to produce an increase in the divorce rate.

To connect your theory to the world you live in, you have to *operationalize* your concepts. That is, you have to create explicit links from the abstract concepts in the theory to concrete phenomena in the real world. How do you recognize a "shift from older traditions"? What are the older traditions? How do you know there is a shift away from them? How can you determine how explicit the "popular media" are? What counts as explicit? And how does this bring pressure on family structures? What is the nature of that pressure, and how can you see it in action? And so on. The links you make between the abstract and the concrete play a critical role in scientific research—the whole operation depends on their validity.

Finally you need to perform some *observation*s. Everything we've done so far could take place in the library or in your study, but now it's necessary to go out into the world and collect some data on what happens there. This is the part that makes science empirical. You might think the observation part means looking or watching or listening to what happens. It does, but it also means analyzing what you see or hear. Somehow you need to establish the connection between the concrete and the abstract once again, so your results can be brought to bear on the theory you started with. One of the tools you use to do this is statistics. You'll learn something about statistics in this book—what it is about and how it is used in the study of communication.

Theory

I said above that a theory is a set of statements about a number of constructs and the relations between

them. More specifically: a *theory* is a formal statement of definitions and propositions concerning the relations among a set of constructs created for the purposes of explanation, understanding, prediction, and control of phenomena[2].

Most theories have three components: a *generative force* or motivating reason (x), a pattern of *effects* (y), and a set of *boundary conditions* (z) that specifies how and under what circumstances the generative force is likely to explain its effects (see Smith, 1988, pp. 11-12). Several years ago I did some research to investigate a theory about the relation between the way violence is portrayed in films and the effect the violent content would have on people who watched the film. The theory suggested that people who watched what was then called "sanitized violence"—violence from which the gruesome, painful, destructive, disfiguring consequences have been removed—were much more likely to see violence as a quick, efficient, and acceptable way of responding to problems than were people who saw the "unsanitized" version. Here the generative force is exposure to violent content; the effects are changes in the way people view violence as a method of dealing with problems; and the boundary condition is the extent to which the gory consequences are shown.

There are different kinds of *generative forces* in theories, leading to different forms of explanations. The simplest kind are ordinarily called "causes." A *cause* is an antecedent condition (something that happens first) that produces a consequent *effect* (something that happens later as a result of what happened earlier) over which the people involved have no control. The effect happens whether or not the person or people involved want it to; it is an unavoidable consequence of the cause. In the above example, exposure to violence and seeing or not seeing the consequences of the violence are causes.

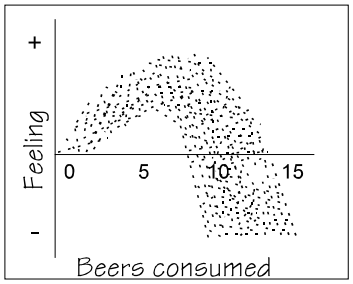
The specific relation between the cause and the effect is often called a "mechanism," which suggests that this type of explanation may be somehow "mechanical." A theory that explains patterns by reference to uncontrollable antecedents employs *causal explanation* and is called a *law*. (*ex:* Because they are naturally more aggressive and solitary, men make more assertions and give more orders than women; because they are naturally more cooperative and social, women ask more questions and make more requests than men. Men and women behave like this *because* they are men and women, not because they want to or they think they should.)

A second, more complex, type of generative force is the *rule*. A theory that explains communication patterns by reference to norms or social customs employs *rule-based explanation* and is called a *rule* of communication. Rules can take many different forms. In most countries, for example, people almost always cover certain parts of their bodies when they are in public places, even when it is warm. They do this because it is a social norm—a rule. In job interviews, people tend to perform more nonverbal actions that show deference and respect for the person giving the interview than they do in other circumstances. They do this because there is a norm (a rule) about how one behaves toward an employer. When you approach an intersection in which the traffic light is red, you stop because there is a law (a particular type of rule) that specifies what you should do in intersections. Note that it is quite possible to break these rules, although there is usually a price to be paid if you are caught.

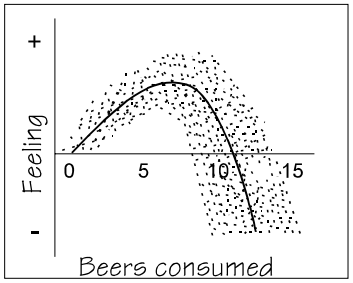
A third type of generative force is the *reason*. A reason refers to the preexisting goals, needs, and desires of a person that explain patterns of behavior and of communication. A theory that explains patterns by reference to goals or subjective reasons for acting is called a *teleological* explanation. (*ex:* In order to avoid confusion and resulting problems, I edit my exam questions very carefully. In order to extract more warmth and caring behavior, I exaggerate the pain caused when someone "accidentally" bumps my head while putting a frying pan away.) A great deal of research energy is directed toward understanding the dynamics of communication behavior by focusing on how people's goals and their efforts to achieve them affect how they interact with one another.

[2] Kerlinger, 1964, p. 11

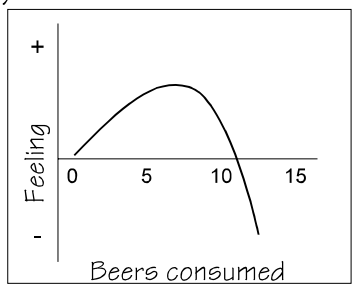
Induction (Data-to-Theory)



You observe how people feel after they drink different amounts of beer.



You notice there is a pattern in your data. This is an "inverted U-shaped" relationship.



You conclude that people in general feel "better" when they drink more beer, up to a point at which more beer makes them feel worse — much worse!

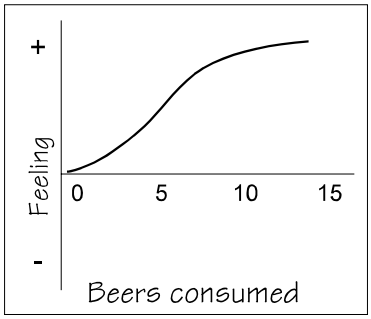
Constructing Theory

There are two approaches to constructing theory. They differ in how they treat the relation between the data and the statements that comprise the theory. There has been a good deal of controversy about the conflict between these approaches.

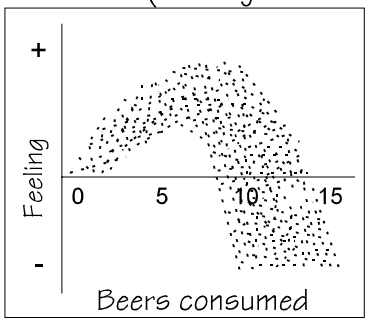
1) When the scientist begins by making observations and then constructing a theoretical explanation that would account for the observed patterns, the logic is called *data-to-theory* and the logical method being used is *inductive*. The logical pattern is to move from the specific to the general. The data-to-theory method is sometimes called "grounded theory." This approach is useful for the *creation* of theories in areas where there hasn't been much previous research. However, one weakness of this approach is that theories created in this fashion *always* match the data upon which they are based. Looking to see how well the theory "fits" the data only tells how good a job the theorist did while describing the data; the data cannot be used to test the theory. For this reason the data-to-theory approach is combined with the theory-to-data approach.

2) When the scientist begins with a theory which is tested against observed data, the logic is called *theory-to-data* and the logical process being used is *deductive*. The pattern here is to move from the general to the specific—exactly the opposite of the

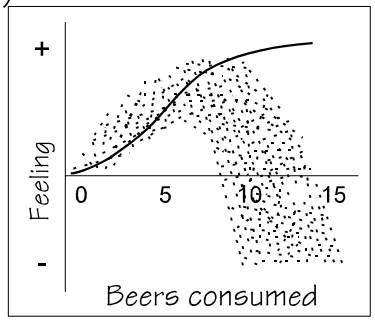
Deduction (Theory-to-Data)



You hypothesize that drinking beer makes people feel good, and that the more beer one drinks, the better one feels.



You observe how people feel after they drink different amounts of beer.



You compare your hypothesized pattern with your observed data and conclude your hypothesis needs to be revised. (After Babbie, 1989, p. 43)

inductive method. In the theory-to-data method, data are used to test the theory. A failure of the data to fit the theory is usually taken as an indication that there is something wrong with the theory, with the measurement methods (and thus with the data), with the methods being used to compare the data to the theory, or with the logic leading the researcher to expect the theory to fit the data.

While the inductive researcher is supposed to create explanations of observed data, the deductive researcher can get explanations from any source desired. In practice, the two modes of research are complimentary: the inductive approach is used in the development of theory and the deductive approach is used in the verification of theory. Used together, the two methods are much stronger than either one used separately.

Verifying Theoretical Explanations

Once you've developed your theoretical explanation, you will want to test it. Do things work the way your theory says they do? Does the theory need to be modified? At this point, the theory is nothing more than an argument based on some knowledge, some assumptions, some suppositions, and some reasoning. I could come up with a different theory that would explain the same situation, but it might be based on different concepts related in a different way, or it might have a different generative force. If you compare what the two theories say about a situation, you might see that they do not agree with one another. In any case, the next step is to test your theoretical explanation.

Right away you run into a problem. Theories are statements about relations between abstract concepts—they don't say anything about concrete reality. For example, the "uncertainty reduction theory" of social relationships says that in the early stages of a relationship, the participants will engage in certain kinds of activities aimed at reducing the uncertainty associated with not knowing one another. The theory says that the relationship will not be able to develop unless this uncertainty is reduced to an acceptable level. The key concepts here are uncertainty, the uncertainty-reduction process, and the development of relationships. You can't observe these abstract concepts directly, though, so you need a way to make the theory connect with the concrete world. Here is where you use some deductive reasoning. Remember that deduction starts with a general statement relating concepts to one another (an explanation) and moves to specific conclusions about particular instances that would be logically implied if the general statement were true.

You don't test the abstract theory directly; instead, you test the specific conclusions logically implied by the theory. If the theory is true, you would expect to see particular things happen in certain situations. Because of the theory, you can make predictions about what will happen in these situations. These predictions are called *hypotheses*. Since hypotheses are predictions about specific things that may or may not happen in particular situations, they can easily be tested. Do you see what you would predict on the basis of the theory? If you do, you have obtained some evidence that supports the theory. On the other hand, if you don't see what you would predict, you know you have a problem.

Even if you do see the evidence, though, you still can't say that you have proven that the theory is true. This is because several different explanations could lead to the same conclusions. These *alternative explanations* may fit the data just as well, although they may be based on completely different generative forces and relations between phenomena. Since it is not possible to rule out all alternative explanations, it is not possible to prove the truth of a theory. However, you may be able to demonstrate that the theory is consistent with all existing evidence; it would thus be as good as if it were the one true explanation, until a situation that provokes obvious errors is encountered.

Pay careful attention to the little logical maneuver described in the above two paragraphs: Because theories are abstract, they cannot be tested directly. If

a theory is true, you should be able to see evidence of it in the concrete world you live in. Hypotheses are predictions about things that should happen in the concrete observable world. They are also logically implied by the theory—if the theory is true, the predictions made in hypotheses should also be true. This is why researchers test hypotheses when they are really interested in their theories.

Here are four criteria you may use to evaluate a theory:

1) *Empirical validity*: If a theory is a "formal statement of definitions and propositions concerning the relations among a set of constructs created for the purposes of explanation, understanding, prediction, and control," the relationships it describes ought to be seen in the data. Do the predictions implied by the theory match the data? Are the hypotheses supported by the data?

2) *Perspicuity*: If a theory is clear, lucid, readily understandable, unambiguous, and precisely stated, it is **perspicuous**. Because of its perspicuity, it is likely to lead to explicit, unequivocal predictions. Without this clarity and precision, it is neither possible to take the measurements needed to test the theory nor to draw conclusions about the theory's empirical validity.

3) *Parsimony*: A theory that uses few concepts and relations is **parsimonious**. It is simple and straightforward; it isn't a complex mess of many relationships tying numerous concepts together in several different ways. Because of its parsimony, it is more likely to be internally consistent, and easier to connect with reality. It is also more likely to lead to unambiguous and unequivocal predictions.

4) *Utility*: Does the theory, like the *USS Enterprise*, go "where no one has gone before"? Does it explain previously inexplicable phenomena? Does it present a parsimonious explanation for a set of phenomena previously thought to be unrelated? Does it have *heuristic value*—does it set the stage for further conceptual developments and empirical research? Should anyone care about the theory? Does it matter? Is it likely to have any effect on their lives?

Research Design

A number of decisions must be made when a research study is planned. These decisions concern a number of issues commonly referred to as "research design." The decisions you make here will have far-reaching implications for how the research is conducted, the nature of the data you obtain, the kinds of analysis you will be able to do, the kinds of information you will obtain about the situation under investigation, and the use to which that information may be put.

Eight of these design issues are reviewed here (in no particular order) and the implications of some combinations of these issues are examined. The presentation follows the one in Smith (1988, pp. 180-182).

1. Quantitative *vs.* Qualitative

This is probably the first distinction you would make when you consider research design. Does the research focus on quantitative issues—does it use numbers and statistics? Is it "scientific"? Does it use complicated or sophisticated approaches to measurement and analysis? Or is the focus on qualitative issues—does it focus on feelings and ideas? Does it examine narratives or stories or cultural issues? Does the data come from transcripts and documents? Is the research more "humanistic" than precise and scientific?

Many people feel this issue is important enough that they identify strongly with one approach in favor of the other. I have known people who consider quantitative research to be useless, irrelevant, weak, and wrong, while they feel qualitative research is valuable, relevant, socially important, and good. At the same time, I have known other people who consider research that doesn't have a mathematical basis to be useless and of no value. For them, the

presence of numbers is a sure sign that the research and its conclusions are valid and good. In some places there seems to be a war between the two camps. "Whose side are you on? Are you one of us or one of them?"

My own position is that Quantitative *vs*. Qualitative is a false dichotomy. These two perspectives are complementary; they are the two sides of the coin. Each one by itself is incomplete and can only give part of the picture. The prudent researcher will combine the two perspectives and produce better results. Much research is both qualitative *and* quantitative at the same time. Finally, the presence of numbers does not necessarily mean that the research is quantitative.

2. Interpretive *vs.* Functional

An increasingly popular approach to research is postmodernist deconstruction in which the "text" is analyzed and the meanings behind everything are laid bare. The interpretive approach focuses on the deeper meanings underlying events or situations. It is by its nature abstract and conceptual. In contrast, the functional approach is concerned with the study of behavior and effects. When meanings are considered here, they will be viewed as causes and effects of various communication behaviors. This research is more likely to be concrete and specific.

3. Manipulated *vs.* Observed

Researchers who want to understand the relations between phenomena may choose to introduce some kind of change to the situation so they can see what happens. The classical laboratory experiment defines one end of this continuum. It begins with random assignment, which produces two equivalent groups. One will be subjected to the changed conditions and the other will not. The other two necessary components of experiments are isolation and manipulation of an independent variable (causal factor), and subsequent measurement of a dependent variable (the effect). A study in which one group of people are shown a movie in which the gory, painful, gruesome consequences of violent acts are clearly depicted and another group are shown a version in which the consequences have been removed illustrates this approach.

The somewhat contrived experimental method may be contrasted with the naturalistic approach in which researchers observe and study processes as they take place in the course of ordinary day-to-day life, free from the artificial manipulations of the experiment. While this strategy may produce more natural or "realistic" results, it does not have the experiment's ability to identify causal relationships. With this approach, a study of the effects of exposure to the consequences of violence may produce some valuable insights, but it will at best be a correlational study that may show that people who do not see the consequences of violence may tend to behave more aggressively than those who see the consequences, but it will not be able to establish a causal link the way the experiment could.

4. Laboratory *vs.* Field

Some research is conducted in an artificial environment, all aspects of which are controlled by the researcher. Other studies take place in a natural environment where people normally are found in the course of day-to-day life. Laboratory studies are useful because the high degree of control allows the researcher to rule out possible disturbances or "contaminations" that would probably cause the results to be less reliable or valid than they otherwise would be.

Field research, on the other hand, leaves the research open to the vicissitudes of ordinary life. The researcher who wants to learn about how people in small communities behave when their houses are destroyed by a tropical storm can't answer the question with a controlled laboratory study; he has to wait for a hurricane or typhoon to develop.

The advantage of field research is that it can be used to address issues in the context in which they ordinarily occur, whereas the laboratory researcher is required to isolate the focus of inquiry from its normal context in order to prevent biasing the results. This clearly poses a dilemma: are the complexities of the field a greater threat than the certain distortions

caused by the decontextualization demanded by laboratory research?

5. Participant *vs* non-participant

The anthropologist graduate student who enrolled as a student in high school and spent a year living as a student—attending classes, hanging out in the cafeteria, participating in extra-curricular activity—all the while taking careful notes about what was done, what was said, how other students felt, and so on, was involved in an observational study as a participant. She became a student in order to gain access to knowledge of the lives of the other students. An outsider wouldn't have a chance to learn as much as the researcher who lived as one of them for a year.

In contrast is the researcher who observes the social interactions of people in a shopping mall from a vantage point at a table in the food fair. He is outside the situation under investigation and would hope to have no effect on the people he is observing. The non-participant will not be able to have the intimate knowledge of the people he is observing.

6. Overt *vs.* Unobtrusive

Students who participate in a psychological study on campus in exchange for $5.00 ("for a few minutes of your time") or for credit in Psychology 100 are aware of the fact that they are participating in someone's research project. Although they may not know the exact nature of the research, no attempt is made to hide the fact that they are being observed or measured. In contrast to the overt approach, the shoppers in the mall who are observed by the researcher sitting at a table in the food fair are not aware of being observed. An even more unobtrusive approach would be to observe the tapes produced by security cameras located high on the ceiling in many places of business. Here, the researcher is not even physically present. Unobtrusive researchers may examine any kind of evidence people may leave, including the oil spots under their cars in parking lots, the contents of their garbage cans, the litter they throw on the street, or the number of rooms in their houses that are lit up in the evening.

While overt methods may seem better for direct measurement of complex issues, the imaginative researcher may be able to devise unobtrusive ways of getting at many issues without intruding on or interrupting the natural flow of daily life in any way.

7. Cross-sectional *vs.* Longitudinal

If you were interested in changes in attitudes of students as they progress through the years of study at University, you could take measurements of a cross-section of students who are at various stages in their studies. Then you might compare students who have completed fewer than 30 credits with those who have completed 60, 90, and 120 credits. You would be approximating the process individuals go through by comparing people at various stages in their academic lives to one another.

On the other hand, you could take a longitudinal approach in which you would follow the same group of students as they progress through their studies. Where the cross-sectional method requires only one measurement at a single point in time, the longitudinal method requires a series of measurements over a much longer period of time. With the longitudinal approach, the processes and changes that are estimated by the interpolation the cross-sectional method requires are actually observed over time as they take place. The obvious drawback to the longitudinal method is that measurements must be made over long periods of time—in some cases, decades. The advantage, however, is that the longitudinal approach situates the observations in a historical context, something that is not possible with the cross-sectional method.

8. Basic *vs.* Applied

Is the research focused on purely theoretical issues with no attention given to specific applications in particular situations, or does it focus on addressing specific real problems in a pragmatic manner? Basic research, sometimes called "pure" research, is usually conducted without any direct, explicit connections to the "real" world. For example, a researcher may investigate the mathematical properties of a class of

equations without giving any consideration to what the equations describe. While this line of research may result in the discovery of unexpected mathematical properties that later turn out to be especially valuable in the analysis of important social situations, the original goal of the researcher was to explore the class of equations, not to develop solutions to social problems.

A researcher who is interested in finding a solution to a particular social problem doesn't care about discovering new mathematical properties. She is doing applied research, and she has a more immediate, concrete goal to worry about. The questions her research is trying to answer are likely to be concrete and to address specific situations or particular conditions at a single point in time.

While some applied research results in discoveries that change the way people understand the world, these kinds of results are more likely to come from basic research, where the focus of inquiry is likely to be abstract and theoretical—not tied explicitly to any particular situation or event.

Recall the distinction made between idiographic and nomothetic research on page 5. An idiographic study is one that explores a single person or event or situation in detail, while the researcher who wants to learn something about social regularities—things that apply to people in general—takes a nomothetic approach. Idiographic research is likely to be qualitative, interpretive, naturalistic, longitudinal study conducted in the natural environment where the subject of the research normally lives. An example would be the kind of study the biographer makes in preparation for a book about the early life of Charles Darwin, for example. While this research may paint a detailed picture of the book's subject, it will not explain social trends or general responses to political or economic events.

The firm that conducts a public opinion poll of attitudes toward a referendum about minority language rights in Quebec or California, on the other hand, is conducting nomothetic research, which tends to be quantitative, non-participant, overt, cross-sectional, and applied in orientation. The poll involves asking a standard set of questions to a large number of people over a short period of time by trained researchers working out of an office equipped with a bank of telephones and computer terminals. The answers to the questions are entered into the computers as the interviews are conducted. One or two days after the last interview has been completed, the results will have been analyzed, tabulated, and ready for interpretation. Patterns of attitudes and, the pollsters hope, voting trends, will be identified, although there will be no information about the attitudes of any single person.

As the book progresses, the research design issues will be referred to from time to time in order to help you see how things fit together. Various studies will be discussed in the readings, in lectures, and in tutorials. If you examine each of these in terms of the eight design issues outlined in the previous pages, you will find it easier to understand the material and to prepare various assignments and exams.

Important Terms and Concepts

abstract concept
alternative explanation
antecedent condition
applied
basic
boundary conditions
cause
causal explanation
cross-sectional
deduction vs. induction
description vs. explanation
effect
empirical
experiment
explanation
field research
functional research
generative forces
goal
grounded theory
heuristic
idiographic vs. nomothetic
interpretive research
laboratory study
law
logically implied
longitudinal
nomothetic-deductive
observable
overt
parsimony
participant observation
perspicuity
positive
rational
reason
research (exploratory, descriptive, explanatory)
rule
rule-based explanation
teleological explanation
theory
unobtrusive
utility