CHAPTER ONE

# A Framework for Design

In the past two decades, research approaches have multiplied to a point at which investigators or inquirers have many choices. For those designing a proposal or plan, I recommend that a general framework be adopted to provide guidance about all facets of the study, from assessing the general philosophical ideas behind the inquiry to the detailed data collection and analysis procedures. Using an extant framework also allows researchers to lodge their plans in ideas well grounded in the literature and recognized by audiences (e.g., faculty committees) that read and support proposals for research.

What frameworks exist for designing a proposal? Although different types and terms abound in the literature, I will focus on three: quantitative, qualitative, and mixed methods approaches. The first has been available to the social and human scientist for years, the second has emerged primarily during the last three or four decades, and the last is new and still developing in form and substance.

This chapter introduces the reader to the three approaches to research. I suggest that to understand them, the proposal developer needs to consider three framework elements: philosophical assumptions about what constitutes *knowledge claims*; general procedures of research called *strategies of inquiry*; and detailed procedures of data collection, analysis, and writing, called *methods*. Qualitative, quantitative, and mixed methods approaches frame each of these elements differently, and these differences are identified and discussed in this chapter. Then typical scenarios that combine the three elements are advanced, followed by the reasons why one would choose one approach over another in designing a study. This discussion will not be a philosophical treatise on the nature of knowledge, but it will provide a practical grounding in some of the philosophical ideas behind research.

## THREE ELEMENTS OF INQUIRY

In the first edition of this book, I used two approaches—qualitative and quantitative. I described each in terms of different philosophical assumptions about the nature of reality, epistemology, values, the rhetoric of research, and methodology (Creswell, 1994). Several developments in the last decade have caused a reexamination of this stance.

- Mixed methods research has come of age. To include only quantitative and qualitative methods falls short of the major approaches being used today in the social and human sciences.
- Other philosophical assumptions beyond those advanced in 1994 have been widely discussed in the literature. Most notably, critical perspectives, advocacy/participatory perspectives, and pragmatic ideas (e.g., see Lincoln & Guba, 2000; Tashakkori & Teddlie, 1998) are being extensively discussed. Although philosophical ideas remain largely "hidden" in research (Slife & Williams, 1995), they still influence the practice of research and need to be identified.
- The situation today is less quantitative *versus* qualitative and more how research practices lie somewhere on a continuum between the two (e.g., Newman & Benz, 1998). The best that can be said is that studies *tend* to be more quantitative or qualitative in nature. Thus, later in the chapter I introduce *typical* scenarios of quantitative, qualitative, and mixed methods research.
- Finally, the practice of research (such as writing a proposal) involves much more than philosophical assumptions. Philosophical ideas must be combined with broad approaches to research (strategies) and implemented with specific procedures (methods). Thus, a framework is needed that combines the elements of philosophical ideas, strategies, and methods into the three approaches to research.

Crotty's (1998) ideas established the groundwork for this framework. He suggested that in designing a research proposal, we consider four questions:

1. What epistemology—theory of knowledge embedded in the theoretical perspective—informs the research (e.g., objectivism, subjectivism, etc.)?
2. What theoretical perspective—philosophical stance—lies behind the methodology in questions (e.g., positivism and postpositivm, interpretivism, critical theory, etc.)?



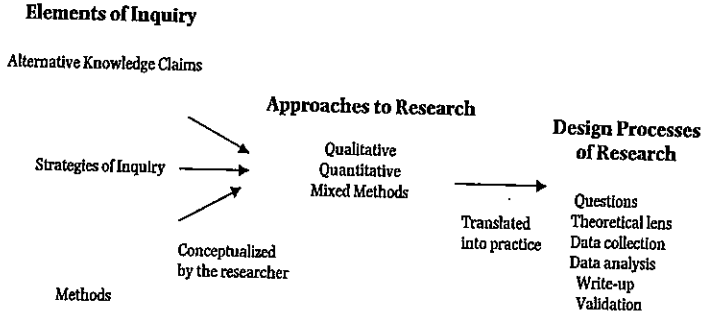


**Figure 1.1** Knowledge Claims, Strategies of Inquiry, and Methods Leading to Approaches and the Design Process

3. What methodology—strategy or plan of action that links methods to outcomes—governs our choice and use of methods (e.g., experimental research, survey research, ethnography, etc.)?
4. What methods—techniques and procedures—do we propose to use (e.g., questionnaire, interview, focus group, etc.)?

These four questions show the interrelated *levels* of decisions that go into the process of designing research. Moreover, these are aspects that inform a choice of approach, ranging from the broad assumptions that are brought to a project to the more practical decisions made about how to collect and analyze data.

With these ideas in mind, I conceptualized Crotty's model to address three questions central to the design of research:

1. What knowledge claims are being made by the researcher (including a theoretical perspective)?
2. What strategies of inquiry will inform the procedures?
3. What methods of data collection and analysis will be used?

Next, I drew a picture, as shown in Figure 1.1. This displays how three elements of inquiry (i.e., knowledge claims, strategies, and methods) combine to form different approaches to research. These approaches, in turn, are translated into processes in the design of research. Preliminary steps in designing a research proposal, then, are to assess the knowledge claims brought to the study, to consider the strategy of inquiry that will be used, and to identify specific methods. Using these three elements, a

| | |
|---|---|
| **Postpositivism**<br>Determination<br>Reductionism<br>Empirical observation and measurement<br>Theory verification | **Constructivism**<br>Understanding<br>Multiple participant meanings<br>Social and historical construction<br>Theory generation |
| **Advocacy/Participatory**<br>Political<br>Empowerment issue-oriented<br>Collaborative<br>Change-oriented | **Pragmatism**<br>Consequences of actions<br>Problem-centered<br>Pluralistic<br>Real-world practice oriented |

researcher can then identify either the quantitative, qualitative, or mixed methods approach to inquiry.

## Alternative Knowledge Claims

Stating a *knowledge claim* means that researchers start a project with certain assumptions about how they will learn and what they will learn during their inquiry. These claims might be called paradigms (Lincoln & Guba, 2000; Mertens, 1998); philosophical assumptions, epistemologies, and ontologies (Crotty, 1998); or broadly conceived research methodologies (Neuman, 2000). Philosophically, researchers make claims about what is knowledge (ontology), how we know it (epistemology), what values go into it (axiology), how we write about it (rhetoric), and the processes for studying it (methodology) (Creswell, 1994). Four schools of thought about knowledge claims will be discussed: postpositivism, constructivism, advocacy/participatory, and pragmatism. The major elements of each position are presented in Table 1.1. In discussions to follow, I will attempt to translate the broad philosophical ideas of these positions into practice.

### *Postpositive Knowledge Claims*

Traditionally, the postpositivist assumptions have governed claims about what warrants knowledge. This position is sometimes called the "scientific method" or doing "science" research. It is also called quantitative research, positivist/postpositivist research, empirical science,



and postpostivism. The last term, "postpositivism," refers to the thinking after positivism, challenging the traditional notion of the absolute truth of knowledge (Phillips & Burbules, 2000) and recognizing that we cannot be "positive" about our claims of knowledge when studying the behavior and actions of humans. The postpositivist tradition comes from 19th-century writers such as Comte, Mill, Durkheim, Newton, and Locke (Smith, 1983), and it has been most recently articulated by writers such as Phillips and Burbules (2000).

Postpositivism reflects a deterministic philosophy in which causes probably determine effects or outcomes. Thus, the problems studied by postpositivists reflect a need to examine causes that influence outcomes, such as issues examined in experiments. It is also reductionistic in that the intent is to reduce the ideas into a small, discrete set of ideas to test, such as the variables that constitute hypotheses and research questions. The knowledge that develops through a postpositivist lens is based on careful observation and measurement of the objective reality that exists "out there" in the world. Thus, developing numeric measures of observations and studying the behavior of individuals become paramount for a postpositivist. Finally, there are laws or theories that govern the world, and these need to be tested or verified and refined so that we can understand the world. Thus, in the scientific method—the accepted approach to research by postpostivists—an individual begins with a theory, collects data that either supports or refutes the theory, and then makes necessary revisions before additional tests are conducted.

In reading Phillips and Burbules (2000), one can gain a sense of the key assumptions of this position, such as the following:

1. That knowledge is conjectural (and anti-foundational)—absolute truth can never be found. Thus, evidence established in research is always imperfect and fallible. It is for this reason that researchers do not prove hypotheses and instead indicate a failure to reject.
2. Research is the process of making claims and then refining or abandoning some of them for other claims more strongly warranted. Most quantitative research, for example, starts with the test of a theory.
3. Data, evidence, and rational considerations shape knowledge. In practice, the researcher collects information on instruments based on measures completed by the participants or by observations recorded by the researcher.

4. Research seeks to develop relevant true statements, ones that can serve to explain the situation that is of concern or that describes the causal relationships of interest. In quantitative studies, researchers advance the relationship among variables and pose this in terms of questions or hypotheses.
5. Being objective is an essential aspect of competent inquiry, and for this reason researchers must examine methods and conclusions for bias. For example, standards of validity and reliability are important in quantitative research.

### *Socially Constructed Knowledge Claims*

Others claim knowledge through an alternative process and set of assumptions. Social constructivism (often combined with interpretivism; see Mertens, 1998) is such a perspective. The ideas came from Mannheim and from works such as Berger and Luckmann's *The Social Construction of Reality* (1967) and Lincoln and Guba's *Naturalistic Inquiry* (1985). More recent writers who have summarized this position are Lincoln and Guba (2000), Schwandt (2000), Neuman (2000), and Crotty (1998), among others. Assumptions identified in these works hold that individuals seek understanding of the world in which they live and work. They develop subjective meanings of their experiences—meanings directed toward certain objects or things. These meanings are varied and multiple, leading the researcher to look for the complexity of views rather than narrowing meanings into a few categories or ideas. The goal of research, then, is to rely as much as possible on the participants' views of the situation being studied. The questions become broad and general so that the participants can construct the meaning of a situation, a meaning typically forged in discussions or interactions with other persons. The more open-ended the questioning, the better, as the researcher listens carefully to what people say or do in their life setting. Often these subjective meanings are negotiated socially and historically. In other words, they are not simply imprinted on individuals but are formed through interaction with others (hence social constructivism) and through historical and cultural norms that operate in individuals' lives. Thus, constructivist researchers often address the "processes" of interaction among individuals. They also focus on the specific contexts in which people live and work in order to understand the historical and cultural settings of the participants. Researchers recognize that their own background shapes their interpretation, and they "position themselves" in the research to acknowledge how their interpretation flows from their own personal,



cultural, and historical experiences. The researcher's intent, then, is to make sense of (or interpret) the meanings others have about the world. Rather than starting with a theory (as in postpostivism), inquirers generate or inductively develop a theory or pattern of meaning.

For example, in discussing constructivism, Crotty (1998) identified several assumptions:

1. Meanings are constructed by human beings as they engage with the world they are interpreting. Qualitative researchers tend to use open-ended questions so that participants can express their views.
2. Humans engage with their world and make sense of it based on their historical and social perspective—we are all born into a world of meaning bestowed upon us by our culture. Thus, qualitative researchers seek to understand the context or setting of the participants through visiting this context and gathering information personally. They also make an interpretation of what they find, an interpretation shaped by the researchers' own experiences and backgrounds.
3. The basic generation of meaning is always social, arising in and out of interaction with a human community. The process of qualitative research is largely inductive, with the inquirer generating meaning from the data collected in the field.

### *Advocacy/Participatory Knowledge Claims*

Another group of researchers claims knowledge through an advocacy/participatory approach. This position arose during the 1980s and 1990s from individuals who felt that the postpostivist assumptions imposed structural laws and theories that did not fit marginalized individuals or groups or did not adequately address issues of social justice. Historically, some of the advocacy/participatory (or emancipatory) writers have drawn on the works of Marx, Adorno, Marcuse, Habermas, and Freire (Neuman, 2000). More recently, works by Fay (1987), Heron and Reason (1997), and Kemmis and Wilkinson (1998) can be read for this perspective. In the main, these inquirers felt that the constructivist stance did not go far enough in advocating for an action agenda to help marginalized peoples. These researchers believe that inquiry needs to be intertwined with politics and a political agenda. Thus, the research should contain an action agenda for reform that may change the lives of

the participants, the institutions in which individuals work or live, and the researcher's life. Moreover, specific issues needed to be addressed that speak to important social issues of the day, issues such as empowerment, inequality, oppression, domination, suppression, and alienation. The advocacy researcher often begins with one of these issues as the focal point of research. This research also assumes that the inquirer will proceed collaboratively so as to not further marginalize the participants as a result of the inquiry. In this sense, the participants may help design questions, collect data, analyze information, or receive rewards for participating in the research. The "voice" for the participants becomes a united voice for reform and change. This advocacy may mean providing a voice for these participants, raising their consciousness, or advancing an agenda for change to improve the lives of the participants.

Within these knowledge claims are stances for groups and individuals in society that may be marginalized or disenfranchised. Therefore, theoretical perspectives may be integrated with the philosophical assumptions that construct a picture of the issues being examined, the people to be studied, and the changes that are needed. Some of these theoretical perspectives are listed below.

- *Feminist perspectives* center and make problematic women's diverse situations and the institutions that frame those situations. Research topics may include policy issues related to realizing social justice for women in specific contexts or knowledge about oppressive situations for women (Olesen, 2000).
- *Racialized discourses* raise important questions about the control and production of knowledge, particularly knowledge about people and communities of color (Ladson-Billings, 2000).
- *Critical theory* perspectives are concerned with empowering human beings to transcend the constraints placed on them by race, class, and gender (Fay, 1987).
- *Queer theory* focuses on individuals calling themselves lesbians, gay, bisexuals, or transgendered people. The research can be less objectifying, can be more concerned with cultural and political means, and can convey the voices and experiences of individuals who have been suppressed (Gamson, 2000).
- *Disability inquiry* addresses the meaning of inclusion in schools and encompasses administrators, teachers, and parents who have children with disabilities (Mertens, 1998).



These are diverse groups and topics, and my summaries here are inadequate generalizations. It is helpful to view the summary by Kemmis and Wilkinson (1998) of key features of the advocacy or participatory forms of inquiry:

1. Participatory action is recursive or dialectical and is focused on bringing about change in practices. Thus, at the end of advocacy/participatory studies, researchers advance an action agenda for change.
2. It is focused on helping individuals free themselves from constraints found in the media, in language, in work procedures, and in the relationships of power in educational settings. Advocacy/participatory studies often begin with an important issue or stance about the problems in society, such as the need for empowerment.
3. It is emancipatory in that it helps unshackle people from the constraints of irrational and unjust structures that limit self-development and self-determination. The aim of advocacy/participatory studies is to create a political debate and discussion so that change will occur.
4. It is practical and collaborative because it is inquiry completed "with" others rather than "on" or "to" others. In this spirit, advocacy/participatory authors engage the participants as active collaborators in their inquiries.

### *Pragmatic Knowledge Claims*

Another position about claims on knowledge comes from the pragmatists. Pragmatism derives from the work of Peirce, James, Mead, and Dewey (Cherryholmes, 1992). Recent writers include Rorty (1990), Murphy (1990), Patton (1990), and Cherryholmes (1992). There are many forms of pragmatism. For many of them, knowledge claims arise out of actions, situations, and consequences rather than antecedent conditions (as in postpositivism). There is a concern with applications—"what works"—and solutions to problems (Patton, 1990). Instead of methods being important, the problem is most important, and researchers use all approaches to understand the problem (see Rossman & Wilson, 1985). As a philosophical underpinning for mixed methods studies, Tashakkori and Teddlie (1998) and Patton (1990) convey the importance for focusing attention on the research

problem in social science research and then using pluralistic approaches to derive knowledge about the problem. According to Cherryholmes (1992), Murphy (1990), and my own interpretations of these writers, pragmatism provides a basis for the following knowledge claims:

1. Pragmatism is not committed to any one system of philosophy and reality. This applies to mixed methods research in that inquirers draw liberally from both quantitative and qualitative assumptions when they engage in their research.
2. Individual researchers have a freedom of choice. They are "free" to choose the methods, techniques, and procedures of research that best meet their needs and purposes.
3. Pragmatists do not see the world as an absolute unity. In a similar way, mixed methods researchers look to many approaches to collecting and analyzing data rather than subscribing to only one way (e.g., quantitative or qualitative).
4. Truth is what works at the time; it is not based in a strict dualism between the mind and a reality completely independent of the mind. Thus, in mixed methods research, investigators use both quantitative and qualitative data because they work to provide the best understanding of a research problem.
5. Pragmatist researchers look to the "what" and "how" to research based on its intended consequences—where they want to go with it. Mixed methods researchers need to establish a purpose for their "mixing," a rationale for the reasons why quantitative and qualitative data need to be mixed in the first place.
6. Pragmatists agree that research always occurs in social, historical, political, and other contexts. In this way, mixed methods studies may include a postmodern turn, a theoretical lens that is reflexive of social justice and political aims.
7. Pragmatists believe (Cherryholmes, 1992) that we need to stop asking questions about reality and the laws of nature. "They would simply like to change the subject" (Rorty, 1983, p. xiv).

Thus, for the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis in the mixed methods study.



Table 1.2 Alternative Strategies of Inquiry

| *Quantitative* | *Qualitative* | *Mixed Methods* |
|---|---|---|
| Experimental designs<br>Non-experimental designs, such as surveys | Narratives<br>Phenomenologies<br>Ethnographies<br>Grounded theory<br>Case studies | Sequential<br>Concurrent<br>Transformative |

## Strategies of Inquiry

The researcher brings to the choice of a research design assumptions about knowledge claims. In addition, operating at a more applied level are strategies of inquiry (or traditions of inquiry, Creswell, 1998; or methodologies, Mertens, 1998) that provide specific direction for procedures in a research design. Like knowledge claims, strategies have multiplied over the years as computer technology has pushed forward data analysis and the ability to analyze complex models, and as individuals have articulated new procedures for conducting social science research. These strategies of inquiry contribute to our overall research approach. The major strategies employed in the social sciences are discussed in Chapters 9, 10, and 11 of this book. Rather than cover all or a large number of strategies, these chapters focus on those frequently used in the social sciences. Here I will introduce those that will be discussed later and that are cited in examples of research throughout the book. An overview of these strategies is shown in Table 1.2.

### *Strategies Associated With the Quantitative Approach*

During the late 19th century and throughout the 20th, strategies of inquiry associated with quantitative research were those that invoked the postpositivist perspectives. These include the true experiments and the less rigorous experiments called quasi-experiments and correlational studies (Campbell & Stanley, 1963), and specific single-subject experiments (Cooper, Heron, & Heward, 1987; Neuman & McCormick, 1995). More recently, quantitative strategies involved complex experiments with many variables and treatments (e.g., factorial designs and repeated measure designs). They also included elaborate structural equation models that incorporated causal paths and the identification of the

collective strength of multiple variables. In this book, we will focus on two strategies of inquiry: experiments and surveys.

- *Experiments* include true experiments, with the random assignment of subjects to treatment conditions, as well as quasi-experiments that use nonrandomized designs (Keppel, 1991). Included within quasi-experiments are single-subject designs.
- *Surveys* include cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection, with the intent of generalizing from a sample to a population (Babbie, 1990).

### Strategies Associated With the Qualitative Approach

In qualitative research, the numbers and types of approaches also became more clearly visible during the 1990s. Books have summarized the various types (such as the 19 strategies identified by Wolcott, 2001), and complete procedures are now available on specific qualitative inquiry approaches. For example, Clandinin and Connelly (2000) have constructed a picture of what "narrative researchers do," Moustakas (1994) discussed the philosophical tenets and the procedures of the phenomenological method, and Strauss and Corbin (1990, 1998) have explicated the procedures of grounded theory. Wolcott (1999) has summarized ethnographic procedures, and Stake (1995) has identified the processes of case study research. In this book, illustrations will be drawn from the following strategies:

- *Ethnographies*, in which the researcher studies an intact cultural group in a natural setting over a prolonged period of time by collecting, primarily, observational data (Creswell, 1998). The research process is flexible and typically evolves contextually in response to the lived realities encountered in the field setting (LeCompte & Schensul, 1999).
- *Grounded theory*, in which the researcher attempts to derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study. This process involves using multiple stages of data collection and the refinement and interrelationship of categories of information (Strauss & Corbin, 1990, 1998). Two primary characteristics of this design are the constant comparison of data with emerging categories and theoretical sampling of different groups to maximize the similarities and the differences of information.



- *Case studies*, in which the researcher explores in depth a program, an event, an activity, a process, or one or more individuals. The case(s) are bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time (Stake, 1995).
- *Phenomenological research*, in which the researcher identifies the "essence" of human experiences concerning a phenomenon, as described by participants in a study. Understanding the "lived experiences" marks phenomenology as a philosophy as well as a method, and the procedure involves studying a small number of subjects through extensive and prolonged engagement to develop patterns and relationships of meaning (Moustakas, 1994). In this process, the researcher "brackets" his or her own experiences in order to understand those of the participants in the study (Nieswiadomy, 1993).
- *Narrative research*, a form of inquiry in which the researcher studies the lives of individuals and asks one or more individuals to provide stories about their lives. This information is then retold or restoried by the researcher into a narrative chronology. In the end, the narrative combines views from the participant's life with those of the researcher's life in a collaborative narrative (Clandinin & Connelly, 2000).

### Strategies Associated With the Mixed Methods Approach

Less well known than either the quantitative or qualitative strategies are those that involve collecting and analyzing both forms of data in a single study. The concept of mixing different methods probably originated in 1959, when Campbell and Fiske used multiple methods to study validity of psychological traits. They encouraged others to employ their "multimethod matrix" to examine multiple approaches to data collection in a study. This prompted others to mix methods, and soon approaches associated with field methods such as observations and interviews (qualitative data) were combined with traditional surveys (quantitative data) (S. D. Sieber, 1973). Recognizing that all methods have limitations, researchers felt that biases inherent in any single method could neutralize or cancel the biases of other methods. Triangulating data sources—a means for seeking convergence across qualitative and quantitative methods—were born (Jick, 1979). From the original concept of triangulation emerged additional reasons for mixing different types of data. For example, the results from one method can

help develop or inform the other method (Greene, Caracelli, & Graham, 1989). Alternatively, one method can be nested within another method to provide insight into different levels or units of analysis (Tashakkori & Teddlie, 1998). Or the methods can serve a larger, transformative purpose to change and advocate for marginalized groups, such as women, ethnic/racial minorities, members of gay and lesbian communities, people with disabilities, and those who are poor (Mertens, 2003).

These reasons for mixing methods have led writers from around the world to develop procedures for mixed methods strategies of inquiry and to take the numerous terms found in the literature, such as multimethod, convergence, integrated, and combined (Creswell, 1994) and shape procedures for research (Tashakkori & Teddlie, 2003).

In particular, three general strategies and several variations within them will be illustrated in this book:

- *Sequential* procedures, in which the researcher seeks to elaborate on or expand the findings of one method with another method. This may involve beginning with a qualitative method for exploratory purposes and following up with a quantitative method with a large sample so that the researcher can generalize results to a population. Alternatively, the study may begin with a quantitative method in which theories or concepts are tested, to be followed by a qualitative method involving detailed exploration with a few cases or individuals.

- *Concurrent* procedures, in which the researcher converges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. In this design, the investigator collects both forms of data at the same time during the study and then integrates the information in the interpretation of the overall results. Also, in this design, the researcher nests one form of data within another, larger data collection procedure in order to analyze different questions or levels of units in an organization.

- *Transformative* procedures, in which the researcher uses a theoretical lens (see Chapter 7) as an overarching perspective within a design that contains both quantitative and qualitative data. This lens provides a framework for topics of interest, methods for collecting data, and outcomes or changes anticipated by the study. Within this lens could be a data collection method that involves a sequential or a concurrent approach.



| *Quantitative Research Methods* | *Qualitative Research Methods* | *Mixed Methods Research Methods* |
|---|---|---|
| Predetermined<br>Instrument based questions<br>Performance data, attitude data, observational data, and census data<br>Statistical analysis | Emerging methods<br>Open-ended questions<br>Interview data, observation data, document data, and audiovisual data<br>Text and image analysis | Both predetermined and emerging methods<br>Both open- and closed-ended questions<br>Multiple forms of data drawing on all possibilities<br>Statistical and text analysis |

## Research Methods

The third major element that goes into a research approach is the specific methods of data collection and analysis. As shown in Table 1.3, it is useful to consider the full range of possibilities for data collection in any study, and to organize these methods by their degree of predetermined nature, their use of closed-ended versus open-ended questioning, and their focus for numeric versus non-numeric data analysis. These methods will be developed further in Chapters 9 through 11 as quantitative, qualitative, and mixed methods.

Researchers collect data on an instrument or test (e.g., a set of questions about attitudes toward self-esteem) or gather information on a behavioral checklist (e.g., where researchers observe a worker engaged in using a complex skill). On the other end of the continuum, it might involve visiting a research site and observing the behavior of individuals without predetermined questions or conducting an interview in which the individual is allowed to talk openly about a topic largely without the use of specific questions. The choice of methods by a researcher turns on whether the intent is to specify the type of information to be collected in advance of the study or to allow it to emerge from participants in the project. Also, the type of data may be numeric information gathered on scales of instruments or more text information, recording and reporting the voice of the participants. In some forms of data collection, both quantitative and qualitative data are collected. Instrument data may

be augmented with open-ended observations, or census data may be followed by in-depth exploratory interviews.

## THREE APPROACHES TO RESEARCH

The knowledge claims, the strategies, and the method all contribute to a research approach that *tends* to be more quantitative, qualitative, or mixed. Table 1.4 creates distinctions that may be useful in choosing an approach for a proposal. This table also includes practices of all three approaches that will be emphasized in the remaining chapters of this book.

Definitions can help further clarify the three approaches:

- A *quantitative* approach is one in which the investigator primarily uses postpositivist claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data.

- Alternatively, a *qualitative* approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e., the multiple meanings of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/participatory perspectives (i.e., political, issue-oriented, collaborative, or change oriented) or both. It also uses strategies of inquiry such as narratives, phenomenologies, ethnographies, grounded theory studies, or case studies. The researcher collects open-ended, emerging data with the primary intent of developing themes from the data.

- Finally, a *mixed methods* approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The

**Table 1.4 Qualitative, Quantitative, and Mixed Methods Approaches**

| *Tend to or Typically* | *Qualitative Approaches* | *Quantitative Approaches* | *Mixed Methods Approaches* |
|---|---|---|---|
| Use these philosophical assumptions<br>Employ these strategies of inquiry | Constructivist/Advocacy/ Participatory knowledge claims<br>Phenomenology, grounded theory, ethnography, case study, and narrative | Postpositivist knowledge claims<br>Surveys and experiments | Pragmatic knowledge claims<br>Sequential, concurrent, and transformative |
| Employ these methods | Open-ended questions, emerging approaches, text or image data | Closed-ended questions, predetermined approaches, numeric data | Both open- and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis |
| Use these practices of research, as the researcher | Positions himself or herself<br>Collects participant meanings<br>Focuses on a single concept or phenomenon<br>Brings personal values into the study<br>Studies the context or setting of participants<br>Validates the accuracy of findings<br>Makes interpretations of the data<br>Creates an agenda for change or reform<br>Collaborates with the participants | Tests or verifies theories or explanations<br>Identifies variables to study<br>Relates variables in questions or hypotheses<br>Uses standards of validity and reliability<br>Observes and measures information numerically<br>Uses unbiased approaches<br>Employs statistical procedures | Collects both quantitative and qualitative data<br>Develops a rationale for mixing<br>Integrates the data at different stages of inquiry<br>Presents visual pictures of the procedures in the study<br>Employs the practices of both qualitative and quantitative research |

| *Research Approach* | *Knowledge Claims* | *Strategy of Inquiry* | *Methods* |
|---|---|---|---|
| Quantitative | Postpositivist assumptions | Experimental design | Measuring attitudes, rating behaviors |
| Qualitative | Constructivist assumptions | Ethnographic design | Field observations |
| Qualitative | Emancipatory assumptions | Narrative design | Open-ended interviewing |
| Mixed methods | Pragmatic assumptions | Mixed methods design | Closed-ended measures, open-ended observations |

**Figure 1.2** Four Alternative Combinations of Knowledge Claims, Strategies of Inquiry, and Methods

data collection also involves gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information.

To see how these three elements (knowledge claims, strategies, and methods) combine in practice, I have drafted several typical scenarios of research, as shown in Figure 1.2.

- *Quantitative* approach: postpositivist knowledge claims, experimental strategy of inquiry, and pre- and posttest measures of attitudes

In this scenario, the researcher tests a theory by specifying narrow hypotheses and the collection of data to support or refute the hypotheses. An experimental design is used in which attitudes are assessed both before and after an experimental treatment. The data are collected on an instrument that measures attitudes, and the information collected is analyzed using statistical procedures and hypothesis testing.

- *Qualitative* approach: constructivist knowledge claims, ethnographic design, and observation of behavior

In this situation the researcher seeks to establish the meaning of a phenomenon from the views of participants. This means identifying a



culture-sharing group and studying how it developed shared patterns of behavior over time (i.e., ethnography). One of the key elements of collecting data is to observe participants' behaviors by participating in their activities.

- *Qualitative* approach: participatory knowledge claims, narrative design, and open-ended interviewing

For this study, the inquirer seeks to examine an issue related to oppression of individuals. To study this, the approach is taken of collecting stories of individual oppression using a narrative approach. Individuals are interviewed at some length to determine how they have personally experienced oppression.

- *Mixed methods* approach: pragmatic knowledge claims, collection of both quantitative and qualitative data sequentially

The researcher bases the inquiry on the assumption that collecting diverse types of data best provides an understanding of a research problem. The study begins with a broad survey in order to generalize results to a population and then focuses, in a second phase, on detailed qualitative, open-ended interviews to collect detailed views from participants.

## CRITERIA FOR SELECTING AN APPROACH

Given these three approaches, what factors affect a choice of one approach over another for the design of a proposal? Three considerations play into this decision: the research problem, the personal experiences of the researcher, and the audience(s) for whom the report will be written.

### Match Between Problem and Approach

Certain types of social research problems call for specific approaches. A research problem, as discussed in Chapter 4, is an issue or concern that needs to be addressed (e.g., whether one type of intervention works better than another type of intervention). For example, if the problem is identifying factors that influence an outcome, the utility of an

intervention, or understanding the best predictors of outcomes, then a quantitative approach is best. It is also the best approach to use to test a theory or explanation. On the other hand, if a concept or phenomenon needs to be understood because little research has been done on it, then it merits a qualitative approach. Qualitative research is exploratory and is useful when the researcher does not know the important variables to examine. This type of approach may be needed because the topic is new, the topic has never been addressed with a certain sample or group of people, or existing theories do not apply with the particular sample or group under study (Morse, 1991).

A mixed methods design is useful to capture the best of both quantitative and qualitative approaches. For example, a researcher may want to both generalize the findings to a population and develop a detailed view of the meaning of a phenomenon or concept for individuals. In this research, the inquirer first explores generally to learn about what variables to study and then studies those variables with a large sample of individuals. Alternatively, researchers may first survey a large number of individuals, then follow up with a few of them to obtain their specific language and voices about the topic. In these situations, the advantages of collecting both closed-ended quantitative data and open-ended qualitative data prove advantageous to best understand a research problem.

## Personal Experiences

Into this mix of choice also comes the researcher's own personal training and experiences. An individual trained in technical, scientific writing, statistics, and computer statistical programs who is also familiar with quantitative journals in the library would most likely choose the quantitative design. The qualitative approach incorporates much more of a literary form of writing, computer text analysis programs, and experience in conducting open-ended interviews and observations. The mixed methods researcher needs to be familiar with both quantitative and qualitative research. This person also needs an understanding of the rationales for combining both forms of data so that they can be articulated in a proposal. The mixed methods approach also requires knowledge about the different mixed methods designs that help organize procedures for a study.

Because quantitative studies are the traditional mode of research, carefully worked out procedures and rules exist for the research. This



means that researchers may be more comfortable with the highly systematic procedures of quantitative research. Also, for some individuals, it can be uncomfortable to challenge accepted approaches among some faculty by using qualitative and advocacy/participatory approaches to inquiry. On the other hand, qualitative approaches allow room to be innovative and to work more within researcher-designed frameworks. They allow more creative, literary-style writing, a form that individuals may like to use. For advocacy/participatory writers, there is undoubtedly a strong personal stimulus to pursue topics that are of personal interest—issues that relate to marginalized people and an interest in creating a better society for them and everyone.

For the mixed methods researcher, a project will take extra time because of the need to collect and analyze both quantitative and qualitative data. It fits a person who enjoys both the structure of quantitative research and the flexibility of qualitative inquiry.

## Audience

Finally, researchers are sensitive to audiences to whom they report their research. These audiences may be journal editors, journal readers, graduate committees, conference attendees, or colleagues in the field. Students should consider the approaches typically supported and used by their advisers. The experiences of these audiences with quantitative, qualitative, or mixed methods studies will shape the decision made about this choice.


One preliminary consideration before designing a proposal is to identify a framework for the study. Three approaches to research are discussed in this chapter: quantitative, qualitative, and mixed methods research. They contain philosophical assumptions about knowledge claims, strategies of inquiry, and specific research methods. When philosophy, strategies, and methods are combined, they provide different frameworks for conducting research. The choice of which approach to use is based on the research problem, personal experiences, and the audiences for whom one seeks to write.

WRITING EXERCISES

## Writing Exercises

1. Identify a research question in a journal article and discuss what approach would be best to study the question and why.
2. Take a topic that you would like to study, and, using the four combinations of knowledge claims, strategies of inquiry, and methods in Figure 1.2, discuss how the topic might be studied using each of the combinations.
3. Locate a journal article that is either quantitative, qualitative, or mixed methods research. Identify the "markings" as to why it would be one approach and not the others.

## ADDITIONAL READINGS

**Cherryholmes, C. H. (1992). Notes on pragmatism and scientific realism. *Educational Researcher,14*, August-September, 13-17.**

Cleo Cherryholmes contrasts pragmatism with traditional scientific research. The strengths of this article are the numerous citations to writers about pragmatism and a clarification of the alternative versions of pragmatism. Cherryholmes clarifies his own stance by indicating that pragmatism is driven by anticipated consequences, a reluctance to tell a true story, and the idea that there is an external world independent of our minds.

**Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London: Sage.**

Michael Crotty offers a useful framework for tying together the many epistemological issues, theoretical perspectives, methodology, and methods of social research. He interrelates the four components of the research process and shows in Table 1 a representative sampling of topics of each component. He then goes on to discuss nine different theoretical orientations in social research, such as postmodernism, feminism, critical inquiry, interpretivism, constructionism, and positivism.



**Kemmis, S., & Wilkinson, M. (1998). Participatory action research and the study of practice. In B. Atweh, S. Kemmis, & P. Weeks (Eds.), *Action research in practice: Partnerships for social justice in education* (pp. 21-36). New York: Routledge.**

Stephen Kemmis and Mervyn Wilkinson provide an excellent overview of participatory research. In particular, they note the six major features of this inquiry approach and then discuss how action research is practiced at the individual, the social, or both levels.

**Lincoln, Y. S., & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and emerging confluences. In N. K. Denzin, Y. S. Lincoln, & E. G. Guba (Eds.), *Handbook of qualitative research* (2nd ed., pp. 163-188). Thousand Oaks, CA: Sage.**

Yvonna Lincoln and Egon Guba have provided the basic beliefs of five alternative inquiry paradigms in social science research. These extend the earlier analysis provided in the first edition of the *Handbook* and include positivism, postpositivism, critical theory, constructivism, and participatory paradigms. Each is presented in terms of ontology (i.e., nature of reality), epistemology (i.e., how we know what we know), and methodology (i.e., the process of research). The participatory paradigm adds another alternative paradigm to those originally advanced in the first edition. After briefly presenting these five approaches, the authors contrast them in terms of seven issues, such as the nature of knowledge and how knowledge accumulates.

**Neuman, W. L. (2000). *Social research methods: Qualitative and quantitative aproaches* (4th ed.). Boston: Allyn and Bacon.**

Lawrence Neuman provides a comprehensive research methods text as an introduction to social science research. Especially helpful in understanding the alternative meaning of methodology is Chapter 4, titled "The Meanings of Methodology," in which he contrasts three methodologies—positivist social science, interpretive social science, and critical social science—in terms of eight

questions (e.g., What constitutes an explanation or theory of social reality? What does good evidence or factual information look like?)

**Phillips, D. C., & Burbules, N. C. (2000). *Postpositivism and educational research*. Lanham, MD: Rowman & Littlefield.**

D. C. Phillips and Nicholas Burbules summarize the major ideas of postpositivist thinking. Through two chapters, "What Is Postpositivism?" and "Philosophical Commitments of Postpositivist Researchers," the authors advance major ideas about postpositivism, especially those that differentiate it from positivism. These include knowing that human knowledge is conjectural rather than unchallengeable, and that our warrants for knowledge can be withdrawn in light of further investigations.

CHAPTER TWO

# Review of the Literature

In addition to selecting a quantitative, qualitative, or mixed methods approach, the proposal designer also needs to begin reviewing the scholarly literature. Literature reviews help researchers limit the scope of their inquiry, and they convey the importance of studying a topic to readers.

This chapter continues the discussion about preliminary choices to be made before launching into a proposal. It begins with a discussion about selecting a topic and writing this topic down so that the researcher can continually reflect on it. At this point, researchers also need to consider whether the topic *can* and *should* be researched. Then, the discussion moves into the actual process of reviewing the literature. It begins by addressing the general purpose for using literature in a study, then turns to principles helpful in providing a literature review in qualitative, quantitative, and mixed methods studies.

## IDENTIFYING A TOPIC

Before considering what literature to use in a project, first identify a topic to study and reflect on whether it is practical and useful to undertake the study. Describe the topic in a few words or in a short phrase. The topic becomes the central idea to learn about or to explore in a study.

There are several ways in which researchers often gain some insight into their topic when they are beginning their research. My assumption will be that the topic is chosen by the researcher and not by an adviser or committee member. Several strategies can help start the process of identifying a topic.

One way is to draft a brief title for the study. I am surprised at how often researchers fail to draft a title early in their projects. In my opinion, the "working title" becomes a major road sign in research—a tangible idea to keep refocusing on and changing as the project goes on

## ADDITIONAL READINGS

**Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Merrill/Pearson.**

In this methods text, I devote a section of one chapter to the topic of writing a purpose statement. The text includes a "script" for both quantitative and qualitative purpose statements. For identifying types of quantitative variables, the discussion provides a conceptual framework called the "family" of variables. The book provides several examples of both quantitative and qualitative purpose statements from the literature of education.

**Marshall, C., & Rossman, G. B. (1999). *Designing qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.**

Catherine Marshall and Gretchen Rossman call attention to the major intent of the study, the "purpose of the study." This section is generally embedded in the discussion of the topic, and it is mentioned in a sentence or two. It tells the reader what the results of the research are likely to accomplish. The authors characterize purposes as exploratory, explanatory, descriptive, and emanicipatory. They also mention that the purpose statement includes the unit of analysis (e.g., individuals, dyads, or groups).

**Wilkinson, A. M. (1991). *The scientist's handbook for writing papers and dissertations*. Englewood Cliffs, NJ: Prentice Hall.**

Antoinette Wilkinson calls the purpose statement the "immediate objective" of the research study. She states that the purpose of the "objective" is to answer the research question. Further, the "objective" of the study needs to be presented in the introduction to a study, although it may be implicitly stated as the subject of the research, the paper, or the method. If stated explicitly, the "objective" is found at the end of the argument in the introduction; it might also be found near the beginning or in the middle, depending on the structure of the introduction.

CHAPTER SIX

# Research Questions and Hypotheses

Investigators place signposts in their research to carry the reader through a plan for a study. The first signpost is the purpose statement, which establishes the central direction for the study. From the broad, general purpose statement, the researcher narrows the focus to specific questions to be answered or predictions (i.e., hypotheses) to be tested. This chapter addresses the second signpost—the research questions, or hypotheses—in a proposal. The discussion begins by advancing several principles involved in designing qualitative research questions; quantitative research questions, objectives, and hypotheses; and finally, mixed methods research questions.

## QUALITATIVE RESEARCH QUESTIONS

In a qualitative study, inquirers state research questions, not objectives (i.e., specific goals for the research) or hypotheses (i.e., predictions that involve variables and statistical tests). These research questions assume two forms: a central question and associated subquestions.

The central question is a statement of the question being examined in the study in its most general form. The inquirer poses this question, consistent with the emerging methodology of qualitative research, as a general issue so as to not limit the inquiry. One might ask "What is the broadest question that can be asked in the study?" Beginning researchers trained in *quantitative* research might struggle with this approach because they are accustomed to the reverse logic: identifying specific questions or hypotheses. The following are guidelines for writing broad, qualitative research questions:

- I recommend that a researcher ask one or two central questions followed by no more than five to seven subquestions. Several subquestions follow each general central question, and the subquestions narrow the focus of the study but leave open the questioning. This approach is well within the limits set by Miles and Huberman (1994), who recommend that researchers write no more than a dozen research questions in all. These questions, in turn, become topics specifically explored in interviews, observations, and documents and archival material. For example, they might be used as key questions the researcher will ask himself or herself in the observational procedure or during an open-ended interview.

- Relate the central question to the specific qualitative strategy of inquiry. For example, the specificity of the questions in ethnography at this stage of the design differs from that in other qualitative strategies. In ethnographic research, Spradley (1980) advanced a taxonomy of ethnographic questions that included mini-tour, experience, native-language, contrast, and verification questions. Similarly, in critical ethnography, the research questions may build on a body of existing literature. These questions become "working guidelines" rather than "truths" to be proven (Thomas, 1993, p. 35). Alternatively, in phenomenology, the questions might be broadly stated without specific reference to the existing literature or a typology of questions. An example is "What is it like for a mother to live with a teenage child who is dying of cancer?" (Nieswiadomy, 1993, p. 151). In grounded theory, the questions may be related to procedures in the data analysis such as open coding ("What are the categories to emerge from interactions between caregivers and patients?") or axial coding ("How does caregiving relate to actions by nurses?").

- Begin the research questions with the words "what" or "how" to convey an open and emerging design. "Why" suggests cause and effect, an approach consistent with *quantitative* research.

- Focus on a single phenomenon or concept.

- Use exploratory verbs that convey the language of emerging design of research. These verbs tell the reader that the study will
  - Discover (e.g., grounded theory)
  - Seek to understand (e.g., ethnography)
  - Explore a process (e.g., case study)
  - Describe the experiences (e.g., phenomenology)
  - Report the stories (e.g., narrative research)



- Use nondirectional language. Delete words that suggest or infer a *quantitative* study, words with a directional orientation such as "affect," "influence," "impact," "determine," "cause," and "relate."

- Expect the research questions to evolve and to change during the study in a manner consistent with the assumptions of an emerging design. Often in *qualitative* studies, the questions are under continual review and reformulation (as in a grounded theory study). This approach may be problematic for individuals accustomed to *quantitative* designs, in which the research questions remain fixed throughout the study.

- Use open-ended questions without reference to the literature or theory unless otherwise indicated by a qualitative strategy of inquiry.

- If the information is not redundant with the purpose statement, specify the participants and the research site for the study.

The following are examples of qualitative research questions drawing on several types of strategies.

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**Example 6.1** *A Qualitative Central Question From an Ethnography*

Finders (1996) used ethnographic procedures to document the reading of teen magazines by middle-class Euro-American seventh-grade girls. By examining the reading of teen zines (magazines), the researcher could explore how the girls perceive and construct their social roles and relationships as they enter junior high school. She asked one guiding central question in her study:

> How do early adolescent females read literature that falls outside the realm of fiction? (Finders, 1996, p. 72)

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This central question begins with "how"; it uses an open-ended verb, "read"; it focuses on a single concept, the "literature" or teen magazines; and it mentions the participants, adolescent females, in the study. Notice how the author crafted a concise, single question that needed to be answered in the study.

**Example 6.2** *Central Questions From a Case Study*

Padula and Miller (1999) conducted a multiple case study that described the experiences of women who went back to school, after a time away, in a psychology doctoral program at a major Midwestern research university. The intent was to document the women's experiences, with those experiences intended as aids for feminists and feminist researchers. The authors asked three central questions that guided the inquiry.

> (a) How do women in a psychology doctoral program describe their decision to return to school? (b) How do women in a psychology doctoral program describe their reentry experiences? And (c) How does returning to graduate school change these women's lives? (Padula & Miller, 1999, p. 328)

These three central questions all begin with the words "how," they include open-ended verbs such as "describe," and they focus on three areas of the doctoral experience—returning to school, reentering, and changing. They also mention the participants as women in a single doctoral program at a Midwestern research university.

## QUANTITATIVE RESEARCH QUESTIONS AND HYPOTHESES

In quantitative studies, investigators use research questions and hypotheses to shape and specifically focus the purpose of the study. Research questions are interrogative statements or questions that the investigator seeks to answer. They are used frequently in social science research and especially in survey studies. Hypotheses, on the other hand, are predictions the researcher holds about the relationship among variables. They are numeric estimates of population values based on data collected from samples. Testing of hypotheses employs statistical procedures in which the investigator draws inferences about the population from a study sample. Hypotheses typically are used in experiments in which investigators compare groups. Advisers often recommend their use in a formal research project, such as a dissertation



or thesis, as a means of stating the direction a study will take. Objectives, on the other hand, indicate the goals or objectives for a study. They are used infrequently in social science research. As such, the focus here will be on research questions and hypotheses.

Guidelines for writing good quantitative research questions and hypotheses include the following.

- The use of variables in research questions or hypotheses is typically limited to three basic approaches. The researcher may *compare* groups on an independent variable to see its impact on a dependent variable. Alternatively, the investigator may *relate* one or more independent variables to a dependent variable. Third, the researcher may *describe* responses to the independent, mediating, or dependent variables.
- The most rigorous form of quantitative research follows from a test of a theory (see Chapter 7) and the specification of research questions or hypotheses that are included in the theory.
- The independent and dependent variables must be measured separately. This procedure reinforces the cause and effect logic of quantitative research.
- To eliminate redundancy, write only research questions or hypotheses, not both, unless the hypotheses build on the research questions (as discussed below). Choose the form based on tradition, recommendations from an adviser or faculty committee, or whether past research indicates a prediction about outcomes.
- If hypotheses are used, there are two forms: null and alternative. A *null hypothesis* represents the traditional approach to writing hypotheses. It makes a prediction that in the general population, no relationship or no difference exists between groups on a variable. The wording is "There is no difference (or relationship)" between the groups. The following example illustrates a null hypothesis.

**Example 6.3** *A Null Hypothesis*

An investigator might examine three types of reinforcement for children with autism: verbal cues, a reward, and no reinforcement. Then the investigator collects behavioral measures assessing social interaction of the children with their siblings. A null hypothesis might read:

There is no significant difference between the effects of verbal cues, rewards, and no reinforcement in terms of social interaction for children with autism and their siblings.

- The second form of hypothesis, popular in journal articles, is the *alternative hypothesis*. The investigator makes a prediction about the expected outcome for the population of the study. This prediction often comes from prior literature and studies on the topic that suggest a potential outcome that the researcher may expect. For example, the researcher may predict that "Scores will be higher for Group A than for Group B" on the dependent variable or that "Group A will change more than Group B" on the outcome. These examples illustrate a *directional hypothesis*, because an expected prediction (e.g., higher, change more) is made. Another type of alternative hypothesis is *nondirectional*—a prediction is made, but the exact form of differences (e.g., higher, lower, more, or less) is not specified because the researcher does not know what can be predicted from past literature. Thus, the investigator might write, "There is a difference" between the two groups. The following illustrates a directional hypothesis.

### Example 6.4 *Directional Hypotheses*

Mascarenhas (1989) studied the differences between type of ownership (state-owned, publicly traded, and private) of firms in the offshore drilling industry. Specifically, the study explored such differences as domestic market dominance, international presence, and customer orientation. The study was a "controlled field study" using quasi-experimental procedures.

Hypothesis 1: Publicly traded firms will have higher growth rates than privately held firms.

Hypothesis 2: Publicly traded enterprises will have a larger international scope than state-owned and privately held firms.

Hypothesis 3: State-owned firms will have a greater share of the domestic market than publicly traded or privately held firms.

Hypothesis 4: Publicly traded firms will have broader product lines than state-owned and privately held firms.

Hypothesis 5: State-owned firms are more likely to have state-owned enterprises as customers overseas.



Hypothesis 6: State-owned firms will have a higher customer-base stability than privately held firms.

Hypothesis 7: In less visible contexts, publicly traded firms will employ more advanced technology than state-owned and privately held firms. (Mascarenhas, 1989, pp. 585-588)

### Example 6.5 *Nondirectional and Directional Hypotheses*

Sometimes directional hypotheses are created to examine the relationship among variables rather than to compare groups. For example, Moore (2000) studied the meaning of gender identity for religious and secular Jewish and Arab women in Israeli society. In a national probability sample of Jewish and Arab women, the author identified three hypotheses for study. The first hypothesis is nondirectional and the last two are directional.

$H_1$: Gender identity of religious and secular Arab and Jewish women are related to different sociopolitical social orders that reflect the different value systems they embrace.

$H_2$: Religious women with salient gender identity are less sociopolitically active than secular women with salient gender identities.

$H_3$: The relationships among gender identity, religiosity, and social actions are weaker among Arab women than among Jewish women.

- Unless the study intentionally employs demographic variables as predictors, use nondemographic variables (i.e., measuring attitudes or behaviors) rather than personal demographics as independent variables. Because quantitative studies attempt to verify a theory, demographic variables (e.g., age, income level, educational level, and so forth) typically enter these models as intervening or control variables instead of major independent variables.

- Use the same pattern of word order in the questions or hypotheses to enable a reader to easily identify the major variables. This calls for repeating key phrases and positioning the variables beginning with the independent and concluding with the dependent variables (as also discussed in Chapter 5 on good purpose statements). An

example of word order with independent variables stated first in the phrase follows.

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**Example 6.6** *Standard Use of Language in Hypotheses*

1. *There is no relationship between* utilization of ancillary support services and academic persistence for non-traditional women college students.
2. *There is no relationship* between family support systems and academic persistence for non-traditional aged college women.
3. *There is no relationship between* ancillary support services and family support systems for non-traditional college women.

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## A Model for Descriptive Questions and Hypotheses

Consider a model for writing questions or hypotheses based on writing descriptive questions that are followed by inferential questions or hypotheses. These questions or hypotheses include both independent and dependent variables. In this model, the writer specifies descriptive questions for *each* independent and dependent variable (and important control or intervening variables) in the study. Inferential questions (or hypotheses) that relate variables or compare groups follow these descriptive questions. A final set of questions, then, may add inferential questions or hypotheses in which variables are controlled.

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**Example 6.7** *Descriptive and Inferential Questions*

To illustrate this approach, assume that a researcher wants to examine the relationship of critical thinking skills (an independent variable measured on an instrument) to student achievement (a dependent variable measured by grades) in science classes for eighth-grade students in a large metropolitan school district. Further, this researcher controls for the intervening effects of prior grades in science classes and parents' educational attainment. Following the model proposed above, the research questions might be written as follows:



### Descriptive Questions

1. How do the students rate on critical thinking skills? (A descriptive question focused on the independent variable)
2. What are the student's achievement levels (or grades) in science classes? (A descriptive question focused on the dependent variable)
3. What are the student's prior grades in science classes? (A descriptive question focused on the control variable of prior grades)
4. What is the educational attainment of the parents of the eighth-graders? (A descriptive question focused on another control variable, educational attainment of parents)

### Inferential Questions

5. Does critical thinking ability relate to student achievement? (An inferential question relating the independent and the dependent variables)
6. Does critical thinking ability relate to student achievement, controlling for the effects of prior grades in science and the educational attainment of the eighth-graders' parents? (An inferential question relating the independent and the dependent variables, controlling for the effects of the two controlled variables)

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This example illustrates how to organize all the research questions into descriptive and inferential questions. In another example, a researcher may want to compare groups, and the language may change to reflect this comparison in the inferential questions. In other studies, many more independent and dependent variables may be present in the model being tested, and a longer list of descriptive and inferential questions would result. I would recommend this descriptive-inferential model.

This example also illustrates the use of variables to describe as well as relate. It specifies the independent variables in the first position in the questions, the dependent in the second, and the control variables in the third position. It employs demographics as controls rather than central variables in the questions, and a reader needs to assume that the questions flow from a theoretical model.

## MIXED METHODS RESEARCH QUESTIONS AND HYPOTHESES

Mixed methods research presents challenges in writing research questions (or hypotheses) because so little of the literature has addressed this design step (Creswell, 1999). Authors prefer to make purpose statements rather than specify their research questions. Thus, there is a distinct lack of models on which to base guidelines for writing research questions into mixed methods studies. By examining a number of these studies, however, it is possible to identify some characteristics that might guide the design of the questions.

- Mixed methods studies need to have both qualitative and quantitative research questions (or hypotheses) included in the studies to narrow and focus the purpose statements.
- These questions and hypotheses need to incorporate the elements of good questions and hypotheses already addressed in the quantitative and qualitative approaches.
- In a two-phase, sequential project in which the second phase elaborates on the first phase, it is difficult to specify the second-phase questions in a proposal or plan. After the study is completed, the researcher can state the questions of both phases in the final report. In a single-phase project, it is possible to identify the qualitative and quantitative research questions in the proposal because one set of questions is not contingent on the other set of questions.
- Some attention should be given to the order of the research questions and hypotheses. In a two-phase project, the order would consist of the first-phase questions followed by the second-phase questions so that readers see them in the order in which they will be addressed in the proposed study. In a single-phase strategy of inquiry, the questions might be ordered according to the method that is given the most weight in the design.
- A variation often seen in sequential mixed methods studies is to introduce the questions at the beginning of each phase. For example, assume that the study begins with a quantitative phase. The investigator might introduce hypotheses. Later in the study, when the qualitative phase is addressed, the qualitative research questions appear.



**Example 6.8** *Hypotheses and Research Questions in a Mixed Methods Study*

Houtz (1995) provides an example of a two-phase study with the research hypotheses and questions stated in sections introducing each phase. Her study investigated the differences between middle-school (nontraditional) and junior high (traditional) instructional strategies for seventh- and eighth-grade students and their attitudes toward science and their science achievement. In this two-phase study, the first phase involved assessing pre- and posttest attitudes and achievement using scales and examination scores. Houtz then followed the quantitative results with qualitative interviews with science teachers, the school principal, and consultants. This second phase helped to explain differences and similarities in the two instructional approaches obtained in the first phase.

With a first-phase quantitative study, Houtz mentioned the hypotheses guiding her research:

> It was hypothesized that there would be no significant difference between students in the middle school and those in the junior high in attitude toward science as a school subject. It was also hypothesized that there would be no significant difference between students in the middle school and those in the junior high in achievement in science. (Houtz, 1995, p. 630)

These hypotheses appeared at the beginning of the study as an introduction to the quantitative phase of the study. Prior to the qualitative phase, Houtz raised questions to explore the quantitative results. Focusing in on the achievement test results, Houtz interviewed science teachers, the principal, and the university consultants and asked three questions:

> What differences currently exist between the middle school instructional strategy and the junior high instructional strategy at this school in transition? How has this transition period impacted science attitude and achievement of your students? How do teachers feel about this change process? (Houtz, 1995, p. 649)

Examining this mixed methods study shows that the author included both quantitative and qualitative questions, specified them at the beginning of each phase of her study, and used good elements for writing both quantitative hypotheses and qualitative research questions.

## SUMMARY

Research questions and hypotheses narrow the purpose statement and become major signposts for readers of research. Qualitative researchers ask at least one central question and several subquestions. They begin the questions with words such as "how" or "what" and use exploratory verbs, such as "explore" or "describe." They pose broad, general questions to allow the participants to explain their ideas. They also focus initially on one central phenomenon of interest. The questions may mention the participants and the site for the research.

Quantitative researchers write either research questions or hypotheses. These questions or hypotheses include variables that are described, related, categorized into groups for comparison, and measured separately for the independent and dependent variables. In many quantitative proposals, writers use research questions; however, a more formal statement of research employs hypotheses. These hypotheses are predictions about the outcomes of the results, and they may be written as alternative hypotheses specifying the exact results to be expected (more or less, higher or lower of something). They also may be stated in the null form, indicating no difference or no relationship between groups on a dependent variable. Typically in questions and hypotheses, the researcher writes the independent variable(s) first, followed by the dependent variable(s). One model for ordering all the questions in a quantitative proposal is to begin with descriptive questions, followed by the inferential questions that relate variables or compare groups.

Mixed methods research questions should address both the qualitative and the quantitative components in a study. In a proposal, it is difficult to be specific about the second-phase questions when these questions will build or elaborate on the first-phase questions. Typically, if both qualitative and quantitative questions are introduced in a study, their order of sequence in the study suggests their priority in the study. Also, the weight given to the qualitative and quantitative phases will dictate the order of the questions. Finally, one model found in mixed methods studies involves writing the research questions as an introduction to each phase in the study rather than presenting them all at the beginning of the study.





## Writing Exercises

1. For a qualitative study, write one or two central questions followed by five to seven subquestions.
2. For a quantitative study, write two sets of questions. The first set should be descriptive questions about the independent and dependent variables in the study. The second set should pose questions that relate (or compare) the independent variable(s) with the dependent variable(s). This follows the model presented in this chapter for combining descriptive and inferential questions.
3. Write research questions for a two-phase, sequential mixed methods project. Include the elements of good questions in both the qualitative and quantitative questions.
4. Return to the working draft of your title. Retitle your study to reflect a qualitative or quantitative approach to the study. To write a qualitative title, consider the suggestions in Chapter 2 and be sure to include the central phenomenon. Use a literary style such as a question. To write a quantitative title, include the major independent and dependent variables and separate them with the conjunction "and." Order the variables from independent to dependent so that they are consistent with the purpose statement and research questions/hypotheses.

## ADDITIONAL READINGS

**Creswell, J. W. (1999). Mixed-method research: Introduction and application. In G. J. Cizek (Ed.), *Handbook of educational policy* (pp. 455-472). San Diego: Academic Press.**

In this chapter, I discuss the nine steps in conducting a mixed methods study. These are as follows:

1. determine if a mixed methods study is needed to study the problem;

2. consider whether a mixed methods study is feasible;
3. write both qualitative and quantitative research questions;
4. review and decide on the types of data collection;
5. assess the relative weight and implementation strategy for each method;
6. present a visual model;
7. determine how the data will be analyzed;
8. assess the criteria for evaluating the study; and
9. develop a plan for the study.

In writing the research questions, I recommend developing both qualitative and quantitative questions, and stating within the questions the type of qualitative strategy of inquiry being used.

**Morse, J. M. (1994). Designing funded qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 220-235). Thousand Oaks, CA: Sage.**

Janice Morse, a nursing researcher, identifies and describes the major design issues involved in the planning of a qualitative project. She compares several strategies of inquiry and maps the type of research questions used in each strategy. For phenomenology and ethnography, the research calls for meaning and descriptive questions. For grounded theory, the questions need to address "process" questions, whereas in ethnomethodology and discourse analysis, the questions relate to verbal interaction and dialogue. She indicates that the wording of the research question determines the focus and scope of the study.

**Tuckman, B. W. (1999). *Conducting educational research* (5th ed.). Fort Worth, TX: Harcourt Brace College Publishers.**

Bruce Tuckman provides an entire chapter on constructing hypotheses. He identifies the origin of hypotheses in deductive theoretical positions and in inductive observations. He further defines and illustrates both alternative and null hypotheses and takes the reader through the hypothesis testing procedure.

CHAPTER SEVEN

# The Use of Theory

In *quantitative research*, the hypotheses and research questions are often based on theories that the researcher seeks to test. In *qualitative research*, the use of theory is much more varied. Thus, this book introduces the use of theory at this time in the design process because theory provides an explanation for the variables in questions and hypotheses in quantitative research. In contrast, in a quantitative dissertation, an entire section of a research proposal might be devoted to explicating the theory for the study. Alternatively, in a qualitative study, the inquirer may generate a theory during a study and place it at the end of a project, such as in grounded theory. In other qualitative studies, it comes at the beginning and provides a lens that shapes what is looked at and the questions asked, such as in ethnographies or in advocacy research. In *mixed methods research*, researchers may both test theories and generate them. Moreover, mixed methods research may contain a theoretical lens, such as a focus on feminist, racial, or class issues, that guides the entire study.

The chapter begins by focusing on theory-use in a quantitative study. It reviews a definition of a theory, the placement of it in a quantitative study, and the alternative forms it might assume in a written plan. Procedures in identifying a theory are next presented followed by a "script" of a "theoretical perspective" section of a quantitative research proposal. Then the discussion moves to use of theory in a qualitative study. Qualitative inquirers use different terms, such as theories, patterns, and naturalistic generalizations, to describe the understandings developed in their studies. Sometimes these understandings occur at the beginning of a study; at other times, they appear at the end. Examples illustrate the alternatives available to qualitative researchers. Finally, the chapter turns to the use of theories in mixed methods research and the use of theory in a type of strategy of inquiry—the transformative strategy—that emerged recently in the literature.