CHAPTER 2

# EXAMINING PRELIMINARY CONSIDERATIONS

Before designing and conducting a mixed methods study, consider several factors. Recognize the philosophical assumptions that provide a foundation for research. Some reviewers and graduate committee members may require researchers to be specific about the worldview that provides the foundation for their studies. All studies include assumptions about the world and knowledge that informs the inquiries. Also, have a good understanding of the basics of both quantitative and qualitative research. Recognize that they have common elements but differ in the implementation of these elements. Finally, determine whether mixed methods is a suitable design to use in addressing the research problem in a study. What types of problems are best suited for mixed methods research? This chapter will review the types of problems that require a mixed methods approach.

This chapter will address:

- The worldview or paradigm stances that relate to mixed methods research
- The elements of quantitative and qualitative research that provide a foundation for collecting and analyzing both forms of data in a mixed methods study
- The types of research problems best addressed by mixed methods research



## CONSIDER WORLDVIEW STANCES

We all bring to our research worldviews or paradigms that influence how we design and conduct our projects. *Worldview* and *paradigm* mean how we view the world and, thus, go about conducting research. They contain a basic set of beliefs or assumptions that guide our inquiries (Guba & Lincoln, 2005). They are a philosophy deeply rooted in our personal experiences, our culture, and our history. They may change during our lives and be shaped by new experiences and new thoughts.

### Different Worldviews or Paradigms

Why are these worldviews important? (We will use *worldview* primarily to discuss these assumptions, because many definitions exist for *paradigm*.) All research needs a foundation for its inquiry, and inquirers need to be aware of the implicit worldviews they bring to their studies. This awareness is especially important for graduate students who need to be able to identify and articulate the worldviews that they bring to research. An explicit statement of worldviews often does not find its way into journal publications, but it is a topic frequently raised at conference presentations and a topic in need of discussion when a new methodology is developed, such as mixed methods research.

Some researchers make their worldviews explicit by discussing them in their research; others recognize their presence but do not actively discuss them in their research. When asked about their philosophical assumptions by reviewers (e.g., committee members) or participants at a conference, these researchers can clearly articulate their beliefs. Still others are not familiar with the philosophical foundations of the different methods of conducting research and may not realize that behind each study lies assumptions the researcher makes about reality, how knowledge is obtained, and the methods of gaining knowledge. Especially for those in this last category, it will be helpful to review the different worldviews available. For those conducting mixed methods research, it is important to stop and reflect at this time on the worldviews available that may inform and provide legitimacy for mixed methods inquiry.

What worldviews exist? What are the common philosophical elements of all worldviews? The various worldviews continue to evolve, and there is no set standard for what they might be. Researchers tend to categorize the different types of worldviews and to describe characteristics that they all have in common (see, for example, Slife & Williams, 1995; Lincoln & Guba, 2000;

**Table 2.1** Four Worldviews Used in Research

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

SOURCE: Creswell (2003). Reprinted with permission of Sage Publications.

Creswell, 2003; Paul, 2005). Readers must not see these categories as rigid classifications but rather organizing frameworks to use in viewing different stances.

The most noted work on worldviews is available in qualitative research (Guba & Lincoln, 2005), but philosophical discussions are available for quantitative approaches as well (Phillips & Burbules, 2000). Most of these writings are by authors from the fields of social foundations of research or the philosophy of education (see Guba & Lincoln, 2005; Paul, 2005; Slife & Williams, 1995 for overviews of many different worldviews in research).

The four worldviews in Table 2.1 provide a good starting point. Postpositivism is often associated with quantitative approaches. Researchers make claims for knowledge based on (a) determinism or cause-and-effect thinking; (b) reductionism, by narrowing and focusing on select variables to interrelate; (c) detailed observations and measures of variables; and (d) the testing of theories that are continually refined (Slife & Williams, 1995). Constructivism, typically associated with qualitative approaches, works from a different worldview. The understanding or meaning of phenomena, formed through participants and their subjective views, make up this worldview. When participants provide their understandings, they speak from meanings shaped by social interaction with others and from their own personal histories. In this form of inquiry, research is shaped "from the bottom up": from individual perspectives to broad patterns and, ultimately, to theory.

Advocacy and participatory worldviews are influenced by political concerns, and this approach is more often associated with qualitative approaches than quantitative approaches. It does not necessarily have to



have this association, however. The need to improve our society and those in it characterizes these views. Issues such as empowerment, marginalization, hegemony, patriarchy, and other issues affecting marginalized groups need to be addressed, and researchers collaborate with individuals experiencing these injustices. In the end, the advocacy-participatory researcher plans for the social world to be changed for the better, so that individuals will feel less marginalized. A final worldview, pragmatism, is typically associated with mixed methods research. The focus is on the consequences of research, on the primary importance of the question asked rather than the methods, and multiple methods of data collection inform the problems under study. Thus it is pluralistic and oriented toward "what works" and practice.

All four worldviews have common elements but take different stances on these elements. They represent different views on the nature of reality (ontology), how we gain knowledge of what we know (epistemology), the role values play in research (axiology), the process of research (methodology), and the language of research (rhetoric) (Lincoln & Guba, 2000; Creswell, 2003). These different stances influence how researchers conduct and report their inquiries. Examples of these common elements, the different worldviews, and how the elements and worldviews are translated into practice are shown in Table 2.2.

As an example, consider the methodological differences. In postpositivist research, the investigator works from the "top" down, from a theory to hypotheses to data to add to or contradict the theory. In constructivist approaches, the inquirer works more from the "bottom" up, using the participants' views to build broader themes and generate a theory interconnecting the themes. In advocacy and participatory research, the methodology is collaborative, with the participants serving as active members of the research team, helping to form questions, analyze the data, and implement the results in practice. In pragmatism, the approach may combine deductive and inductive thinking, as the researcher mixes both qualitative and quantitative data.

In addition to examining the common elements that comprise the different worldviews, we need to see how these worldviews work in the process of research. A helpful conceptualization is available in Crotty (1998). As shown in Table 2.3, worldview assumptions known as epistemology are the broadest, most philosophical stances in the research process. These assumptions also exist at the next level of theoretical perspective, such as in symbolic interactionism, critical inquiry, and feminism. At this level, the researcher narrows the worldview to a particular theoretical lens. Moving to the next column in Table 2.3, we see methodology, which involves the various types of approaches to research that we have been calling *designs*, such as experiments, survey research, and grounded theory research. In this column, we

**Table 2.2** Common Elements of Worldviews and Implications for Practice

| *Worldview Element* | *Postpositivism* | *Constructivism* | *Advocacy and Participatory* | *Pragmatism* |
|---|---|---|---|---|
| Ontology (What is the nature of reality?) | Singular reality (e.g., researchers reject or fail to reject hypotheses) | Multiple realities (e.g., researchers provide quotes to illustrate different perspectives) | Political reality (e.g., findings are negotiated with participants) | Singular and multiple realities (e.g., researchers test hypotheses and provide multiple perspectives) |
| Epistemology (What is the relationship between the researcher and that being researched?) | Distance and impartiality (e.g., researchers objectively collect data on instruments) | Closeness (e.g., researchers visit participants at their sites to collect data) | Collaboration (e.g., researchers actively involve participants as collaborators) | Practicality (e.g., researchers collect data by "what works" to address research question) |
| Axiology (What is the role of values?) | Unbiased (e.g., researchers use checks to eliminate bias) | Biased (e.g., researchers actively talk about their biases and interpretations) | Biased and negotiated (e.g., researchers negotiate with participants about interpretations) | Multiple stances (e.g., researchers include both biased and unbiased perspectives) |
| Methodology (What is the process of research?) | Deductive (e.g., researchers test an a priori theory) | Inductive (e.g., researchers start with participants' views and build "up" to patterns, theories, and generalizations) | Participatory (e.g., researchers involve participants in all stages of the research and engage in cyclical reviews of results) | Combining (e.g., researchers collect both quantitative and qualitative data and mix them) |
| Rhetoric (What is the language of research?) | Formal style (e.g., researchers use agreed-on definitions of variables) | Informal style (e.g., researchers write in a literary, informal style) | Advocacy and change (e.g., researchers use language that will help bring about change and advocate for participants) | Formal or informal (e.g., researchers may employ both formal and informal styles of writing) |



**Table 2.3** The Four Elements Basic to Any Research Process

| *Epistemology* | *Theoretical Perspective* | *Methodology* | *Methods* |
|---|---|---|---|
| Objectivism | Positivism (and postpositivism) | Experimental research | Sampling |
| Constructivism | Interpretivism<br>• Symbolic interactionism<br>• Phenomenology<br>• Hermeneutics | Survey research | Measurement and scaling |
| Subjectivism (and its variants) | Critical inquiry | Ethnography | Questionnaires |
| | Feminism | Phenomenological research | Observation<br>• Participant<br>• Nonparticipant |
| | Postmodernism, etc. | Grounded theory | Interview |
| | | Heuristic inquiry | Focus group |
| | | Action research | Case study |
| | | Discourse analysis | Life history |
| | | Feminist standpoint research, etc. | Narrative |
| | | | Visual ethnographic methods |
| | | | Statistical analysis |
| | | | Data reduction |
| | | | Theme identification |
| | | | Comparative analysis |
| | | | Cognitive mapping |
| | | | Interpretative methods |
| | | | Document analysis |
| | | | Content analysis |
| | | | Conversation analysis, etc. |

SOURCE: Crotty (1998). Reprinted with permission of Sage Publications.

would update Crotty's list and add "mixed methods research." It is a methodology with epistemological and theoretical perspectives as well as methods. In the final column on the right, we see methods, the specific techniques of data collection and analysis (e.g., questionnaires, visual ethnographic methods). For mixed methods research, in which the investigator collects both qualitative and quantitative data, the methods involve multiple forms of data collection and analysis.

## Worldviews and Mixed Methods Research

How does a worldview provide a foundation for mixed methods research? Answers to this question have occupied the attention of mixed methods researchers for some time (Tashakkori & Teddlie, 1998, 2003a). In designing and conducting mixed methods research, researchers need to know the alternative stances on worldviews and mixed methods research and to be able to articulate the stances they are using. They might convey their stances in a separate section of a project, titled "philosophical assumptions," or in the methods section of their plan or study. Three stances are discussed in the mixed methods literature.

*Stance 1: There is one "best" paradigm or worldview that fits mixed methods research.* Although some individuals still seek to participate in the paradigm debate, many mixed methods writers have moved on to identify the "best" paradigm that provides a foundation for mixed methods research. Tashakkori and Teddlie (2003a) suggest that at least 13 different authors embrace pragmatism as the worldview or paradigm for mixed methods research. Although we have already introduced pragmatism, because of its importance, it merits further discussion.

Pragmatism is a set of ideas articulated by many people, from historical figures, such as Dewey, James, and Pierce, to contemporaries, such as Cherryholmes (1992), Murphy (1990), and Rorty (1990). It draws on many ideas, including employing "what works," using diverse approaches, and valuing both objective and subjective knowledge. Recently, Tashakkori and Teddlie (2003a) formally linked pragmatism and mixed methods research, arguing that

1. Both quantitative and qualitative research methods may be used in a single study.
2. The research question should be of primary importance—more important than either the method or the philosophical worldview that underlies the method.



3. The forced-choice dichotomy between postpositivism and constructivism should be abandoned.
4. The use of metaphysical concepts such as "truth" and "reality" should also be abandoned.
5. A practical and applied research philosophy should guide methodological choices.

It is worth pointing out, however, that Tashakkori and Teddlie (2003a) also mention one other possible "best" philosophical basis of mixed methods research, the transformative-emancipatory paradigm, another term for the advocacy-participatory approach. This paradigm focuses on the experiences of individuals who suffer from discrimination or oppression and involves engaging in research that addresses power differentials (Mertens, 2003). It necessitates the understanding of multiple contexts, building trust between researchers and research participants, and developing meaningful ways of addressing the concerns of diverse groups.

*Stance 2: Researchers can use multiple paradigms or worldviews in their mixed methods study.* This position states that multiple paradigms may be used in mixed methods research; researchers must simply be explicit in their use. This "dialectical" perspective (Greene & Caracelli, 1997, 2003) recognizes that different paradigms give rise to contradictory ideas and contested arguments—features of research that are to be honored but cannot be reconciled. These contradictions, tensions, and oppositions reflect different ways of knowing about and valuing the social world. This stance emphasizes using multiple paradigms (e.g., constructivism and advocacy) during the study instead of using one overall paradigm, such as pragmatism.

*Stance 3: Worldviews relate to the type of mixed methods design and may vary depending on the type of design.* Creswell et al. (2003) advocate for honoring different paradigm perspectives in application. They identify six different mixed methods designs and discuss how philosophical paradigms may differ, depending on the type of design used. This perspective maintains that investigators may view mixed methods research strictly as a "method" (as discussed in Chapter 1), thus allowing researchers to employ any number of philosophical foundations for its justification and use. The idea of relating different worldviews to different mixed methods designs will be revisited in Chapter 9.

In summary, as a general philosophical position for mixed methods research, then, pragmatism seems best to us, but as we will indicate later, our worldview informs the type of research design we employ. We recommend

that researchers consider the three stances on the question of worldviews, determine which stance(s) fits their worldview, and then present a written discussion in the mixed methods plan or study that reflects the stance(s) they have chosen.

## • THE BASICS OF QUANTITATIVE AND QUALITATIVE RESEARCH

Another preliminary consideration before designing and conducting mixed methods research is to review and know the basic elements of both quantitative and qualitative research (see Table 2.4), because both of these forms of research are used in mixed method studies. One learns about these approaches from taking coursework in quantitative and qualitative methods, by reading published studies, and by participating in actual research projects. Also, because diverse approaches to qualitative research exist, ranging from different philosophical assumptions to postmodern perspectives to various procedural approaches, the basics of qualitative research especially need to be reviewed. In this discussion, we will highlight the major elements of qualitative research as discussed by authors such as Morse and Richards (2002), Rossman and Rallis (1998), and Maxwell (1996).

A review of qualitative and quantitative research starts with the knowledge that they both address the same elements in the process of research. In Table 2.4, the center column indicates the major steps in the process of research. The qualitative and quantitative approaches then differ in how researchers implement each step. These differences are not opposites; rather, we see them as differences on a continuum. Thus, when viewing the headings of the columns on the left and right, one sees that the elements tend in the direction of one approach or the other. No single study perfectly fits all of the elements of either a qualitative or quantitative study. In good, scholarly studies that we would classify as either qualitative or quantitative, many of the elements can be easily seen.

As shown in Table 2.4, the two approaches tend to differ in the basic intent of the research—what the researcher hopes to accomplish during a study. This intent is typically expressed in the form of a purpose statement or the guiding objectives of the study. In qualitative research, the intent is to learn participants' views about a particular phenomenon. On the other hand, in quantitative research, the intent is to see how data provided by participants fits an existing theory (i.e., model, framework, or explanation). Thus the intent in quantitative research is either to support or to refute an existing theory.



**Table 2.4** Elements of Qualitative and Quantitative Research in the Process of Research

| *Elements of Qualitative Research Tend Toward . . .* | ***Process of Research*** | *Elements of Quantitative Research Tend Toward . . .* |
|---|---|---|
| • Understand meaning individuals give to a phenomenon inductively | **Intent of the research** | • Test a theory deductively to support or refute it |
| • Minor role<br>• Justifies problem | **How literature is used** | • Major role<br>• Justifies problem<br>• Identifies questions and hypotheses |
| • Ask open-ended questions<br>• Understand the complexity of a single idea (or phenomenon) | **How intent is focused** | • Ask closed-ended questions<br>• Test specific variables that form hypotheses or questions |
| • Words and images<br>• From a few participants at a few research sites<br>• Studying participants at their location | **How data are collected** | • Numbers<br>• From many participants at many research sites<br>• Sending or administering instruments to participants |
| • Text or image analysis<br>• Themes<br>• Larger patterns or generalizations | **How data are analyzed** | • Numerical statistical analysis<br>• Rejecting hypotheses or determining effect sizes |
| • Identifies personal stance<br>• Reports bias | **Role of the researcher** | • Remains in background<br>• Takes steps to remove bias |
| • Using validity procedures that rely on the participants, the researcher, or the reader | **How data are validated** | • Using validity procedures based on external standards, such as judges, past research, statistics |

A review of the literature is included in the research, and it may serve several purposes. In qualitative research, the researcher reviews the literature and uses it to provide evidence for the purpose of the study and the underlying problem addressed by the inquiry. The literature review is sometimes brief, and it does not guide the development of the research questions asked. In this way, the review of the literature in a qualitative study does not limit or constrain the types of information the researcher will learn from the participants in a study. In a quantitative study, the literature review establishes the importance of the purpose and the research problem in a study, and it has an additional goal. The literature may be used to identify a theory

to test or the specific questions that remain unanswered in the literature and that must be asked of the participants. Quantitative literature reviews, because of the multiple roles they assume, are often longer and more detailed than qualitative literature reviews.

The broad intent of a study and the literature help to narrow the research questions or hypotheses (see also Chapter 5 on this point). In qualitative research, because the intent is to learn from the participants, the questions are open-ended, allowing the participants to provide the information from their perspective. Participants' responses are likely to differ, so the understanding developed from these open-ended questions will lead to many diverse, complex answers. To obtain these perspectives, the qualitative researcher typically focuses on a single concept or phenomenon and learns about this phenomenon in depth. In quantitative research, the intent and literature point toward focused, closed-ended questions that relate variables to each other. The researcher seeks to find answers as a means of testing theories. Theories are composed of hypotheses or relational statements, and these statements are made up of variables. The researcher tests these hypotheses (or research questions) to support or refute the relationship statements in the theories.

Addressing the questions or hypotheses requires that the researcher collect data (see Chapter 6 for a more detailed discussion of the process). In qualitative research, the data tend to be words from participants (e.g., transcripts from interviews or field notes from observations). They may also be images, in the form of photographs or videotapes. To develop a deep understanding of the phenomenon, the researcher collects extensive data from only a few individuals, because more individuals participating in a study means that the researcher will obtain less depth from each participant. Further, that depth can be better established by actually going to the research site (e.g., home, place of work of the participants) to learn about the context of participants' thinking. In contrast, quantitative research tends to report only numbers or scores obtained from instruments, checklists, or information available in accessible documents (e.g., census reports). The idea is to test the theories broadly to see how they apply to many people at many sites. Thus instruments are sent to or collected from a large number of individuals, typically individuals representative of some larger population.

Analyzing the data follows data collection and relates to the forms of data collected (see Chapter 7 for a more detailed discussion of the steps). In qualitative research, the text or word data are analyzed using increasing levels of abstraction. From coding text segments, the researcher forms themes and may interrelate the themes to form broad generalizations. In quantitative research, the scores lead to numeric analysis through statistical procedures.



The overall intent is to reject or fail to reject the hypotheses to establish the theory. Researchers also may assess the differences in the impact of treatments in experiments through effect sizes.

The role of the researcher differs in qualitative and quantitative approaches. In qualitative research, the inquirers are "up front" and identify how their experiences and backgrounds shape the interpretations they make through the coding and theme development process. They report their own biases and position themselves in the research. In quantitative research, the investigator remains largely in the background. Specific steps are taken to reduce the bias in the study, such as enacting procedures to reduce the threats to internal validity that might render the results useless or presenting instruments to participants that contain words that are unbiased and not likely to lead to certain answers.

Establishing validity is an important step in the process of research, regardless of whether the research is qualitative or quantitative. However, the strategies used differ considerably. In qualitative research, the inquirer is interested in the accuracy of the final report or account. To this end, the themes may be taken back to participants (this is called member-checking), or the researcher may use multiple sources of information to provide evidence for a theme. The researcher spends considerable time in the field, thus contributing to the accuracy of an account, or employs a peer or external auditor to review all phases of the study. The focus in qualitative validity is reliance on the participants to review the findings, the resources of the researcher, or external reviewers.

In quantitative research, validity does not reside with the participants as much as with the accumulated evidence that supports the intended interpretation of test scores for a proposed purpose (*Standards for educational*, 1999). This evidence is based on test content, theoretical and empirical analyses of the response processes of test takers, an analysis of the internal structure of a test, the relation of test scores to variables external to the test, and the intended and unintended consequences of test use.

## RESEARCH PROBLEMS ADDRESSED BY MIXED METHODS ●

Beyond identifying a worldview stance and reviewing the basics of qualitative and quantitative research, an additional consideration prior to designing and conducting a mixed methods study is whether mixed methods, as compared to other designs, best addresses the research problem. What type of research problems are well suited for mixed methods research?

Before addressing mixed methods, let's begin by considering the types of problems addressed by quantitative and qualitative designs. Unfortunately,

**Table 2.5** Types of Research Problems and Matching Methods or Designs

| *Type of Research Problem* | *Types of Methods (Designs) Suited to Studying the Problem* |
|---|---|
| Need to see if a treatment is effective | Experimental design |
| Need to see what factors influence an outcome | Correlation design |
| Need to identify broad trends in a population | Survey design |
| Need to describe a culture-sharing group | Ethnography design |
| Need to generate a theory of a process | Grounded theory design |
| Need to tell the story of an individual | Narrative research |

although research method writers often proclaim that "the methods should match the problem," they seldom explain what they mean. Examine Table 2.5. As shown in this table, the relationship between research problems, in the left column, and the corresponding designs, in the right column, may make sense. If, for example, an investigator has a research problem (or questions) that requires examining whether a treatment is effective, he or she will use experimental procedures. If a need exists to describe the language or rituals of a culture-sharing group, an ethnography will be employed. Table 2.5 is not meant to be exhaustive but illustrative of some possible designs. What sorts of research problems would be the best match for mixed methods research?

Some answers are available in the mixed methods literature, but writers organize them under topics such as the "purpose" for mixed methods research (e.g., Greene, Caracelli, & Graham, 1989), or the "rationale" or "reasons" for using mixed methods research (see Creswell, 2003). Such discussions do not clearly convey the types of problems that best fit mixed methods research. Here are situations in which mixed methods is the preferred approach to addressing the research problem.

## A Need Exists for Both Quantitative and Qualitative Approaches

When only one approach to research (quantitative or qualitative) is inadequate by itself to address the research problem, mixed methods research is the preferred design. The combination of qualitative and quantitative data provides a more complete picture by noting trends and generalizations as well as in-depth knowledge of participants' perspectives. Situations in which this might occur are when a potential exists that one form of evidence (qualitative or quantitative) might contradict the other form of evidence (quantitative or qualitative). One type of evidence may not tell the complete story, or the researcher may lack confidence in the ability of one type of evidence to address the problem. Further, the type of evidence gathered from one level in an organization might differ from evidence looked at from other levels. These are all situations in which using only one approach to address the research problem would be deficient. A mixed methods design best fits this problem. For example, when Black and Ricardo (1994) studied drug use and trafficking and weapon carrying among low-income, African American adolescent boys, they collected both survey data and interview data. At the end of the introduction to their study, they provided the reasons for collecting both forms of data: "By using a combination of qualitative and quantitative data gathering techniques, investigators can clarify subtleties, cross-validate findings, and inform efforts to plan, implement, and evaluate intervention strategies" (p. 1066).



## A Need Exists to Enhance the Study With a Second Source of Data

When a quantitative design (e.g., experiment or correlational study) can be enhanced by qualitative data, or when a qualitative design (e.g., grounded theory or case study) can be enhanced by quantitative data, a mixed methods design is the preferred design. A problem might exist that results from an experimental or correlational design being insufficient in itself; in this situation, qualitative data enhances the overall study. Situations in which this occurs are the incorporation of embedded qualitative data in an experiment and the use of qualitative data to help explain the mechanisms actually at work in a correlational design. Although the use of quantitative data to enhance a qualitative study is less common, quantitative data might enhance a description of results or the identification of salient themes. Using an experiment as an example, Donovan et al. (2002) conducted an experimental trial comparing two groups of men with prostate cancer using different treatment procedures. They began their study, however, with a qualitative component in which they interviewed the men to determine how best to recruit them into the trial (e.g., how best to organize and present the information), because all the men had received abnormal results and sought the best treatment.

Toward the end of the article, the authors reflected on the value of this preliminary, smaller, qualitative component used to recruit individuals to the trial:

> We showed that the integration of qualitative research methods allowed us to understand the recruitment process and elucidate the changes necessary to the content and delivery of information to maximize recruitment and ensure effective and efficient conduct of the trial. (p. 768)

### A Need Exists to Explain the Quantitative Results

A problem exists when the quantitative results are inadequate to provide explanations of outcomes, and the problem can best be understood by using qualitative data to enrich and explain the quantitative results in the words of participants. Situations in which this problem occurs are those in which the quantitative results need further interpretation as to what they mean or when more detailed views of select participants can help to explain the quantitative results. A mixed methods design is thus the preferred design. Wampold et al. (1995) conducted a two-phase study of social communication and interaction skills. The first phase was of undergraduates in college classes, who completed two quantitative instruments. The second, qualitative phase sought to understand social interactions in an actual work context, and this second phase involved chemistry work groups. The authors reported,

> First, because the nature and tasks of work groups differ significantly across work settings, differences in the nature and tasks of the groups would be confounded with differences in the social skill levels of the group members, precluding traditional group comparisons. Second, we wanted to describe the social interactions in their natural setting. (p. 371)

### A Need Exists to First Explore Qualitatively

A problem exists when qualitative research can provide an adequate exploration of a problem, but such an exploration is not enough—quantitative research is needed to further understand the problem. The situations in which this occurs are when qualitative research can explore initially to best identify variables, constructs, taxonomies, and theories to test, as well as aid in the identification of items and scales to help develop a quantitative instrument. Mixed methods research provides a good method for these types of problems. For example, Kutner, Steiner, Corbett, Jahnigen, and Barton (1999) studied issues important to terminally ill patients. Their study began with qualitative interviews, and these were then used to develop an instrument that was administered to a second sample of terminally ill patients. The authors said: "The use of initial open-ended interviews to explore the important issues allowed us to formulate relevant questions and discover what were truly concerns to this population" (p. 1350).



In these examples, the authors provided only one reason for their use of mixed methods research. Multiple reasons might actually exist, and we recommend that investigators first ask themselves what all the reasons are for using mixed methods research and then specifically state these reasons clearly in their study.

## Summary

Before designing and conducting a mixed methods study, three preliminary considerations need attention. Researchers need to consider what worldview or philosophical assumptions underlie their mixed methods study. Three stances are (a) that there is a "best" worldview to use with mixed methods research, (b) that researchers can employ multiple worldviews and honor each, and (c) that the worldview and the type of mixed methods design are closely related. Next, the researcher should review the basics of quantitative and qualitative research, as both will be included in the mixed methods study and because many approaches exist to qualitative research. Quantitative and qualitative research approaches tend to differ in the major steps they use in the process of research, such as the intent of the study, the review of the literature, the use of questions or hypotheses, the data collection, the data analysis, the role of the researchers, and the validation of the data. Finally, consider whether the research problem requires a mixed methods approach. Addressing the research problem may require both quantitative and qualitative approaches, may require adding a secondary form of data to a design, may require explaining quantitative results with qualitative data, or may require initially exploring qualitatively before developing a quantitative study.

## Activities

1. Identify your worldview or paradigm stance for your mixed methods study. Why did you take this position?
2. Find one quantitative and one qualitative research article. Go through each article and list the major elements of both approaches, using Table 2.4 as your guide.

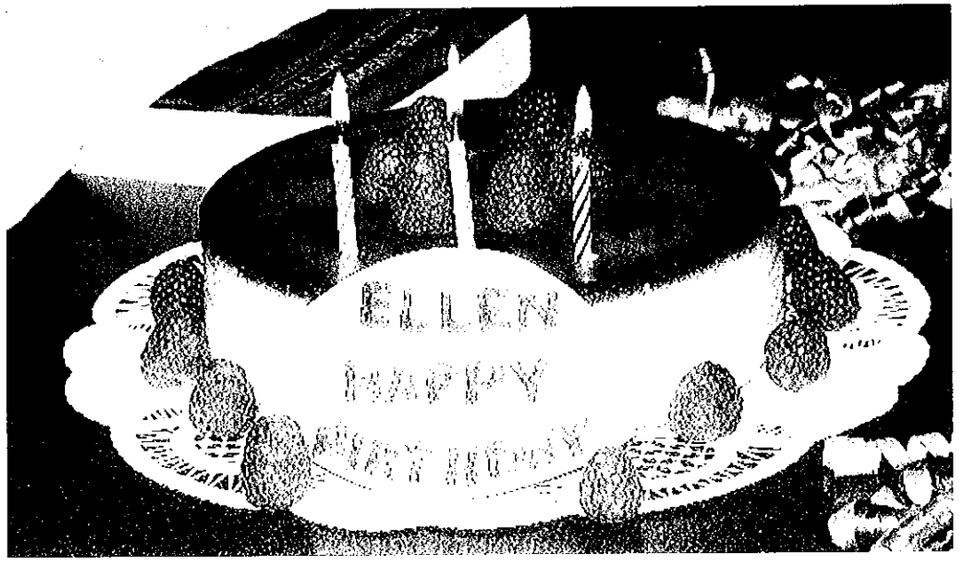

**Figure 2.1** The Birthday Cake

Photo Credit: Diandra Leslie-Pelecky (2005). Used by permission.

3. State the reasons why you are using mixed methods research to address your research problem. Why would one form of data not provide enough information to address your research problem or questions?

4. Reflect on the picture of the birthday cake shown in Figure 2.1. What do you see going on in this cake? Write a paragraph about the cake, using the major elements of both qualitative and quantitative research. Then write a paragraph identifying what is gained by bringing the qualitative and quantitative perspectives together into one perspective.

## Additional Resources to Examine

Good discussions about purposes of mixed methods research can be found in

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*(3), 255–274.



For a review of the basics of qualitative and quantitative research, see

Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (2nd ed.). Upper Saddle River, NJ: Pearson Education.

For discussions about the philosophical foundations of research, see

Denzin, N., & Lincoln, Y. S. (2005). *Handbook of qualitative research* (3rd ed.) Thousand Oaks, CA: Sage.

Paul, J. L. (2005). *Introduction to the philosophies of research and criticism in education and the social sciences*. Upper Saddle River, NJ: Pearson Education.

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

For an overview of pragmatism, see

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