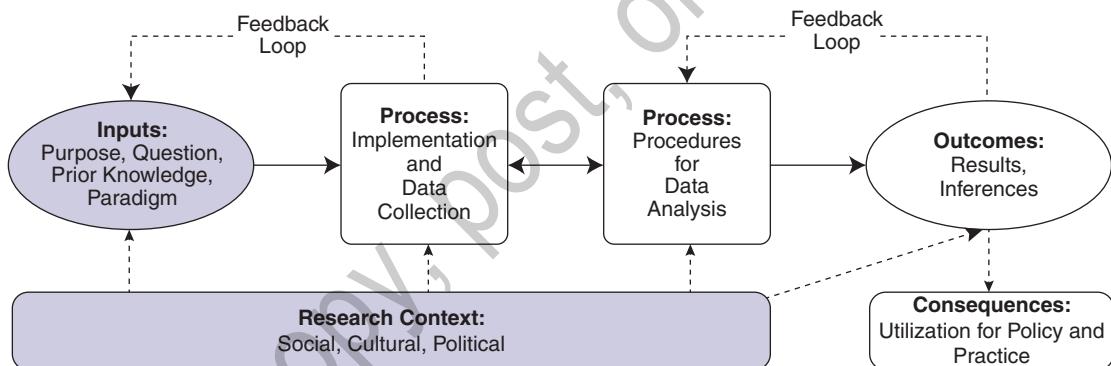# 2

THREE APPROACHES TO RESEARCH

FIGURE 2.0

OBJECTIVES

Upon finishing this chapter, you should be able to:

- Explain the multidimensional nature of research studies and why/how different components of any study may be placed on different positions on the continua

- Find an interesting mixed methods research article (beyond the one presented in Appendix A) and identify its important quantitative, qualitative, and mixed methods components

- Compare and contrast various definitions and conceptualizations of mixed methods

- Describe various ways mixed methods enhances the quality of inputs, processes, or outcomes of studies

In this chapter, we provide additional details about the methodological similarities and differences among the three research communities. We also provide an extended description and analysis of an MM study, discuss issues related to MM definitions, and explain the use of MM research. The QUAL-MM-QUAN multidimensional continuum is introduced as an alternative way of perceiving the interrelationships among the three methodological communities. We and other colleagues (e.g., Johnson & Onwuegbuzie, 2004; Newman & Benz, 1998; Niglas, 2004) believe that the QUAN and QUAL approaches are not dichotomous and distinct. They have been presented as dichotomies in this text thus far for pedagogical reasons (i.e., to help the reader understand the differences among the research orientations in their pure form). However, we think it is more accurate to consider each component of a research study as a collection of points within a multidimensional continuum. We present this continuum and some of its characteristics.

Two issues related to MM terms and definitions are briefly discussed: (a) the need for a distinct MM language and (b) the choice of using a "bilingual" or a common language in MM research. The chapter ends with a discussion of the major advantages of MM in answering research questions.

METHODOLOGICAL DISTINCTIONS AMONG THE THREE COMMUNITIES: CONTINUA, NOT DICHOTOMY

Thus far, we have described the methodological communities in terms of three separate or distinct sets of characteristics, although we have always cautioned against that arbitrary division. Newman, Ridenour, Newman, and DeMarco (2003) discussed a model similar to the QUAL-MM-QUAN continuum that we introduce here. They called their model the *qualitative-quantitative interactive continuum*:

> Qualitative and quantitative research makes up a false dichotomy. . . . Debating their comparative worth is pointless because multiple research perspectives enable social science researchers to approach questions of interest within a wide variety of ways of knowing. There are many right ways to approach research, not only one right way. One's purpose provides a way to determine the optimal path to studying the research question. Along the continuum are entry points through which a researcher can locate himself or herself and the study. (Newman et al., 2003, pp. 169–170)

Figure 2.1 presents an illustration of a continuum of **integration**, with the "pure" QUAN orientation at one end, the "pure" QUAL orientation at the other, and degrees or shades of integration between the two. One can transform either a purely QUAL- or a QUAN-oriented study by moving inward in the space between the two extremes from either side. Importantly, MM studies can occur at any point on the continuum, from the far left to the far right. In fact, any study (identified as mixed or not) may be placed on a "slice" of the rectangle in Figure 2.1, with a degree of integration of the two main approaches. Although Figure 2.1 aims to demonstrate an overall orientation or approach, the reader should

FIGURE 2.1 ⬡ Mixed Methods as a Continuum of QUAL and QUAN Integration

Q U A N				QUAL and QUAN				Q U A L
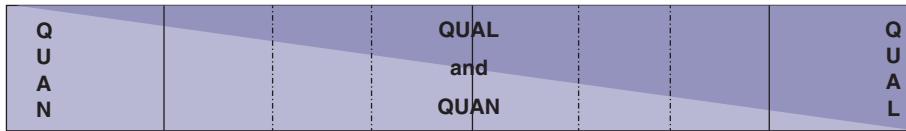
not view the continuum as reducing research to only one dimension. As we discuss in Chapter 1 and in the sections below, research projects (more so the MM) may be differentiated on many dimensions (see Table 2.1).

In Chapter 3, we present "paradigm contrast tables" that serve a valuable function from a didactic point of view (see Tables 3.1 and 3.2 on pages 61 and 63). These tables can be used to introduce students to paradigmatic and methodological differences among certain groups of researchers (e.g., methodological purists) who are still actively working in the human sciences. Reichardt and Cook (1979) noted the same benefit:

> Undoubtedly, there is some pedagogical advantage to the dialectic form of argument that polarizes qualitative and quantitative methods. For example, it is often easiest to state a case by dichotomizing a continuum into polar extremes *so that the dimension of interest is more clearly revealed.* (p. 27, italics added)

In the real world of research, however, continua of philosophical orientations, rather than dichotomous distinctions, more accurately represent the positions of most investigators (also see Johnson & Gray, 2010; and Niglas, 2010).

We believe that every aspect of a research project (e.g., paradigmatic orientation, purpose, questions, data, data analysis strategies, inference, utilization) may be placed along a multidimensional continuum, as illustrated in Table 2.1. For example, researchers' opinions about the role of values in their work range from those who believe that inquiry is value free to those who believe that inquiry is fully value bound, with numerous intermediary positions. Once again, it should be clear that a totally value-free research study is not possible because the researchers' value system impacts the questions, methods, and inferences of any study in one form or another. Similarly, a totally value-based study has no regard for how most researchers and consumers of research would interpret the results. Also, a totally personal value-bound study is not feasible because every study needs to have *some* degree of "objectivity" and understanding of "the other" viewpoint.

Most (but not necessarily all) components of a QUAN project are somewhere near the left end of multiple continua in Table 2.1, whereas most (but not necessarily all) components of a QUAL project are close to the right end of these dimensions. Despite this general tendency, it is possible to have QUAN projects that are exploratory, collect data via unstructured and open-ended procedures, and develop transformative inferences or explanations. Alternatively, it is possible to have QUAL projects that are explanatory or confirmatory, use probability sampling procedures, or include a structured design (such as field experiments). Following this logic, all research projects may be considered mixed, at least to some degree. This is also supported by the difficulty (or impossibility) of placing *all* components of a research project on one absolute end of the continuum (e.g., it is hard to think of absolutely deductive or inductive questions or completely value-free investigations).
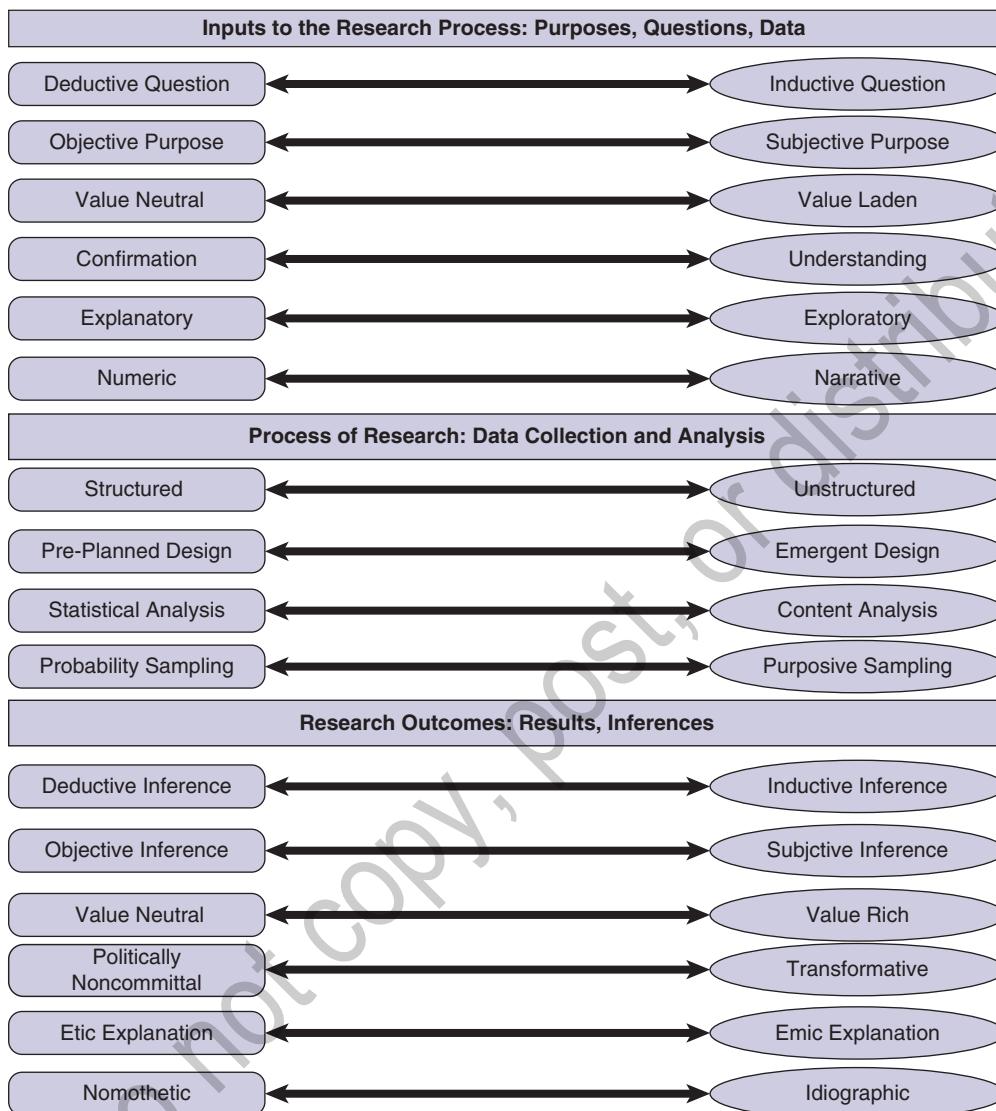
TABLE 2.1 ⬡ Multidimensional Continuum of Research Projects

Inputs to the Research Process: Purposes, Questions, Data		
Deductive Question	⟵⟶	Inductive Question
Objective Purpose	⟵⟶	Subjective Purpose
Value Neutral	⟵⟶	Value Laden
Confirmation	⟵⟶	Understanding
Explanatory	⟵⟶	Exploratory
Numeric	⟵⟶	Narrative

Process of Research: Data Collection and Analysis		
Structured	⟵⟶	Unstructured
Pre-Planned Design	⟵⟶	Emergent Design
Statistical Analysis	⟵⟶	Content Analysis
Probability Sampling	⟵⟶	Purposive Sampling

Research Outcomes: Results, Inferences		
Deductive Inference	⟵⟶	Inductive Inference
Objective Inference	⟵⟶	Subjctive Inference
Value Neutral	⟵⟶	Value Rich
Politically Noncommittal	⟵⟶	Transformative
Etic Explanation	⟵⟶	Emic Explanation
Nomothetic	⟵⟶	Idiographic

Table 2.1 presents an elaboration of the continuum in Figure 2.1 in the form of a multidimensional representation of research projects:

- QUAN projects (e.g., those conducted by Professors Experimentalista and Numerico from Chapter 1) somewhere on the left side of Figure 2.1 or close to the left side of most or all dimensions of Table 2.1

- Mixed methods projects that use both QUAN and QUAL approaches (e.g., those conducted by Professor Eclectica) or have components that spread across the continuum in Table 2.1

- QUAL projects (e.g., those conducted by Professor Holistico) close to the right side of Figure 2.1, or on the right side on most or all dimensions of Table 2.1

Table 2.2 expands on this continuum by elaborating on the *QUAL-MM-QUAN* methodological continuum that may be placed on each dimension from the "purely" QUAL to the "purely" QUAN orientation. These continua serve as an advance organizer for methodological issues to be discussed throughout the rest of the text, such as research questions/hypotheses, research designs, sampling, data collection strategies, data analysis, and making conclusions (Chapters 4–10).

TABLE 2.2 ⬡ The QUAL-MM-QUAN Methodological Continuum			
General Issue (Chapter in Text)	**QUAL Position**	**Mixed (MM) Position**	**QUAN Position**
Statements of research purpose (Chapter 4)	Most (but not all) QUAL research is exploratory in nature; most QUAL research involves the statement of research questions.	MM may involve the statement of both research questions and hypotheses (both exploratory and confirmatory).	Most (but not all) QUAN research is confirmatory in nature; QUAN research may involve the statement of research hypotheses or research questions or both.
Design traditions (Chapter 5)	Design traditions include ethnography, grounded theory, phenomenological research, biography, and case study.	All design traditions are included in these studies, including unique MM designs.	Research may be comparative, correlational, quasi-experimental, or experimental.
Sampling (Chapter 6)	Purposive sampling is emphasized in QUAL research; QUAL research may also involve probability sampling.	MM sampling includes both purposive and probability sampling.	Probability sampling is emphasized in QUAN research, although purposive sampling may also be involved.
Data collection strategies (Chapters 7 and 8)	QUAL may include all types but typically involves unstructured observations, open-ended interviews, focus groups, and unobtrusive measures.	All data collection strategies are included.	QUAN may include all types but typically involves structured observations, closed-ended interviews, questionnaires, and tests.
Data analysis (Chapter 9)	QUAL includes qualitative (thematic) data analysis (categorical strategies, contextualizing strategies).	MM data analyses, both thematic and statistical analyses plus data conversion techniques, are used.	Statistical analysis (descriptive, inferential) is used.
Validity or inference quality issues (Chapter 10)	Trustworthiness, credibility, transferability, dependability, and various authenticity criteria are emphasized.	All inference and validity issues are subsumed under inference quality and inference transferability.	Statistical conclusion validity, internal validity, construct validity, and external validity are emphasized.

ISSUES RELATED TO MIXED METHODS TERMS AND DEFINITIONS

The Need for a Distinct Mixed Methods Language

An interesting distinction exists between the QUAN and QUAL traditions regarding the issue of common terms and definitions. Traditional QUAN definitions of basic constructs and designs have long been established in classic texts (e.g., Campbell & Stanley, 1963; Cook & Campbell, 1979; Shadish et al., 2002) and in the annals of statistics and measurement journals. Although there is slow evolution in the QUAN methodological research field, no one expects large changes in the basic paradigm of postpositivism or the constructs and research designs associated with this worldview.

Common definitions of QUAL constructs and designs, on the other hand, are more emergent and less systematic and have been slow to develop, with the occasional exception, such as Schwandt's (2007) excellent *Qualitative Inquiry: A Dictionary of Terms*, which we refer to throughout this text. Many of the leading figures in QUAL research believe, however, that such systematic codification of terms is neither possible nor desirable.

A reasonable question for mixed methodologists at this point in time is, "Do we want a common nomenclature, with an established set of terms and definitions?" We believe that most mixed methodologists would answer with a resounding "yes" because the lack of an overall system of terms and definitions has created confusion and imprecision in past MM writing and research.

Several authors have consistently defined some terms uniquely associated with MM, such as *data conversion*, with its two subprocesses *quantitizing* and *qualitizing*. These terms have been defined specifically enough to be applied consistently across a number of sources (e.g., Bazeley, 2018; Creamer, 2018; Johnson & Turner, 2003). For instance, Sandelowski (2003) described her use of quantitizing techniques in a study in which she transformed narrative interview data into numeric data that were then analyzed using Fisher's exact probability test. In her qualitizing example, she discussed taking quantitatively derived clusters of numeric data and transforming those into distinct qualitatively described "profiles" using grounded theory.

Other terms with widely accepted meanings include the basic MM designs, such as *sequential mixed methods designs*, *parallel mixed methods designs*, and *conversion mixed methods designs*. These designs and their characteristics are discussed in detail in Chapter 5.

On the other hand, as MM research has evolved, certain terms have been defined in an inconsistent manner. Past literature shows that the terms *multimethod design* and *mixed methods design* have been confused with one another. There seems to be a particular issue with the term *multimethod design*, which has been defined quite differently by different authors:

- The use of two QUAN methods (Campbell & Fiske [1959] employed the term *multitrait-multimethod matrix* to connote the use of more than one QUAN method to measure a personality trait).

- The use of QUAL and QUAN methods as two distinctly separate parts of one research program (Morse, 2003) that "does not necessarily require the mixing or integration" of the results (Hesse-Biber, 2015, p. xxxix).

- The use of both QUAN and QUAL methods or the use of two different types of either QUAL or QUAN methods (QUAL/QUAL or QUAN/QUAN) as described by Hunter and Brewer (2003).

Throughout this text, we use of the term *mixed methods* and the research designs associated with it to represent some form and degree of QUAL and QUAN integration. We differentiate between them and **quasi-mixed methods designs** (studies that include QUAL and QUAN data or methods, but do not integrate the results) or **multimethod designs** (studies that use two QUAL or two QUAN approaches/methods).

Johnson, Onwuegbuzie, and Turner (2007) addressed the issue of the definition of MM research. They presented 19 different definitions of MM research from experts in the field, noting that there were both similarities and differences among them. Five common themes emerged from an analysis of the definitions, including *what* is mixed (QUAN and QUAL research), *when* the mixing is carried out, the *breadth of the mixing*, and *why* the mixing is carried out.

Based on this analysis, Johnson et al. (2007) presented the following rather broad definition of MM research:

> Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purpose of breadth of understanding or corroboration. (p. 123)

The Choice of "Bilingual" or Common Terminology for MM Research

The major decisions that mixed methodologists have to make concerning terms and definitions are whether to

- Use a bilingual nomenclature that employs both the QUAL and the QUAN terms for important methodological issues, such as validity or sampling

- Create a new language for mixed methodology that gives a common name for the existing sets of QUAL and QUAN terms

- Combine the first two options by presenting new MM terms that are integrated with well-known QUAL/QUAN terms

We believe that it is essential for social and behavioral scientists today to be methodologically bilingual: Scholars should have at least a minimum degree of fluency in both the QUAL and QUAN languages and be able to translate back and forth between the two. It is especially important that researchers be able to recognize, in both languages, terms that describe the same basic concepts, such as *external validity* and *transferability*.

We also believe that mixed methodologists should develop a new nomenclature that transcends the separate QUAL and QUAN terminologies under certain circumstances. Three conditions should be met before mixed methodologists develop new terms:

- The described QUAN and QUAL processes should be highly similar.

- The existing QUAL and QUAN terms must be overly used or misused.

- Appropriate alternative terminology must exist.

For instance, the term *validity* has more than 135 different meanings within the QUAL and QUAN traditions. When a term has so many different meanings, it becomes meaningless. This is a case where mixed methodologists can develop their own terminology to replace the confusion of the multiply defined QUAL and QUAN terms because the logic of evaluation across the two orientations is very similar and there appears to be an appropriate alternative terminology. Chapter 10 presents an extended demonstration of how the terms *inference quality* and *transferability* can be used to encompass the currently used QUAN and QUAL terms.

Another example from MM involves the overuse of the term *triangulation* in several disciplines, such as nursing. Sandelowski (2003) addressed this issue as follows:

> When any kind of research combination is designated as triangulation, there is no inquiry that is not triangulated. Having too much meaning, the word *triangulation* has no meaning at all. . . . Triangulation appears as a "near-talismanic method" (Miles & Huberman, 1994, p. 266) for democratizing inquiry and resolving conflicts between qualitative and quantitative inquiry. (p. 328, italics in original)

Triangulation is a veritable "magical" word in many disciplines using MM research, having been developed through a series of insightful works (e.g., Campbell & Fiske, 1959; Denzin, 1978; Jick, 1979; Patton, 2002). Triangulation is a word that most researchers, regardless of their own methodological orientation, associate with MM. We would not want to discard a word with "near-talismanic" meaning, so what do we do when it appears to be overused to the point where it means nothing? Can the term be rehabilitated, or does it carry too much baggage?

In Chapter 1, we defined triangulation as *the combinations and comparisons of multiple data sources, data collection and analysis procedures, research methods, and inferences that occur at the end of a study*. This definition was made quite broad to cover the most important aspects of research that have been associated with triangulation (both as a process and as an outcome). Data sources, data collection methods, and research methods have all been tied to triangulation techniques in seminal articles and chapters on the topic (e.g., Denzin, 1978; Patton, 2002). In 2007, Creswell and Plano Clark used triangulation for a design name, the "triangulation design," but they dropped that design from the last two recent editions of their book on mixed methods research (2010, 2018) and replaced it with convergent designs. We put these designs under the general family of "parallel mixed methods." Although we have broadened the definition of triangulation to make it more consistent with the literature, it is unclear whether the term is still useful. One of the issues with

the use of the term triangulation *design* is that the word triangulation suggests convergence and confirmation (this also applies to "convergent designs"). In practice, triangulation as a process might lead to highly valuable divergent findings that lead to new explanations of phenomena when integrated (for more details, see Erzberger & Kelle, 2003)!

THE UTILITY OF MIXED METHODS RESEARCH

The utility of MM concerns *why* we employ them in our research projects. With the plethora of research methods associated with the QUAL and QUAN traditions, why would we bother combining them, or generating new techniques, to conduct MM research? Bergman (2018) provides an answer to this question:

> Mixed methods research and designs are well suited for dealing with complexity, mutability, and transdisciplinary. Designed for different entry points and flexible enough to take on board various stakeholder positions, mixed methods research could be successfully used to develop new ways of thinking about and studying known phenomena or capturing new phenomena, replacing or improving on outdated or unsuitable ways of studying phenomena, or confirming the relevance of known phenomena in a new context. Exploration, complementarity, and convergence—classical justifications for a mixed methods research design—seem highly pertinent to the study of migration. (p. 373)

The ultimate goal of any research project is to answer the questions set forth in the beginning of the study (or modified during the process). Perhaps Padgett (2012) provides an answer to the question of why MM might be needed for answering research questions:

> On balance, both quantitative and qualitative methods have something to offer. Surveys supply much-needed aggregate information on individuals, households, neighborhoods, organizations, and the entire nation. Yet, they fall short in assessing individuals as they live and work *within* their households, organizations, and nations. (p. 9, italics in original)

There appear to be three areas where MM research is superior to the single-approach designs:

- MM research can simultaneously address a range of exploratory (*what*), explanatory (*how*, *why*), and confirmatory (*what-if*) questions through the integration of qualitative and quantitative approaches. We will discuss different type of questions in Chapter 4.

- MM research provides better (stronger) inferences by integrating the outcomes of multiple strands of a study. We will discuss "meta-inferences" in Chapter 10.

- MM research provides the opportunity for a greater assortment of divergent perspectives about the issue under investigation.

Table 2.3 presents some examples to demonstrate how the use of MM might enhance the quality of inputs, processes, or outcomes of your research project.

TABLE 2.3 ⬢ Examples of How Using a Mixed Methods Approach Might Enhance Your Research Project

Enhance Your Inputs

- Ask multiple types of questions (exploratory, confirmatory).
- Collect multiple types of data; triangulate for validity/trustworthiness purposes.
- Convert one type of data to another to perform two types of analysis.
- Collect data from multiple sources to capture multiple perspectives.
- Collect data with multiple methods to enhance data quality.

Enhance Your Design/Process

- Find out why/how a treatment works in an experiment via post-experimental case studies.
- Conduct focus groups to find out why/how survey instruments are perceived/responded to.
- Add a qualitative strand to explore the equality of groups in a quasi-experimental study.
- Add a survey to your qualitative study in order to get broader coverage.
- Do factor analysis to confirm your obtained themes in a QUAL study, or vice versa. Compare and contrast the two.
- Mix large national data sets with local qualitative in-depth study to improve understanding.
- Mix secondary quantitative data and first-hand qualitative data to explain/expand.
- Use delegated recording techniques (e.g., Rochester Interaction Record) to obtain quantitative ratings of feelings or other aspects. Follow up with a small group to understand why, how, and so forth.
- Create groups based on QUAL or QUAN results; compare these groups on QUAN or QUAL results.

Enhance the Quality of Your Outcomes

- Incorporate the results of a qualitative strand to explain the outcomes of an experiment.
- Confirm/disconfirm your interpretation of survey results via detailed interviews of a small subsample.
- Select typical cases in a survey/other quantitative study to follow up. Know in more detail how the treatment worked or why specific responses were obtained (e.g., for a cluster analysis based on surveys, select typical cases; for a regression analysis, select based on regression residuals for those who fit and do not fit the model).
- Do an experiment to test hypotheses generated from a QUAL study (sometimes unexpected results, sometimes just new results).
- Conduct a QUAL study to test a failed hypothesis in a previous strand to see how detailed data confirms/disconfirms and/or why.
- Use constant comparative analysis to see what themes you may find in addition to the factors you have found in an exploratory factor analysis, and also to develop detailed supporting/expanding data about factors (i.e., narrative examples to represent each factor for dissemination).
- Perform an in-depth case study following a single-subject experiment to provide strong background support and to identify conditions in which the treatment works or does not work as effectively.
- Pair GPS readings (places visited, distances walked) with detailed qualitative interviews to understand why these behaviors occurred.
- Mix big data identifiers (colleges searched for, hotels stayed at, products ordered) with detailed follow-up to understand reasons and mechanisms/processes of decision-making.

Addressing Exploratory, Explanatory, and Confirmatory Questions Simultaneously

One of the dimensions on which QUAN and QUAL research is said to vary is the type of question answered by each approach. Some authors have suggested that QUAL research questions are exploratory (i.e., they are concerned with generating information about unknown aspects of a phenomenon), whereas QUAN research questions are confirmatory (i.e., they are aimed at testing theoretical propositions).

Others disagree with this dichotomization of research questions (e.g., Erzberger & Prein, 1997; Tashakkori & Teddlie, 1998, 2003a). For example, Punch (2005) provided this argument against the dichotomization:

> Quantitative research has typically been more directed at theory verification, while qualitative research has typically been more concerned with theory generation. While that correlation is historically valid, it is by no means perfect, and there is no necessary connection between purpose and approach. That is, quantitative research can be used for theory generation (as well as verification) and qualitative research can be used for theory verification (as well as generation). (p. 16)

We agree with this statement regarding the generation and verification (today called *confirmation*) of theory. What happens when you want to do both in the same study? *A major advantage of mixed methods research is that it enables the researcher to simultaneously ask exploratory, explanatory, and confirmatory questions and therefore generate, explain, and verify theory in the same study.*

An example of this two-faceted questioning procedure is an educational research dissertation by Stevens (2001). In this study, Stevens wanted to examine and describe the changes in a set of middle schools that resulted from the introduction of an external change agent (Distinguished Educator) associated with a statewide school accountability program. It was hypothesized that teachers in schools with a Distinguished Educator would perform better on measures of teacher effectiveness than teachers in schools without a Distinguished Educator.

A QUAN quasi-experimental design confirmed this hypothesis: Teachers in schools with a Distinguished Educator had significantly higher rates of effective teaching than teachers in schools without a Distinguished Educator. Although this result was important, Stevens (2002) also wanted to know how this result occurred. Simultaneously with gathering the QUAN data, she conducted case studies in each of the schools using QUAL techniques such as observations, interviews, and document analysis. Results from the QUAL analyses indicated that the Distinguished Educators were perceived as having a positive influence on (1) teacher collaboration and sharing, (2) the expectations of both teachers and students for student learning, and (3) the quality of instruction. These Distinguished Educator activities were directly or indirectly related to the higher rates of effective teaching.

This MM study could not have been conducted exclusively within either the QUAN or the QUAL traditions. The mixed methods design allowed the doctoral student to simultaneously test a quantitatively derived hypothesis and explore in greater depth the processes whereby the relationship occurred.

The GAIN evaluation (Riccio, 1997; Riccio & Orenstein, 1996) is another example of an MM research study that answered confirmatory and exploratory questions simultaneously.

GAIN, a welfare-to-work program created by the California legislature, provided welfare recipients with job search assistance, basic education, vocational training, and so on. GAIN's goals were to increase employment and reduce reliance on welfare. Three of the goals of the evaluation (Rallis & Rossman, 2003) can be stated as either research hypotheses or questions:

1. What are GAIN's effects on employment and on the number of individuals on welfare? This can be restated as the following hypothesis: Individuals in the GAIN program will have higher employment rates and will be less likely to remain on welfare than individuals not in the GAIN program.

2. What can we learn about the California counties' experiences in implementing GAIN and the recipients' participation and experiences?

3. How did different program strategies influence the results?

The first evaluation question is confirmatory in nature: The evaluators (or at least their funding agency) expected GAIN to have a positive effect on employment and welfare-roll figures. This question was restated in the preceding list as a research hypothesis that was tested by statistical analysis of QUAN data generated by a large-scale experimental study, in which welfare recipients were randomly assigned to GAIN or a control group.

The second and third questions were exploratory in nature and aimed to describe the counties' experiences in implementing GAIN and the recipients' experiences and to explain how various strategies influenced the results. A variety of data sources were used to answer these questions: field research, case files data, surveys of both staff and program recipients, and so on. These exploratory and explanatory questions were vital to the evaluation because without them the evaluators would not know how the program's effect occurred.

Providing Stronger Inferences

Several authors have postulated that using MM can offset the disadvantages that certain methods have by themselves (e.g., Brewer & Hunter, 1989; Creswell, Plano Clark, Gutmann, & Hanson, 2003; Greene & Caracelli, 1997b). For example, Johnson and Turner (2003) referred to the *fundamental principle of mixed methods research:* "Methods should be mixed in a way that has complementary strengths and nonoverlapping weaknesses" (p. 299). Two of the functions of MM research described by Greene et al. (1989) concerned the strengthening of inferences: triangulation and complementarity.

A classic MM combination involves using in-depth interviews in conjunction with mailed questionnaires. One type of data gives greater depth, whereas the other gives greater breadth; together it is hoped that they yield results from which one can make better (more accurate) inferences.

Erzberger and Kelle (2003) presented a good example of a study (Krüger, 2001) whose inferences were stronger because they resulted from both QUAN and QUAL data. This occupational life study, conducted in Germany, had two major data sources:

1. Standardized questionnaire data on the occupational life courses of a sample of men (birth cohort of 1930), including starting and end points of employment, starting and end points of periods of unemployment, illnesses, and so on

2. Open-ended interviews where the men discussed their interpretations and perceptions of their occupational and domestic lives

The researchers expected great stability in the occupational life courses of the cohort because the men had worked during (West) Germany's postwar period (i.e., the 1950s and 1960s). This "era of the economic miracle" was characterized by traditional orientations and norms, including gender-role patterns with regard to the tasks, obligations, and rights of men and women.

The QUAN results indicated that the great majority of the men in the cohort had been fully employed almost all of their lives, except for short periods of joblessness or sickness. There were few interruptions in their highly stable careers.

The QUAL results agreed with and extended the results from the analysis of the QUAN data. The in-depth interviews included questions about the men's interpretations of their work biographies, their perceptions of their role as a breadwinner, and their participation in household and family work. Paid labor had a high importance for the men in the study, who perceived it as their fair share of the total work effort for the family. They considered bread-winning as their central moral obligation and as fulfillment of their family work duties.

The consistency between the experiences of the respondents related to their occupational life course (quantitatively described through the standardized questionnaires) and their subjective interpretations of these experiences (qualitatively determined through their responses to the open-ended questions) made the inferences from the study much stronger. Having both sources of data also made the reporting of the results much more interesting.

Among the MM issues related to strength of inferences is the issue of integration. Without effective integration you have a multimethod study that includes collection of QUAL and QUAN strands. Integration "means to combine and structure the different elements of the process into a unified, coherent whole. Perhaps most important of all, it gives equal consideration to each element without privileging one element over another" (Plowright, 2011, pp. 4–5). Such integration can occur at any stage of a research project, from initiation to inference. We will discuss in Chapter 4 that in our view, an effective mixed methods study is guided by an integrated mixed methods question as an input to the research process. In such a case, integration begins from the initiation stage and continues throughout the study. In Chapter 10, we show that the final answers to such a question should also be an integrated inference (i.e., a meta-inference; for examples, see Creamer, 2018, p. 111) that reflects a deeper and more extended understanding of the phenomenon under study than in monoapproach research. Such an inference is a *gestalt*—a whole that is bigger than the sum of its parts (Tashakkori & Teddlie, 1998)

Providing the Opportunity for a Greater Assortment of Divergent Views

What happens if the QUAN and the QUAL components lead to two totally different (or contradictory) conclusions? (See Chapter 10 for more details on this issue.) According to Erzberger and Prein (1977), divergent findings are valuable in that they lead to a reexamination of the conceptual frameworks and the assumptions underlying each of the two components. Divergent findings may lead to at least five integrative strategies: (1) the possible transformation of data types (quantitizing, qualitizing) for reanalysis and integration, (2) inference quality audits (Tashakkori & Teddlie, 1998, 2008) to make sure other possible explanations of the results are ruled out with some certainty, (3) development of a broader conceptual framework that incorporates one set of conclusions under another (i.e., elaboration/bolstering,

complementarity, delimiting), (4) development of a higher-level explanation that can encompass both sets of divergent conclusions (we discuss this under "transcendence" in Chapter 10), and (5) the design of a new study or strand to explore possible reasons for the discrepancy.

Deacon, Bryman, and Fenton (1998) summarized the advantages of this reexamination:

> Whatever short-term inconvenience this may cause, in many cases the reappraisal and re-analysis required can reap long term analytical rewards: alerting the researcher to the possibility that issues are more multifaceted than they may have initially supposed, and offering the opportunity to develop more convincing and robust explanations of the social processes being investigated. (p. 61)

The different inferences from MM research often reflect different voices and perspectives. Such diversity of opinion is welcome in MM research.

Trend's (1979) evaluation study, presented in detail in Chapter 1, is a good example of how MM research allows for the presentation of divergent viewpoints. The QUAN data in Trend's study initially indicated that the federal housing subsidy program was working, but divergent information from the QUAL data indicated some serious implementation problems. The results were painstakingly reconciled by a two-evaluator team who used a context-specific explanation to clarify the discrepant results.

The utility of the MM approach has been recognized in a wide variety of disciplines. For instance, seven separate chapters on MM research from different fields were contained in the *Handbook of Mixed Methods in Social and Behavioral Research* (Tashakkori & Teddlie, 2003a): psychology, sociology, education, evaluation research, management and organizational research, the health sciences, and nursing. Bergman's (2018) discussion of the utility of MM in migration research is perhaps applicable to many other types of research as well:

> . . . Designed for different entry points and flexible enough to take on board various stakeholder positions, mixed methods research could be successfully used to develop new ways of thinking about and studying known phenomena or capturing new phenomena, replacing or improving on outdated or unsuitable ways of studying phenomena, or confirming the relevance of known phenomena in a new context. Exploration, complementarity, and convergence—classical justifications for a mixed methods research design—seem highly pertinent to the study of migration. With regard to exploration, for example, a mixed methods approach would be able to explore qualitatively emergent migration dynamics that could lead to better concepts, theories, and measurements when combined with quantitative research components. Complementarity could be achieved when quantitative and qualitative components of a research project are combined such that the quantitative or qualitative results are qualified or expanded based on the results of the qualitative or quantitative results, respectively. Convergence may be assessed when the qualitative component of a mixed methods component, for example, converges with the findings of the quantitative component. Lack of convergence, that is, divergence, may not necessarily put into question the "validity" of the results of the qualitative or quantitative component. Instead, it may be an invitation to further investigation, refinement of the research components, or refinement of the concepts and underlying assumptions of a study. (p. 373)

Box 2.1 summarizes the advantages that MM research brought to evaluation research associated with school reform in Nicaragua from the point of view of the evaluators.

BOX 2.1

Utility of the Mixed Methods Approach in an Evaluation of School Reform

In 1993, the Nicaraguan government undertook a decentralization initiative in education by granting management/budgetary autonomy to certain schools. Major goals of the project were to successfully implement the reform and to enhance student learning. The evaluation was mixed in nature: QUAN methods were used to assess learning outcomes, and QUAL methods were used to assess whether or not the reforms actually took place in the schools.

Rawlings (2000) concluded that the use of the MM approach demonstrated its utility in a number of ways (p. 95). First, the MM approach increased the evaluation capacity in the Ministry of Education due to the intuitive nature of QUAL approach and the robustness and generalizability of the QUAN work. Second, the MM approach strengthened the inferences from the research results through triangulation of both QUAL and QUAN sources.

Third, the QUAL work provided the policy makers with a better understanding of the school contexts, which would have been more difficult to convey with QUAN data alone. Fourth, the research provided insight into the marginalization of teachers and the absence of certain expected outcomes of the reforms, particularly outcomes related to pedagogy. Finally, the MM data highlighted how context affects reform implementation, especially in poor schools with splintered social psychological environments.

SUMMARY

This chapter continues our discussion of the three major approaches to research in the social and behavioral sciences. The descriptions of these communities and of other concepts associated with MM result in the definition of some 75 basic terms in Chapters 1 and 2. While we make distinctions across these three traditions for pedagogical reasons, we also argue that "real" research in the social and behavioral sciences consists of components that are on multiple continua representing different aspects of the QUAL-MM-QUAN. The QUAL-MM-QUAN multidimensional continuum is discussed throughout the text and serves as a foundation for understanding MM research.

We discuss issues related to MM terms and definitions, including the criteria for creating new terms to replace the traditional ones. Some of these new MM terms are introduced. We also discuss the utility of MM research, including three basic reasons why one might use MM rather than one of the traditional approaches.

Chapter 3 is devoted to the philosophy of the social and behavioral sciences. *Philosophy* in this context is defined as the conceptual roots that underlie the quest for knowledge within the human sciences. A basic understanding of that philosophy is required to understand the emergence of MM over the past few decades.

Review Questions and Exercises

1. What is the QUAL-MM-QUAN continuum? Describe the overlapping methodological circles. Explain the continuum in terms of the inductive-deductive dimension or inductive-deductive research cycle.

2. Under what circumstances might it be better to define a new MM term rather than employ already existing "bilingual" terms from the QUAL and QUAN research traditions?

3. What should mixed methodologists do if their QUAL and QUAN results diverge or lead to different interpretations of the phenomenon under study?

4. Describe six key differences among the three communities of social and behavioral scientists.

5. Describe a hypothetical research study that requires MM. Describe how you would integrate the collection of QUAN and QUAL data in that study.

6. Examine the MM research study in Appendix A (described in Chapter 1). In your own words, answer the following questions:

   a. What was the overall purpose of this study?

   b. What are the quantitative research questions?

   c. What are the qualitative research questions?

   d. How are the quantitative and qualitative questions linked?

   e. What is the sample for the quantitative component of the study? How was it selected?

   f. What is the sample for the qualitative component of the study? How was it selected?

   g. What is the quantitative data source?

   h. What are the qualitative data sources?

   i. Summarize the quantitative analyses and how they addressed the quantitative research questions.

   j. Summarize the qualitative analyses and how they addressed the qualitative research questions.

   k. How were concerns about the quality of the quantitative data addressed?

   l. How were concerns about the quality of the qualitative data addressed?

   m. What methods were used to integrate the qualitative and quantitative components of the study?

Key Terms

Integration 42

Multimethod designs 47

Quasi-mixed methods designs 47