



Foundations of Mixed Methods Research

Integrating Quantitative and Qualitative
Approaches in the Social and Behavioral Sciences

Charles Teddlie / Abbas Tashakkori



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Approaches in the Social and Behavioral Sciences



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Preface

This is our third book on mixed methods in the social and behavioral sciences, following up on *Mixed Methodology: Combining the Qualitative and Quantitative Approaches* (1998) and *Handbook of Mixed Methods in Social and Behavioral Research* (2003). This book is noticeably different from the other two books in many ways, and yet it is undeniably similar in others.

Mixed Methodology: Combining the Qualitative and Quantitative Approaches was one of a handful of books that appeared in the late 1980s and 1990s, heralding mixed methods as a third methodological approach in the human sciences. *Handbook of Mixed Methods*, written by a talented group of authors who were already practicing mixed methods in their own diverse fields, was a declaration of the independence of mixed methods from qualitative and quantitative approaches. Probably more than any other source at this point in time, the *Handbook* has demonstrated the diversity and richness of ideas in or about mixed methods both within and across disciplines.

This book, *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*, is different from the other books in that it chronicles a number of interesting and exciting changes that have occurred over the past 5–10 years as mixed methods research has matured and is intended to serve as a textbook as well as a sourcebook. *Foundations* is similar to the other two books in that it features several familiar topics of continued importance to the mixed methods community.

The two purposes of *Foundations* (as a sourcebook and textbook) are linked by commonality of material and separated by complexity of presentation. We can only hope that we have not made the book too simple for professional scholars and researchers or too complex for students just learning about mixed methods.

The structure of *Foundations* includes two sections and an epilogue. The two sections are “Mixed Methods: The Third Methodological Movement” (Chapters 1–5) and “Methods and Strategies of Mixed Methods Research” (Chapters 6–12). The first section focuses on definitions, history, utility, and paradigm issues, whereas the second section takes the reader through the mixed methods process—from asking research questions to drawing inferences from results.

This book covers six issues previously discussed in the *Handbook* plus six additional topics. The six issues from the *Handbook* are discussed in the following chapters of this text:

1. The nomenclature and basic definitions used in mixed methods research: Chapters 1 and 2
2. The utility of mixed methods (why we do it): Chapters 1 and 2
3. The paradigmatic foundations for mixed methods research: Chapter 5
4. Design issues in mixed methods research: Chapter 7
5. Issues in drawing inferences in mixed methods research: Chapter 12
6. The logistics of conducting mixed methods research: Chapters 6 through 12

Six additional areas are addressed in *Foundations*:

1. The history of mixed methods research—from antiquity through the 21st century: Chapters 3 and 4
2. Mixed methods research questions: Chapter 6
3. Sampling issues in mixed methods research: Chapter 8
4. Data collection issues in mixed methods research: Chapters 9 (pre-data-collection considerations) and 10 (data collection)
5. The analysis of mixed methods data: Chapter 11
6. Identification and presentation of mixed methods examples and exemplars of mixed methods research: found throughout, especially in Chapters 6 through 12

We revisit several of these issues in the epilogue, which is concerned with unresolved and future issues. We share with the reader some of our own reflections and concerns about the current state of methodology in the social, behavioral, health, and educational research fields. These issues include political concerns, guidelines for conducting and publishing mixed research, and pedagogical topics.

Because this book serves as a textbook, we have included several pedagogical tools, such as content summaries and objectives at the beginning of each chapter, chapter summaries and previews at the end of each chapter, key terms and a glossary, and review questions and exercises. We have also included three exemplary studies in appendices to the text, which can be found at our companion Web site (www.sagepub.com/foundations). Several review questions are linked to these appendices.

Readers should note that words in **bold** indicate that they are key terms for the chapter where they are located. Words in *italic* indicate (1) a key term that has already appeared but is also important in the current chapter, (2) an important term new to the current chapter but not designated as a key term, (3) words or phrases highlighted for emphasis, or (4) words referred to as terms (e.g., the term *multimethods* on p. 20).

The glossary presents almost 300 terms associated with mixed methods, including essential qualitative and quantitative terms. Some of the definitions in this glossary were taken from the glossary of the *Handbook*, others came from authors currently writing about mixed methods, and still others are original to our design, analysis, and inference typologies and frameworks.

We had multiple editors while producing *Foundations*, starting with C. Deborah Laughton, who helped us conceptualize the book, and ending with Vicki Knight, who greatly facilitated our completing it. Our Sage team included Sean Connelly and Lauren Habib, and we thank them for all of their contributions. We also thank two sets of anonymous reviewers (2004, 2007), whose comments strengthened the book.

We want to acknowledge Burke Johnson as coauthor of Chapters 3 and 4, which outline the history of mixed methods research. Through his collaboration and contribution, Burke has enhanced our understanding of many philosophical and historical issues related to mixed methods research.

Many of our current and previous students have enriched this book (and our own learning) through the years. We would like to thank Tiffany Vastardis for her assistance in preparing the sections on ethics and Dr. Fen Yu for her assistance in organizing the glossary. Our special thanks also go to Mary Anne Ullery and Drs. Maria G. Lopez and Tarek Chebbi for their assistance in locating some of the examples.

We want to especially thank the members of the mixed methods community, who have provided us with so many of the concepts that enliven *Foundations*. These scholars are recognized throughout, particularly in Chapter 4, where we delineate three distinct subgroups: those from the United States; those from Europe, where there has been a healthy mixed methods scene for some time; and those from the World Bank, who have contributed a number of important, international mixed methods studies over the past few years. Two special colleagues among them, Vijayendra Rao and Michael Woolcock, were more than kind in sharing their work and their ideas with us.

One final note—we apologize for using the terms *qualitative* and *quantitative* so many times in this book, especially because we advocate that there is no dichotomy but rather a continuum between the terms. We use these terms in many discussions in this book, as proxies for a variety of diverse and complex concepts, constructs, techniques, political/personal ideologies and lenses, and even marketing tools. Although we use the terms as an artificial dichotomy at times, we try to demonstrate that they represent positions along multiple dimensions, each consisting of a continuum. These terms are perhaps necessary now for pedagogical reasons, but *mixed methods research will have taken a quantum leap forward when they no longer permeate our writings*.

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SECTION I

Mixed Methods

The Third Methodological Movement

CHAPTER 1

Mixed Methods as the Third Research Community

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Objectives

Upon finishing this chapter, you should be able to:

- Explain what Kuhn meant by the term *paradigm* and the concept of a community of researchers
- Distinguish among the three communities of researchers in the social and behavioral sciences: qualitatively oriented methodologists, quantitatively oriented methodologists, and mixed methodologists
- Explain the differences in how researchers from the three methodological communities approach a research problem

- Describe the paradigms debate, using the concepts of the incompatibility and compatibility theses
- Discuss the issue of coexistence among the three research communities

Mixed methods research has been called the third path (Gorard & Taylor, 2004), the third research paradigm (Johnson & Onwuegbuzie, 2004), and the third methodological movement (Teddle & Tashakkori, 2003) by various individuals writing in the field. We refer to it as the *third research community* in this chapter because we are focusing on the relationships that exist within and among the three major groups that are currently doing research in the social and behavioral sciences.

Mixed methods (MM) research has emerged as an alternative to the dichotomy of qualitative (QUAL) and quantitative (QUAN) traditions during the past 20 years. Though this book focuses on MM, its relatively recent emergence must be examined within the context of its two older cousins. We believe that MM research is still in its adolescence, and this volume seeks to more firmly establish the foundations for this approach.

This chapter has three purposes: (1) to briefly introduce the three communities of researchers in the social and behavioral sciences, (2) to demonstrate how the three research orientations differentially address the same research problem, and (3) to briefly discuss issues related to conflict and concord among the three communities.

Several terms are briefly introduced in Chapter 1 and then presented in greater detail later in the book. Because paradigms are referred to throughout Chapter 1, we define the term here. A **paradigm** (e.g., positivism, constructivism, pragmatism) may be defined as a “worldview, complete with the assumptions that are associated with that view” (Mertens, 2003, p. 139). Each of the three communities of researchers in the social and behavioral sciences has been associated with one or more paradigms.

The Three Communities of Researchers in the Social and Behavioral Sciences

Basic Descriptions of the Three Methodological Movements

In general, researchers in the social and behavioral sciences can be categorized into three groups:

- Quantitatively oriented social and behavioral scientists (**QUANs**) primarily working within the postpositivist/positivist paradigm and principally interested in numerical data and analyses
- Qualitatively oriented social and behavioral scientists (**QUALs**) primarily working within the constructivist paradigm and principally interested in narrative data and analyses
- **Mixed methodologists** working within the pragmatist paradigm and interested in both narrative and numeric data and their analyses

These three methodological movements are like communities in that members of each group share similar backgrounds, methodological orientations, and research ideas and practices. There appear to be basic “cultural” differences between these researchers in terms of the manner in which they are trained, the types of research programs they pursue, and the types of professional organizations and special interest groups to which they belong. These cultural differences contribute to a distinct sense of community for each group.

Thomas Kuhn (1970) described such scientific communities as follows:

Scientists work from models acquired through education and through subsequent exposure to the literature often without quite knowing or needing to know what characteristics have given these models the status of *community* paradigms. (p. 46)

These three methodological communities are evident throughout the social and behavioral sciences and continue to evolve in interesting and sometimes unpredictable ways.

The Quantitative Tradition: Basic Terminology and Two Prototypes

The dominant and relatively unquestioned methodological orientation in the social and behavioral sciences for much of the 20th century was QUAN and its associated postpositivist/positivist paradigm. **Quantitative (QUAN) methods** may be most simply and parsimoniously defined as the techniques associated with the gathering, analysis, interpretation, and presentation of numerical information.

QUAN researchers originally subscribed to the tenets of **positivism**—the view that “social research should adopt scientific method, that this method is exemplified in the work of modern physicists, and that it consists of the rigorous testing of hypotheses by means of data that take the form of quantitative measurements” (Atkinson & Hammersley, 1994, p. 251). **Postpositivism** is a revised form of positivism that addresses several of the more widely known criticisms of the QUAN orientation, yet maintains an emphasis on QUAN methods.¹

For instance, the original position of the positivists was that their research was conducted in an “objective,” value-free environment; that is, their values did not affect how they conducted their research and interpreted their findings.

Postpositivists, on the other hand, acknowledge that their value systems play an important role in how they conduct their research and interpret their data (e.g., Reichardt & Rallis, 1994).

Research questions guide investigations and are concerned with unknown aspects of a phenomenon of interest. Answers to quantitative research questions are presented in *numerical* form. A **research hypothesis** is a specialized QUAN research question in which investigators make predictions—based on theory, previous research, or some other rationale—about the relationships among social phenomena before conducting a research study. **Quantitative (statistical) data analysis** is the analysis of numerical data using techniques that include (1) simply describing the phenomenon of interest or (2) looking for significant differences between groups or among variables.

A variety of classic texts guides the QUAN community, including a trilogy of works by Donald T. Campbell and associates that constitute the core logic for the tradition (e.g., Campbell & Stanley, 1963; Cook & Campbell, 1979). The third in this series of books, *Experimental and Quasi-Experimental Designs for Generalized Causal Inference* (Shadish, Cook, & Campbell, 2002), was published in the 21st century and effectively updates the QUAN tradition. Berkenkotter (1989) described these books as charter texts for the postpositivist/QUAN orientation.

Boxes 1.1 and 1.2 contain descriptions of two prototypical researchers, named Professor Experimentalista and Professor Numerico, who are members of the QUAN researcher community.²

Box 1.1

Prototypical QUAN Researcher #1: Professor Experimentalista

Professor Experimentalista is employed by the psychology department at Flagship University. She conducts her research in the laboratories of Thorndike Hall, and her subjects are

(Continued)

(Continued)

freshman and sophomore students. Professor Experimentalista works in an area known as attribution theory, and she reads the latest journals to determine the current state of knowledge in that area. She uses the hypothetico-deductive model (described in Chapters 2 and 4) and generates a priori hypotheses based on Smith's XYZ theory (as opposed to Jones's ABC theory). Professor Experimentalista hypothesizes that her experimental group of subjects will respond differently than the control subjects to closed-ended items on a questionnaire devised to measure the dependent variables of interest. With her colleague, Dr. Deductivo, who is known for his ability to ferret out significant results, Dr. Experimentalista tests the hypotheses using statistical analyses.

Box 1.2

Prototypical QUAN Researcher #2: Professor Numerico

Professor Numerico is a medical sociologist at Flagship University. He typically uses questionnaires and telephone interviews to collect his research data. Participants in his studies are adolescents and young adults. Professor Numerico's research focuses on predicting risky behaviors that might lead to contracting AIDS. One of his research interests is to test the adequacy of three theories of behavior prediction: the theory of reasoned action, the theory of planned behavior, and the health belief model. Professor Numerico hypothesizes that the health belief model predicts the risky behaviors of young adults more accurately than the other two theories. He uses complex statistical procedures to predict participants' behaviors based on a number of potentially important factors.

The Qualitative Tradition: Basic Terminology and a Prototype

Qualitatively oriented researchers and theorists wrote several popular books during the last quarter of the 20th century. The authors of these texts were highly critical of the positivist orientation and proposed a wide variety of alternative QUAL methods. Their critiques of positivism, which they pejoratively labeled the received tradition, helped establish QUAL research as a viable alternative to QUAN research.

Qualitative (QUAL) methods may be most simply and parsimoniously defined as the techniques associated with the gathering, analysis, interpretation, and presentation of *narrative* information.

Many qualitatively oriented researchers subscribe to a worldview known as **constructivism** and its variants (e.g., Howe, 1988; Lincoln & Guba, 1985; Maxcy, 2003). Constructivists believe that researchers individually and collectively construct the meaning of the phenomena under investigation.³

Answers to qualitative research questions are narrative in form. **Qualitative (thematic) data analysis** is the analysis of narrative data using a variety of different inductive⁴ and iterative techniques, including categorical strategies and contextualizing (holistic) strategies. Because these strategies typically result in themes, QUAL data analysis is also referred to as thematic analysis.

The QUAL community also has a variety of classic texts, including Glaser and Strauss (1967), Lincoln and Guba (1985), Miles and Huberman (1984, 1994), Patton (1990, 2002), Stake (1995), and Wolcott (1994). Three editions of the *Handbook of Qualitative Research* (Denzin & Lincoln, 1994, 2000a, 2005a) have enjoyed great popularity and may be considered charter texts for the constructivist/QUAL orientation. Box 1.3 contains a description of the prototypical QUAL researcher, named Professor Holistico, who is a member of the QUAL research community.

The Mixed Methods Tradition: Basic Terminology and a Prototype

The MM research tradition is less well known than the QUAN or QUAL traditions because it has emerged as a separate orientation during only the past 20 years. Mixed methodologists present an alternative to the QUAN and QUAL traditions by advocating the use of whatever methodological tools are required to answer the research questions under study. In fact, throughout the 20th century, social and behavioral scientists frequently employed MM in their studies, and they continue to do so in the 21st century, as described in several sources (e.g., Brewer & Hunter, 1989, 2006;

Greene, Caracelli, & Graham, 1989; Maxwell & Loomis, 2003; Tashakkori & Teddlie, 2003a).

Mixed methods (MM) has been defined as “a type of research design in which QUAL and QUAN approaches are used in types of questions, research methods, data collection and analysis procedures, and/or inferences” (Tashakkori & Teddlie, 2003a, p. 711). Another definition appeared in the first issue of the *Journal of Mixed Methods Research*, in which MM research was defined as “research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry” (Tashakkori & Creswell, 2007b, p. 4).

The philosophical orientation most often associated with MM is pragmatism (e.g., Biesta & Burbules, 2003; Bryman, 2006b; Howe, 1988; Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Morgan, 2007; Tashakkori & Teddlie, 1998, 2003a), although some mixed methodologists are more philosophically oriented to the *transformative perspective* (e.g., Mertens, 2003). We defined pragmatism elsewhere as

a deconstructive paradigm that debunks concepts such as “truth” and “reality” and focuses instead on “what works” as the truth

Box 1.3

Prototypical QUAL Researcher: Professor Holistico

Professor Holistico is employed by the anthropology department at Flagship University. He conducts his research regarding female gang members in urban high schools around the state. Professor Holistico is developing a theory to explain the behaviors of these individuals, some of whom he has gotten to know very well in his 2 years of ethnographic data gathering. It took some time for him to develop trusting relationships with the young women, and he has to be careful to maintain their confidence. He has gathered large quantities of narrative data, which he is now reading repeatedly to ascertain emerging themes. He discusses his experiences with his colleague, Professor Inductiva, who is known for her keen analytical abilities and use of catchy metaphors. To check the trustworthiness of his results, Professor Holistico will present them to members of the gangs in a process known as member checking.

regarding the research questions under investigation. Pragmatism rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in interpretation of results. (Tashakkori & Teddlie, 2003a, p. 713)

MM research questions guide MM investigations and are answered with information that is presented in *both narrative and numerical* forms. Several authors writing in the MM tradition refer specifically to the centrality of the research questions to that orientation (e.g., Bryman, 2006b; Erzberger & Kelle, 2003; Tashakkori & Teddlie, 1998).

Mixed methods data analysis involves the integration of statistical and thematic data analytic techniques, plus other strategies unique to MM (e.g., data conversion or transformation), which are discussed later in this text. In properly conducted MM research, investigators go back and forth seamlessly between statistical and thematic analysis (e.g., Onwuegbuzie & Teddlie, 2003).

Mixed methodologists are well versed in the classic texts from both the QUAN and QUAL traditions as well as a growing number of well-known works within the MM field (e.g.,

Creswell, 1994, 2003; Creswell & Plano Clark, 2007; Greene, 2007; Greene & Caracelli, 1997a; Johnson & Onwuegbuzie, 2004; Morgan, 1998; Morse, 1991; Newman & Benz, 1998; Reichardt & Rallis, 1994; Tashakkori & Teddlie, 1998, 2003a). Box 1.4 contains a description of a prototypical MM researcher named Professor Eclectica, who is a member of the MM community.

An Example of How the Three Communities Approach a Research Problem

Introduction to an Evaluation Study (Trend, 1979)

An often-referenced article from the MM literature is a study conducted by Maurice Trend (1979) involving the evaluation of a federal housing subsidy program involving both QUAN and QUAL methods. Others have used this article to demonstrate several aspects of MM research, such as the difficulty of conducting studies using researchers from both the QUAL and QUAN orientations (e.g., Reichardt & Cook, 1979); how MM research can be informed by the separate components of QUAL and QUAN research

Box 1.4

Prototypical Mixed Methodologist: Professor Eclectica

Professor Eclectica is employed in the School of Public Health at Flagship University. She is interested in children's health issues, especially the prevention of diabetes in middle-school children. Her research program involves both hypotheses related to weight loss and research questions related to why certain interventions work. Professor Eclectica was trained as a sociologist and has expertise in QUAN data analysis that began with her dissertation. She has also gained skills in QUAL data gathering and analysis while working on an interdisciplinary research team. Her research involves interventions with different types of cafeteria offerings and differing types of physical education regimens. She spends time in the field (up to 2 weeks per site) interviewing and observing students to determine why certain interventions work while others do not. Her analyses consist of a mixture of QUAL and QUAN procedures. She describes her research as *confirmatory* (the research hypothesis regarding weight) and *exploratory* (the research questions regarding why different interventions succeed or fail). She tries to integrate her QUAL and QUAN results in dynamic ways to further her research program.

(Maxwell & Loomis, 2003); the value and credibility of QUAL and QUAN data when discrepancies occur (Patton, 2002); and the balance in results that can be achieved when differences between the QUAL and QUAN components are properly reconciled (e.g., Tashakkori & Teddlie, 2003c).

In this chapter, we use the Trend (1979) study in a different way: as a vehicle for demonstrating how the three research communities address the same research problem. Although the study became mixed as it evolved, it started out with two separate components: one QUAN and one QUAL. It became mixed when the evaluators had to write reports that synthesized the results from the two separate components. Trend (1979) described the components of the study as follows:⁵

Three types of reports were envisioned by HUD and Abt Associates. The first consisted of comparative, cross-site function reports. They were to be based mostly on quantitative analysis and would evaluate program *outcomes*. Eight site case studies were planned as a second kind of product. These were designed as narrative, qualitatively based pieces that would enrich the function reports by providing a holistic picture of program *process* at the administrative agencies. A final report would then digest the findings of all the analyses and convert these into policy recommendations. (p. 70, italics in original)

Trend's (1979) opinion was that "different analyses, each based upon a different form of information, should be kept separate until late in the analytic game" (p. 68). Because the QUAL and QUAN components were conducted separately from start to finish, followed by Trend's MM meta-analysis using both sources, this study provides a unique example of how the three communities approach the same research scenario.

The overall project consisted of eight sites located in different areas of the United States. At each site an administrative agency was selected to implement a federal housing subsidy program, whose goal was to provide better housing for low-income families. Each site was to serve up to 900 families. Trend's (1979) article focused on

the results from one site (Site B), which had three distinct geographical areas: two rural areas with satellite offices and one urban area with the site's central office.

The Quantitative Approach to the Evaluation Study

The QUAN component of this study is a good example of an *outcomes-based evaluation*, where the emphasis is on whether a program has met its overall goals, typically measured quantitatively.⁶ The QUAN component was set up to determine if the use of direct-cash housing allowance payments would help low-income families obtain better housing on the open market. The QUAN research questions in this study, which were established before the evaluation began, included the following:

- Did the sites meet their stated goals in terms of enrolling families in the program (i.e., up to 900 families per site)?
- Was the minority population (African American) represented proportionally in the number of families served by the program?
- Did participants actually move to better housing units as a result of the program?
- Were potential participants processed "efficiently"?
- Did the sites exert proper financial management?

Teams of survey researchers, site financial accountants, and data processors/analysts at the Abt Associates headquarters conducted the QUAN component of the study. Numeric survey data were gathered on housing quality, demographic characteristics of participants, agency activities, expenses, and other relevant variables. A common set of six forms was employed to follow the progress of participating families. Teams of survey researchers interviewed samples of participants at scheduled times during the process using structured interview protocols. Accountants kept track of all expenditures, and this information became part of the database. Trend (1979) noted that "eventually, the quantitative data base

would comprise more than 55 million *characters*" (p. 70, italics in original).

In summary, this component of the evaluation exhibited several prototypical characteristics of QUAN research, including the establishment of well-articulated research questions before the study started, the development and use of numeric scales to measure outcome variables of interest, the employment of professional data gatherers (e.g., survey researchers, accountants) to collect information, and the statistical analysis of the data using computers at a central location. Significant efforts were put into generating an "objective" assessment of the success of the federal housing subsidy program using QUAN techniques.

The computer-generated QUAN outcome data indicated that Site B had done quite well compared to the other sites. Site B completed its quota of enrolling 900 households in the

program, and participants experienced an improvement in housing quality that ranked second among the eight sites. Trend (1979) stated additional results of the study: "The cost model indicated that the Site B program had been cheap to run. Revised calculations of site demography showed that minorities were properly represented in the recipient population" (p. 76). Figure 1.1 illustrates the conclusions from the QUAN component of this study.

The Qualitative Approach to the Evaluation Study

The QUAL component of this study is a good example of a *process-based evaluation*, where the focus is on how the program is implemented and how it is currently operating or functioning,



Figure 1.1 QUAN Researcher's Point of View