1

OVERVIEW OF CONTEMPORARY ISSUES IN MIXED METHODS RESEARCH

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Objectives

The objectives of this chapter are:

- to present the organizational structure of the *Handbook,* both in words and visually in terms of three overlapping circles corresponding to the three parts of the volume;

- to summarize the core characteristics of MMR, which are widely acknowledged by many, if not most, scholars writing in the field;

- to present an overview of issues or controversies that are important to the contemporary field of MMR; and

- to describe each of these issues, explaining why each is important and providing information on diverse points of view regarding them;

This is the second edition of the *SAGE Handbook of Mixed Methods in Social & Behavioral Research* (subsequently referred to as the *Handbook*). While only 7 years have passed since the publication of the first edition, the landscape of mixed methods research (MMR) has changed remarkably due to the large number of significant works that have been published in the interim (e.g., Bergman, 2008; Brannen, 2005; Creswell & Plano Clark, 2007; Gorard & Taylor, 2004; Greene, 2007, 2008; Johnson & Onwuegbuzie, 2004; Johnson, Onwuegbuzie, & Turner, 2007; Mertens, 2007; Morgan, 2007; Morse & Niehaus, 2010; Plano Clark & Creswell, 2008; Ridenour & Newman, 2008; Teddlie & Tashakkori, 2009).

In the first edition, published in 2003, we asked two basic questions: (1) Why do we need a *Handbook* in this field at this point in time? (2) What major issues and controversies will this *Handbook* address? The question regarding why we need a *Handbook* was important in 2003 when MMR was just formally emerging as a distinct methodological field: We needed a *Handbook* at that time to help legitimize the field as an alternative to qualitative and quantitative methods. With regard to the current *Handbook,* the answer to the "why" question is twofold: (1) to chronicle the advances made in the field over the past 7 years and (2) to present a comprehensive snapshot of the field of MMR as the decade of the 2010s begins. Therefore, we have carefully selected the chapters contained in the current *Handbook* to generate a diverse and representative overview of what the field has accomplished and what it looks like now in terms of a wide variety of topical areas.[1]

Answering the second question (what major issues and controversies will this *Handbook* address?) is complicated, given the broad range of important topics now facing the field. Which issues and controversies are most salient and pervasively written about in 2010? Some of these issues might include:

- What are the boundaries of MMR as a field, especially as it is being adapted in one form or another into virtually all the pure and applied social and behavioral sciences? As adaptation occurs differentially across these disciplines, what are the basic core characteristics of MMR? Should these basic core characteristics be broadly defined so that the field can serve as a "big tent," or do we need a narrowly defined set of attributes that more precisely define the field? What constitutes the structure or "map" of MMR (Creswell, 2009, 2010 [this volume])?

- What is the relative importance of conceptual issues as opposed to issues of method and methodology in MMR? Should contemporary writing continue to stress both, or is it time for another phase of MMR, perhaps focusing more on issues of method and methodology? What is the relationship between conceptual orientation and how we conduct MMR?

- What is the relationship of MMR to the other broadly defined methodological areas: qualitative (QUAL) research and quantitative (QUAN) research? Is MMR an amalgamation or mixture of the other basic approaches, or does it constitute a distinct approach toward social science inquiry itself (e.g., Greene, 2008)? Should it have its own unique language, should we develop a common language that allows us to talk across methodological boundaries, or should it be a combination of the two (e.g., Teddlie & Tashakkori, 2003)?

We engage these and other issues in this chapter by first presenting the organizational structure for the *Handbook,* which can also be seen as an evolving blueprint for the field of MMR. Following this discussion, we turn our attention to the nature and general characteristics of MMR, examining

seemingly common elements that have emerged as the field has developed over the past 30 years. Identification of these common or core characteristics is important as the field matures. We then examine issues and challenges of contemporary MMR, which we believe are the most important areas currently being discussed or debated in the field.

◆ *Organization of the* SAGE Handbook of Mixed Methods in Social & Behavioral Research, *2nd Edition*
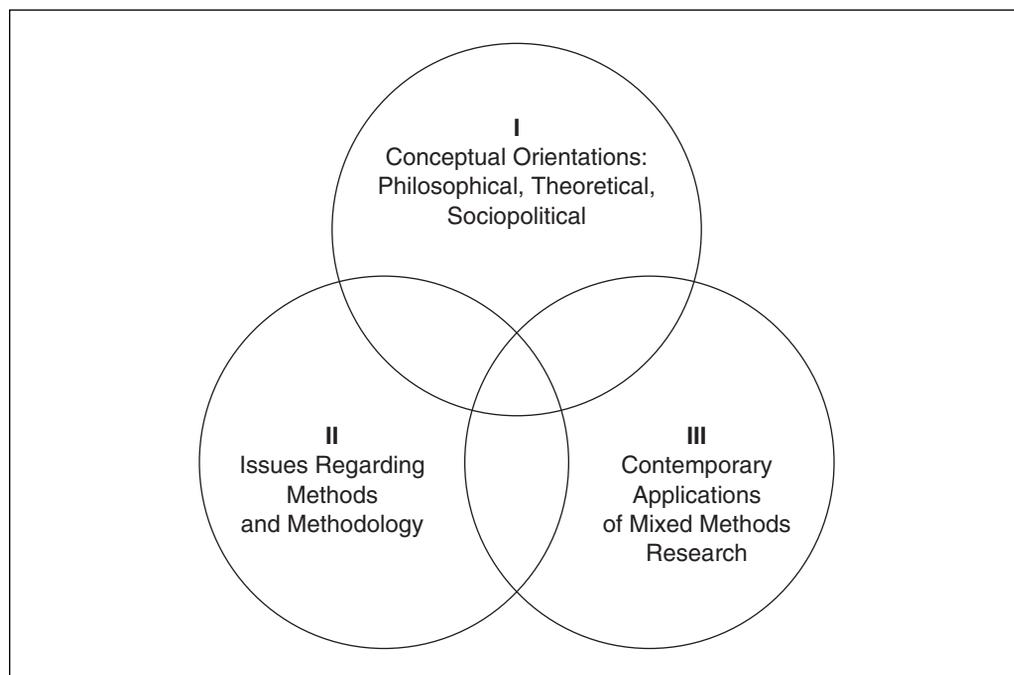
THE THREE PARTS OF THE HANDBOOK

The volume is divided into three separate parts, depicted as overlapping circles in Figure 1.1:

- Part I. Conceptual Issues: Philosophical, Theoretical, Sociopolitical

- Part II. Issues Regarding Methods and Methodology

- Part III. Contemporary Applications of Mixed Methods Research

As we were organizing the *Handbook*, it seemed to us that chapters could be divided into three basic categories: (1) those dealing with conceptual issues such as philosophical assumptions or beliefs, theoretical frameworks, sociopolitical concerns, historical perspectives, and so forth; (2) those concerned with the "how to" of MMR, both in terms of specific methods (strategies and procedures) and broader approaches to scientific inquiry using mixed methods; and (3) applications of mixed methods within and across specific academic disciplines and with regard to special topical areas (e.g., pedagogy, collaborative

Figure 1.1 Overlapping Components of an Emerging "Map" of Mixed Methods Research

Note: These circles portray the information contained in the three parts of this volume.

research strategies). Although these broad domains overlap, it is obvious from reading the chapters in each part as a group that each part has a distinctive emphasis.

AN OVERVIEW OF PART I OF THE HANDBOOK

The section of the *Handbook* titled "Conceptual Issues: Philosophical, Theoretical, Sociopolitical" (Chapters 2 through 11)[2] has a deliberately broad title to cover the numerous topics contained within it. Although some authors in Part I avoid the use of the term *paradigm,* they address issues intrinsic to the philosophical foundations of social inquiry such as *epistemology* (beliefs about the nature of knowledge, including those related to the objectivity/ subjectivity dualism); *axiology* (beliefs about the role of values or ethics in conducting research), *ontology* (beliefs about the nature of reality), and others (e.g., the possibility of generalizations, the nature of causality). Chapter 9 by Niglas catalogs many of the philosophical dimensions discussed in Part I, portraying them as continua rather than dichotomies, which is an oft repeated distinction in the mixed methods literature.

Issues related to the epistemological foundations have been central to MMR since its inception and continue to be featured in this volume. These issues link the nature of knowledge and the most appropriate ways of producing that knowledge, which for MMR has included the synergy of combining the QUAL and QUAN approaches. Biesta's Chapter 4 in Part I engages epistemological issues by positing *intersubjectivity* (a common world that we create from our individual subjective worlds) as an alterative to the either-or of subjectivism and objectivism. Similarly, the chapters by Johnson and Gray, Greene and Hall, Maxwell and Mittapalli, and others in Part I address epistemological issues in their perspectives on the nature and kinds of knowledge that can be produced using MMR.

While epistemological considerations have been prominent throughout the history of MMR, axiological issues are featured foremost in the Part I chapters by Hesse-Biber (the importance of *axiological practice* in her feminist theoretical approach) and Mertens, Bledsoe, Sullivan, and Wilson (the *axiological assumption,* which has precedence in their transformative paradigm). These chapters emphasize what Greene (2008) calls the *sociopolitical commitments domain* of MMR, which she describes as the "location of social science in society" (p. 10). Greene considers sociopolitical issues as a distinct domain in MMR, yet one that is related to philosophical issues. Creswell (2010 [this volume]) also discusses these issues as part of what he calls the *politicization* of MMR, an area in which he includes topics such as deconstructing and justifying mixed methods. For us, the sociopolitical domain of MMR is an area where the individual axiological orientations of researchers are applied to the concerns and problems of the real world contexts within which they work.

Ontological considerations per se do not feature as prominently in the mixed methods literature, or in this *Handbook,* as those of epistemology or axiology. In Chapter 3, Johnson and Gray characterize what they consider the mixed methods position on this issue as *ontological pluralism* or *multiple realism,* which "fully acknowledges the 'realities' discussed in QUAL and in QUAN and . . . rejects singular reductionisms and dogmatisms" (**p. 72**). The Maxwell and Mittapalli chapter in Part I presents their version of critical realism, which combines a *realist ontology* (a "real" world exists independent of our perceptions) with a constructivist epistemology (our understanding of this "real" world is a construction based on our own perspectives and points of view). Critical (or scientific) realism is endorsed by others in the *Handbook* (e.g., Christ's chapter in Part III), and is one of the philosophical orientations considered by the hypothetical researcher "Michelle" in Greene and Hall's Chapter 5

description of how the dialectic stance informs practice.

Another component of Circle I in Figure 1.1 concerns *theoretical frameworks,* which operate at a different level of abstraction than philosophical considerations (e.g., Creswell, 2010; Crotty, 1998). A theoretical perspective,[3] such as feminism or attribution theory or the contingency theory of leadership, refers to a "unified, systematic explanation of a diverse range of social phenomena" (Schwandt, 1997, p. 54). Greene's (2007) description of the *substantive theory stance* in MMR states, "What matters most in guiding inquiry decisions are the substantive issues and conceptual theories relevant to the study being conducted, not philosophical paradigms in and of themselves" (p. 69). Creswell (2010) similarly distinguishes between philosophical assumptions and a theoretical lens, concluding that we need a better understanding of how distinct theoretical perspectives can be used in MMR. The only example of an explicitly stated theoretical framework in Part I is Hesse-Biber's chapter on how the feminist theoretical perspective affects the manner in which MMR is conducted. As MMR expands throughout various disciplines in the human sciences, it could be that theoretical perspectives indigenous to those fields of inquiry (or cutting across them) will strongly influence how mixed methods are employed within them.

Chapter 5 by Johnson and Gray is an important contribution because it grounds MMR within the history of the philosophy of science. It traces prior attempts to integrate QUAL and QUAN research by identifying *proto-mixed methods thinkers* (e.g., Aristotle, Abelard, Kant) and discussing how their work exhibited the *spirit* of MMR. It is important for practitioners of MMR to understand that the conceptual foundation for this approach has been a de facto part of the philosophy of science for as long as that of the (supposedly) more traditional approaches (Johnson & Gray, 2010 [this volume]; Teddlie & Johnson, 2009a, 2009b).

AN OVERVIEW OF PART II OF THE HANDBOOK

The section of the *Handbook* titled "Issues Regarding Methods and Methodology" (Chapters 12 through 21) includes information related to (1) *methods,* which are specific strategies and procedures for implementing MMR designs, including those associated with design, sampling, data collection, data analysis, and interpretation of findings, and (2) *methodology,* which connotes a broad inquiry logic or general approach to MMR inquiry that guides the selection of specific methods. The commonly used term *methodology* has a variety of slightly different meanings depending on the source (e.g., Crotty, 1998; Greene, 2008; Morgan, 2007; Schwandt, 1997).

In this chapter, we define the *methodology of mixed research* as follows: the broad inquiry logic that guides the selection of specific methods and that is informed by conceptual positions common to mixed methods practitioners (e.g., the rejection of "either-or" choices at all levels of the research process). For us, this definition of methodology distinguishes the MMR approach to conducting research from that practiced in either the QUAN or QUAL approach.

Rejection of the "either-or" leads to a guiding methodological principle of MMR: *methodological eclecticism,* which means that practitioners of mixed methods select and then synergistically integrate the most appropriate techniques from a myriad of QUAL, QUAN, and mixed strategies to thoroughly investigate a phenomenon of interest (Teddlie & Tashakkori, in press). As we continue our discussion in this chapter (and Chapter 31), we will be looking for other guiding principles that mixed methods researchers use as they conduct their work. More details regarding *methodological eclecticism* are presented in a later section on the common core characteristics of MMR.

Before briefly previewing chapters in Part II, we should note that some authors (e.g., Guba & Lincoln, 2005; Lincoln &

Guba, 2000; Mertens, 2007; Mertens, Bledsoe, Sullivan, & Wilson, 2010 [this volume]) define paradigms as consisting of sets of interlocking philosophical assumptions: epistemological, axiological, ontological, and methodological.[4] We discussed the first three of these basic belief systems in Part I on conceptual issues in MMR, but we situate the fourth (methodological assumptions) in Part II. This distinction is an important one, consistent with our belief that conceptual and methodological issues are separable on several dimensions, but that there is an extremely important interface between the two, which we later describe as one of the major contemporary issues in MMR.

The linkage of specific methods with interconnected philosophical beliefs (e.g., Guba & Lincoln, 2005; Lincoln & Guba, 2000; Sale, Lohfeld, & Brazil, 2002) results in the *incompatibility thesis,* which has been widely rejected by the MMR community. The inclusion of methodological issues as part of paradigm considerations also leads to unfortunate and misleading terms such as quantitative paradigm, qualitative paradigm, and mixed methods paradigm, as noted by others (e.g., Gorard, 2010 [this volume]; Gorard & Taylor, 2004). Mixing these terms contributes to conceptual fuzziness in MMR.

Several Part II chapters are concerned with specific methodological topics or techniques in MMR: the generation of research questions (Plano Clark & Badiee), computer-assisted data analysis (Bazeley), visual displays (Dickinson), hermeneutic content analysis (Bergman), and Q methodology/ Q factor analysis (Newman & Ramlo). Other chapters in Part II attempt the difficult task of synthesizing the current MMR literature in broad areas such as research designs (Nastasi, Hitchcock, & Brown), sampling (Collins), data analysis (Onwuegbuzie & Combs), and quality of inferences (O'Cathain). The authors of these chapters search for methodological principles (or synthesizing frameworks) that guide the conduct of MMR in specific research settings.

AN OVERVIEW OF PART III OF THE HANDBOOK

The section of the *Handbook* titled "Contemporary Applications of Mixed Methods Research" (Chapters 22 through 30) includes (1) cross-disciplinary and cross-cultural applications of MMR and (2) practical issues in the applications of MMR (e.g., pedagogy, collaboration, funding). The first edition of the *Handbook* summarized MMR in broad areas such as sociology, psychology, and evaluation research, whereas this volume contains chapters in more specialized areas such as international development evaluation (Bamberger, Rao, & Woolcock), action research (Christ), biographical research (Nilsen & Brannen), educational effectiveness research (Sammons), and intervention research in the health sciences (Song, Sandelowski, & Happ).

The Lieber and Weisner chapter in this section presents an overview of the practical issues that mixed research practitioners face, while the Dahlberg, Wittink, and Gallo chapter discusses funding and publishing issues, and the Christ chapter summarizes issues in MMR pedagogy. In Chapter 29, Harden and Thomas describe how mixed methods techniques can be used in systematic reviews of specific research areas (e.g., children's perspectives and experiences regarding healthy eating). In Chapter 23, Ivankova and Kawamura present an up-to-date analysis of the utilization of MMR from 2000 to 2008 across disciplines, chronicling the sharp increase in incidence rates.

OVERLAPS OR INTERFACES BETWEEN THE THREE PARTS

We recognize that the three circles in Figure 1.1 overlap; in fact, a handful of the *Handbook* chapters could arguably have been placed in more then one section, given that they cover diverse, yet interrelated topics. For example, Gorard's chapter on "Research Design as Independent of

Methods" could have been placed in Part II, but we put it in Part I because of its argument for universal social science research principles devoid of paradigm considerations or schisms between the QUAL and QUAN approaches (see also Onwuegbuzie & Leech, 2005).

We think that the overlaps or interfaces among the three *Handbook* sections, as depicted in Figure 1.1, are among the most valuable characteristics of the organizational structure of this volume. The topics within those overlapping areas are in the "border land" between conceptual issues and methods (Circles I and II), between methods and applications (Circles II and III), and between conceptual issues and applications (Circles I and III). As such, these topics tend to be dynamic and fluid. For instance, how are conceptual issues different from and similar to issues regarding methods and methodology? What does the overlap between these two sections consist of in terms of specific topics? How do conceptual orientations affect the selection of methods, or do they?

Authors of three Part I chapters address the overlap between Circles I and II directly by demonstrating how conceptual orientations are inextricably linked to how MMR is conducted (Greene & Hall; Hesse-Biber; Mertens et al.). On the other hand, Leech (Chapter 11), who interviewed four of the early developers of the field, reported that two of them did not include "philosophy" (or conceptual orientation) in their definitions of MMR (Alan Bryman, Janice Morse), while a third (John Creswell) included it in his 2009 interview with Leech but not in a definition given 2 years earlier (Johnson et al., 2007). The interaction (or lack of it) between conceptual and methodological issues in MMR is a complex and evolving one, which we detail later in this chapter.

Topics in the overlap between methods and applications include issues such as why and how mixed methods are differentially applied across different disciplines. For example, why are mixed methods more easily accepted in some disciplines or specialty areas than others? Why are academic disciplines reluctant to embrace mixed methods (e.g., psychology)? Are mixed methods techniques applied similarly across disciplinary lines, or are there differences?

The overlap between conceptual orientations and applications of MMR also contains some interesting topics. Foremost among these are sociopolitical commitments, which we characterized earlier as the interaction between concerns and problems of the real world and the axiological orientations of researchers.

WHAT IS THE STRUCTURE OR "MAP" OF MIXED METHODS RESEARCH?

The *structure* or "map" of MMR emerged as an important issue as a result of Creswell's (2009, 2010) recent insightful reflections on the topic. He bases the importance of a current map of MMR on a very practical consideration: Authors submitting articles to publications such as the *Journal of Mixed Methods Research* have needed such a structure "so that they could position their study within the existing discussions" ongoing in the field (Creswell, 2009, p. 96).

Creswell (2010) compares three perspectives regarding the current field of MMR (Creswell, 2009; Greene, 2008; Tashakkori & Teddlie, 2003c) that were useful in developing the general domains in his map of MMR. He compares each of these three sources in terms of specific issues and questions that were addressed in their perspectives on MMR. (See Table 2.1 in Creswell, 2010.) The five general domains that Creswell identified are: the essence of mixed methods domain, the philosophical domain, the procedures domain, the adoption and use domain, and the political domain.

Creswell (2009) used a similar set of domains to categorize specific topics (e.g., the use of the QUAL theoretical lens in MMR, joint displays of QUAN and QUAL data) within the literature. We believe that the

generation of a structure or map of MMR, *containing general domains and specific topic areas (or lines of inquiry) within those domains,* would be highly beneficial. We perceive that this structure or map would constantly evolve as new topics (or lines of inquiry) emerge and that the general domains would also be subject to change over time.

From a practical perspective, such a structure or map would allow investigators from various disciplines to situate their projects within a specific line of inquiry associated with MMR. Such a map could have great heuristic value because lines of inquiry can guide investigators toward studies similar to their own areas of interest, which could then help them in further framing their research purposes and questions. Lines of inquiry result in progressively more complex findings and serve as fertile breeding grounds for new research projects that often cross disciplinary boundaries.[5]

THE ORGANIZATIONAL STRUCTURE OF THE HANDBOOK APPLIED TO THE MAP OF MIXED METHODS RESEARCH

The three broad areas depicted in Figure 1.1 (conceptual orientations, methods and methodology, applications of MMR) *serve as the domains in our structure or map of the field of MMR.* We further this discussion in Chapter 31 where we compare the perspectives of Creswell (2010) and Greene (2008) in relation to our map of the field of MMR. Chapter 31 also describes examples of specific lines of inquiry within the broad domains that could guide future MMR studies.

◆ The Nature and General Characteristics of Mixed Methods Research

An issue discussed by Leech (2010 [this volume]), based on her interviews with early

developers of MMR, concerns whether the field is ready to become more "organized and systematic"; that is, are we ready to come to consensus with regard to some basic characteristics about the nature of the field. There was disagreement on this issue, with some sentiment toward seeking greater agreement on basic issues such as language and some concern about moving to convergence too quickly.

We believe that there is general agreement on some characteristics of MMR, and we recently summarized those in a chapter in the forthcoming fourth edition of the *Handbook of Qualitative Research* (Teddlie & Tashakkori, in press). By necessity, these characteristics are very broad (and, even so, we do not expect consensus regarding them), but they at least represent a place to start the dialogue.

The first general characteristic of MMR is what we call *methodological eclecticism,* a term that has only occasionally been used in the literature (e.g., Hammersley, 1996; Yanchar & Williams, 2006). We defined methodological eclecticism earlier in this chapter as selecting and then synergistically integrating the most appropriate techniques from a myriad of QUAL, QUAN, and mixed methods to more thoroughly investigate a phenomenon of interest. This definition goes beyond simply combining QUAL and QUAN methods to cancel out respective weaknesses of one or the other. A researcher employing methodological eclecticism is a *connoisseur of methods,*[6] who knowledgeably (and often intuitively) selects the best techniques available to answer research questions that frequently evolve as a study unfolds.

While this characteristic of MMR may seem so fundamental that it need not be stated, its origins are of importance. Methodological eclecticism stems from rejection of *the incompatibility of methods thesis,* which stated that it is inappropriate to mix QUAL and QUAN methods due to fundamental differences (*incommensurability*) between the paradigms (i.e., postpositivism, constructivism) supposedly underlying those

methods. The alternative to this point of view, the *compatibility thesis*, contends that combining QUAN and QUAL methods is appropriate in many research settings, denying that such "a wedding of methods is epistemologically incoherent" (Howe, 1988, p. 10). The rejection of the incommensurability of paradigms thesis[7] is a major point of demarcation between advocates of MMR and others advocating purist methodological stances.

Methodological eclecticism means that we are free to combine methods and that we do so by choosing what we believe to be the best tools for answering our questions. We have called this choice of "best" methods for answering research questions "design quality"[8] and have included it as an essential part of our framework for determining the inference quality of MMR (Tashakkori & Teddlie, 2008). While we endorse methodological eclecticism, it is also important to recognize that:

1. The best method for any given study in the human sciences may be purely QUAL or purely QUAN, rather than mixed.

2. Most seemingly purist QUAL or QUAN studies might actually include shades of the other approach (i.e., studies that may be placed on multiple continua, each including a shade of QUAL and QUAN approaches. We will discuss this later under the fourth characteristic of MMR).

3. The terms QUAL and QUAN are often proxies for different concepts/attributes across studies (i.e., QUAN approach might mean different things in different studies).

The second contemporary characteristic of MMR is *paradigm pluralism,* or the belief that a variety of paradigms may serve as the underlying philosophy for the use of mixed methods. A variety of conceptual orientations associated with mixed methods are represented in this volume, including pragmatism, critical theory, the dialectic stance, critical realism, and so forth (e.g., chapters by Biesta; Greene & Hall; Maxwell & Mittapalli; Hesse-Biber; Mertens et al.).

We believe that contemporary MMR is a kind of "big tent" and that it is both unwise and unnecessary to exclude individuals from the MMR community because their conceptual orientations are different. We agree with Denzin's (2008) paraphrase of a theme originally stated by Guba (1990): "A change in paradigmatic postures involves a personal odyssey; that is, we each have a personal history with our preferred paradigm and this needs to be honored" (p. 322). Paradigm pluralism calls for practitioners of mixed methods to honor a variety of philosophical or theoretical stances among their colleagues.

The third characteristic of contemporary MMR is *an emphasis on diversity at all levels of the research enterprise,* from the broader, more conceptual dimensions to the narrower, more empirical ones. This characteristic extends to issues beyond the aforementioned methodological eclecticism and paradigm pluralism. For example, MMR can simultaneously address a diverse range of confirmatory and exploratory questions, while single-approach studies often address only one or the other. Properly conducted MMR also provides the opportunity for an assortment of divergent conclusions and inferences due to the complexity of the data sources and analyses involved in the research.

MMR emerged partially out of triangulation literature, which has commonly been associated with the *convergence* of results. Nevertheless, there is a growing awareness that an equally important result of combining information from different sources is *divergence* or dissimilarity (e.g., Erzberger & Kelle, 2003; Greene, 2007; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2008). This emphasis on divergent results often provides greater insight into complex aspects of a phenomenon, which can then lead to more in-depth investigation of previously unexplored aspects of that phenomenon.

The fourth characteristic of contemporary MMR is *an emphasis on continua rather than a set of dichotomies* (e.g., Newman, Ridenour, Newman, & DeMarco, 2003; Niglas, 2004; Patton, 1990, 2002; Tashakkori & Teddlie, 2003c). A hallmark of MMR is its replacement of the either-or from the paradigm debates with continua that describe a range of options from across the methodological spectrum. Johnson and Gray (2010) refer to this antidualistic stance as *synechism,* which involves replacing binaries with continua.

For example, we have applied what we called the QUAL-MIXED-QUAN multidimensional continuum to a variety of research issues, including statement of research questions, designs, data analysis, and validity or inference quality (Teddlie & Tashakkori, 2009). Niglas (2010 [this volume]) has extended this discussion through her multidimensional model of research methodology, which presents a variety of philosophical and methodological continua within a multidimensional space and the placement of specific research methods within that space.

The fifth characteristic of contemporary MMR is *an iterative, cyclical approach to research,* which includes both deductive and inductive logic[9] in the same study (e.g., Krathwohl, 1993, 2004; Tashakkori & Teddlie, 1998). The cycle of research may be seen as moving from grounded results (facts, observations) through inductive logic to general inferences (abstract generalizations or theory), then from those general inferences (or theory) through deductive logic to tentative hypotheses or predictions of particular events/outcomes. Research may start at any point in the cycle: Some researchers start from theories or abstract generalizations whereas others start from observations or other data points. We believe that all MMR projects go through a full cycle at least once, regardless of their starting point (e.g., Teddlie & Tashakkori, 2009).

This cyclical approach to research may also be conceptualized in terms of the distinction between the *context of justification* (associated with deductive logic) and the *context of discovery* (associated with inductive logic), which has recently been discussed in MMR (e.g., Johnson & Gray, 2010; Hesse-Biber, 2010 [this volume]; Teddlie & Johnson, 2009a). While practitioners of MMR recognize the logic of justification as a key part of their research, they also acknowledge the importance of the context of discovery, which involves creative insight possibly leading to new knowledge. This discovery component of MMR often, but not always, comes from the emergent themes associated with QUAL data analysis.

The sixth characteristic endorsed by many writing in MMR is *a focus on the research question (or research problem) in determining the methods employed within any given study* (e.g., Bryman, 2006; Johnson & Onwuegbuzie, 2004; Niglas, 2010; Tashakkori & Teddlie, 1998). This *centrality of the research question* was initially intended to move researchers (particularly novices) beyond intractable philosophical issues (e.g., epistemological, ontological) associated with the paradigms debate and toward the selection of methods that were best suited to investigate phenomena of interest to them.

Much has been written about the starting point for research in the past decade; that is, do researchers start with a worldview or conceptual problem, a general purpose for conducting research, a research question, or some combination thereof? Newman et al. (2003) have argued convincingly that during the past four decades, the research purpose has gained in importance relative to the research question. We maintain, however, that once researchers have decided what they are interested in studying (e.g., what motivates the study, purpose, personal/political agenda), the specifics of their research questions will determine the choice of the best tools to use, which may be QUAL, QUAN, or mixed.

The seventh characteristic of contemporary MMR is a *set of basic "signature" research designs and analytical processes,*

which are commonly agreed upon, although they go by different names and diagrammatic illustrations. For example, we defined *parallel mixed designs* (Teddlie & Tashakkori, 2009) as

> a family of MM designs in which mixing occurs in an independent manner either simultaneously or with some time lapse. The QUAL and QUAN *strands* are planned and implemented in order to answer related aspects of the same questions. (p. 341, italics in original)

These designs have also been called concurrent, simultaneous, and triangulation designs, but there is much commonality across their definitions.

We call these design and analysis processes "signature" terms because they are unique to MMR and help set that approach apart from QUAL and QUAN research. Other signature design and analysis terms include sequential mixed designs, conversion mixed designs, quantitizing, qualitizing, and inherently mixed data analysis.

While there is general agreement about the existence of these unique MMR design and analytical processes, there is considerable disagreement about terminology and definitions, which increase as more complex typologies are generated. For example, many believe that a complete typology of MMR designs is impossible due to the emergent nature of the QUAL component of the research and the ability of MMR designs to mutate, while others seek agreement on a basic set of designs for the sake of simplicity and pedagogy. This disagreement is another manifestation of the tension between those who want MMR to become more systematic and organized (e.g., Tashakkori, 2009) and those who believe we are not ready for consensus (e.g., as noted in Leech, 2010).

The eighth contemporary characteristic of MMR is *a tendency toward balance and compromise that is implicit within the "third methodological community."* MMR is based on rejecting the either-or of the incompatibility thesis; therefore, we as a community are inclined toward generating a balance between the excesses exhibited by scholars at either end of the methodological spectrum, while forging a unique MMR identity. In their survey of Western thinking, Johnson and Gray (2010) similarly depict balance and compromise as one of the core principles of MMR, tracing that characteristic back to several philosophers.

In a similar vein, Denzin (2008) recapitulated three of Guba's (1990) themes regarding paradigms as follows:

- "There needs to be decline in confrontationalism by alternative paradigm proponents"

- "Paths for fruitful dialog between and across paradigms need to be explored"

- "The three main interpretive communities . . . must learn how to cooperate and work with one another." (p. 322)

We believe that most mixed methods researchers are in agreement with these themes, which call for compromise in dialogues among the three methodological communities.

The ninth characteristic of MMR is *a reliance on visual representations (e.g., figures, diagrams) and a common notational system.* MMR designs, data collection procedures, and analytical techniques lend themselves to visual representations, which can simplify the complex interrelationships among elements inherent in those processes (e.g., Creswell & Plano Clark, 2007; Dickinson, 2010 [this volume]; Ivankova, Creswell, & Stick, 2006; Maxwell & Loomis, 2003; Niglas, 2010; Onwuegbuzie & Combs, 2010 [this volume]; Tashakkori & Teddlie, 2003c; Teddlie & Tashakkori, 2009). QUAN methodologists sometimes graph experimental designs (e.g., Cook & Campbell, 1979), but MMR seems particularly prone to this form of communication. An important characteristic of these diagrams and figures is their ability to incorporate more dimensions as the processes they describe evolve.

Adding to these graphic communication devices, MMR has a common notation system that was developed early on (Morse, 1991, 2003) and continues to expand (e.g., Morse, 2010 [this volume]). This notation system has allowed practitioners of mixed methods to communicate in a convenient, shorthand manner.

◆ Issues and Challenges of Contemporary Mixed Methods Research

While there is some general agreement on the characteristics summarized in the previous section, there is ongoing debate about a number of important issues and controversies in MMR, which are discussed throughout the *Handbook*. Table 1.1 lists nine of these issues, which are elaborated on in this chapter and Chapter 31. In this chapter, the focus is on the general description and current status of each issue, in addition to considerations of why the topic is important to the field. The emphasis in the last chapter is on recent developments related to some of these issues, focusing on contributions from this *Handbook* and other current sources.

Like many typologies in an evolving field, the issues in Table 1.1 are neither exhaustive nor mutually exclusive: We could discuss more topics (and do in Chapter 31), and there are obvious overlaps across some of the areas. Nevertheless, we offer these particular issues as avenues for furthering the conversation about mixed methods and encourage readers to develop their own sets of issues as they read this volume

Five of the issues in Table 1.1 were also discussed in the first edition of the *Handbook* and are explored further in this edition (i.e., conceptual issues, language, design, inference quality, and practical issues in MMR applications). Four other issues added to this edition of the *Handbook* have either emerged since the publication of the first edition or were not

Table 1.1 Nine Important Issues or Controversies in Contemporary Mixed Methods Research

Issues	Continued from first edition/ New to this volume
Conceptual stances in mixed methods research (MMR)	Continuation of paradigmatic foundations theme
The conceptual/methodological/methods interface in MMR	New
The research question or research problem in MMR	New
The language of MMR	Continuation of nomenclature and basic definitions theme
Design issues in MMR	Continuation
Analysis issues in MMR	New
Issues in drawing inferences in MMR	Continuation
Practical issues in the applications of MMR (e.g., pedagogy, collaboration, and other models, funding)	Continuation of logistics of MMR theme
Cross-disciplinary and cross-cultural applications of MMR	New

as important 7 years ago. For example, analysis issues have become more important over time: They were emphasized in only one chapter of the first edition, whereas five chapters in the second edition address these topics.

CONCEPTUAL STANCES IN MIXED METHODS RESEARCH

Issues related to conceptual stances in MMR evolved from what we labeled the "Paradigmatic Foundations of Mixed Methods Research" in the first *Handbook*. This change in title reflects a transformation in MMR thought away from paradigms as monolithic interlocking sets of philosophical assumptions and toward a more practical orientation that emphasizes individual components of philosophy and theory as guiding research activities. This change emerged from critiques of what Morgan (2007) called the *metaphysical paradigm* (e.g., Guba & Lincoln, 1994, 2005; Lincoln & Guba, 1985), which is described later in this chapter.

The following section first presents information on the purist stance and how its underlying metaphysical paradigm has been deconstructed. Then, it defines and updates recent information regarding six other conceptual stances, which practitioners of mixed methods have employed in their research. Because these conceptual stances have been presented in detail elsewhere (Greene, 2007; Teddlie & Tashakkori, 2003), we focus on contemporary developments in this discussion.

The Purist Stance and Deconstruction of the Metaphysical Paradigm

The purist stance, described initially by Rossman and Wilson (1985), states that paradigms (e.g., constructivism, postpositivism) play the leading role in determining how research studies are conducted. Incommensurability of paradigms is assumed under this stance; research must be conducted within the guidelines established by constructivism, postpositivism, or some other monolithic paradigm. According to the purist stance, MMR as described throughout this volume is not possible because mixing methods is allowed only within a given paradigm (e.g., Greene, 2007).

An important development since the last edition of the *Handbook* has been a detailed critique of the concept of *paradigm* as used by purists, who link assumptions (e.g., epistemology, ontology) of their chosen paradigm with methodological traditions (QUAL, QUAN). While rejection of the incompatibility thesis has been a part of the mixed methods literature going back to Howe (1988), an explicit, nuanced rationale for this rejection has been more forthcoming only recently. This rejection is based on criticism of the interlinking of heterogeneous assumptions under the umbrella of what constitutes a paradigm (e.g., Biesta, 2010 [this volume]; Greene, 2007; Morgan, 2007). For example, Biesta (2010) refers to "clusters" of assumptions in his critique of paradigms, while Greene and Hall (2010 [this volume]) reiterate Biesta's conclusion that theorists should focus on individual philosophical assumptions rather than paradigm "packages."

Morgan (2007, pp. 50–54) presented the most explicit deconstruction of the term *paradigm* in the MMR literature, positing four alternative (and non-mutually exclusive) interpretations:

• paradigms as worldviews (ways of perceiving and experiencing the world)

• paradigms as epistemological stances, which Morgan called the metaphysical paradigm, which in his analysis is composed of the tripartite linkage of ontology, epistemology, and methodology

• paradigms as model examples (i.e., exemplars demonstrating how research is conducted in a field of study)

- paradigms as "shared beliefs among a community of researchers" (Morgan, 2007, p. 53) about the nature of questions, the methods of study, and so forth.

Morgan further argued that now is the time to move away from what he called the "exhausted" concept of the metaphysical paradigm to paradigms as shared beliefs in a research community. He argued that there were conceptual problems with the former position (e.g., a *strong* stand on incommensurability) and that the latter position is a more accurate interpretation of Kuhn's (1970) use of the term. Morgan's focus on shared beliefs in a research field has contributed to an increasing emphasis on the "community of scholars" perspective (e.g., Creswell, 2010; Tashakkori & Creswell, 2008), a position that has been reinforced by Denscombe's (2008) discussion of the nature that such a community might take. Other details regarding Morgan's pragmatic approach to methodology in the social sciences are found in Box 1.1.

B O X 1 . 1

Morgan's Pragmatic Approach to Methodology in the Social Sciences

Morgan (2007) substitutes what he calls the *pragmatic approach* for the metaphysical paradigm as a new guiding approach to methodology in the social sciences. This pragmatic approach focuses on "methodology as an area that connects issues at the abstract level of epistemology and the mechanical level of actual methods" (p. 68). Thus, he places methodology at the center of his pragmatic approach diagramming it as the link between epistemology and methods: epistemology↔methodology↔methods (p. 69).

Furthermore, Morgan (2007) proposed an organizational framework for understanding his "pragmatic approach to social science methodology" (p. 73). This framework refers to key "pragmatic" concepts such as *abduction, intersubjectivity,* and *transferability,* which supersede the QUAL/QUAN dichotomies of induction/deduction, subjectivity/objectivity, and context/generality. Further development of these pragmatic concepts "creates a range of new opportunities for thinking about classic methodological issues in the social sciences" (p. 72).

Review of Conceptual Stances Associated with Mixed Methods Research

Each of the remaining six conceptual stances from Table 1.2 has been used (explicitly or implicitly) by groups of scholars who are practicing MMR. While the term paradigm is used in the names of some of the conceptual stances described in this section, we do not use this term in the sense of the metaphysical paradigm but rather as "shared beliefs in a research field," which "usually describes smaller research groups" (Morgan, 2007, p. 51).

The *a-paradigmatic stance* states that, for many studies conducted within real world settings especially in applied fields, paradigms or conceptual stances are unimportant to practice (e.g., Teddlie & Tashakkori, 2003). Patton (2002) expressed this stance as follows: "in real-world practice, methods can be separated from the epistemology out of which they emerged" (p. 136; quote was boldface in original).

Greene (2007) concluded from her observations in the field that much of MMR and evaluation is implemented within the frameworks of either the a-paradigmatic or purist stances. Because these two stances are

almost polar opposites, a schism exists among practitioners of MMR on the importance of paradigms (or conceptual stances, to use the language employed in this section) in terms of how research is practiced in real world settings. This schism exists between individuals who might be called methods oriented as opposed to those who are conceptually oriented. Leech (2010) states that her interview with one of the early developers of MMR (Creswell) indicated that he was concerned about the growing gulf or divide between these "methodological types" and "philosopher types."

The *substantive theory stance* was discussed earlier in this chapter in the "Overview of Part I of the Handbook." Both Greene (2007) and Creswell (2010) refer to this as a position in which theoretical orientations (e.g., critical race theory, attribution theory) relevant to the research study being conducted are more important than philosophical paradigms.

Researchers who subscribe to the *complementary strengths stance* believe that MMR is possible but that the different methods must be kept as separate as feasible so that the strength of each paradigmatic position (e.g., constructivism, postpositivism) can be realized (e.g., Brewer & Hunter, 2006; Morse, 2003). Morse (2010) presents an extension of this position, which is also described later in this chapter as it relates to design issues.

Some scholars believe that *multiple paradigms* may serve as the foundation for MMR. For instance, Creswell, Plano Clark, Gutmann, and Hanson (2003) presented six advanced mixed methods designs and then argued that a single paradigm does not apply to all the designs. Creswell and his colleagues gave several examples: postpositivism might be the best paradigm for a sequential design predominantly using quantitative methods; interpretivism might be the best paradigm for a sequential design that is predominantly qualitative; and so forth.

The *dialectic stance* assumes that all paradigms have something to offer and that the use of multiple paradigms in a single study contributes to greater understanding of the phenomenon under investigation (e.g., Greene & Caracelli, 2003). Researchers employing this stance think dialectically, which involves consideration of opposing viewpoints and interaction with the "tensions" caused by their juxtaposition. Greene (2007) believes that "important paradigm differences should be respectfully and intentionally used together . . . to achieve dialectical discovery of enhanced, reframed, or new understandings" (p. 69). For example, Greene and Hall (2010) present a hypothetical investigator (Michelle), whose mental model is a blend of constructivist epistemology and feminist ideology.

The *single paradigm stance* (Teddlie & Tashakkori, 2003) was initially formulated to provide a philosophical underpinning for MMR in the same manner that constructivism did for QUAL methods and postpositivism did for QUAN methods. Greene (2007) refined this position and renamed it the "alternative paradigm stance," which she described as one that "welcomes or even requires a mix of methods" and was "not troubled by issues of incommensurable philosophical assumptions" (p. 82).

Candidates for the alternative paradigm currently include *pragmatism* (e.g., Biesta, 2010; Greene & Hall, 2010; Johnson & Onwuegbuzie, 2004), *critical realism* (Maxwell & Mittapalli, 2010 [this volume]), and the *transformative paradigm* (Mertens, 2007; Mertens et al., 2010). Although pragmatism is the most popular alternative paradigm for many practitioners of MMR, there are several versions of it, ranging from Johnson and Onwuegbuzie's (2004) synthesis, which included more than 20 general characteristics, to Biesta's (2010) depiction of Deweyan pragmatism as what we might call an "*un*paradigm":

Pragmatism should not be understood as a philosophical position among others, but rather as a set of philosophical tools that can be used to address problems— not in the least problems created by other philosophical approaches and

positions. One of the central ideas in pragmatism is that engagement in philosophical activity should be done in order to address problems, not to build systems. **(p. 97)**

Chapter 31 presents further details on these alternative conceptual stances drawing from various chapters in this volume.

THE CONCEPTUAL/ METHODOLOGICAL/ METHODS INTERFACE IN MMR

There are many differences among practitioners of mixed methods, but perhaps the most basic one is between those who are conceptually oriented (represented by Circle 1 in Figure 1.1) and those who are methods oriented (represented by Circle 2). Johnson et al. (2007) and Tashakkori (2006) have referred to this distinction as that between a "top-down" approach, in which research is driven by the conceptual or philosophical orientation of the researcher, and a "bottom-up" approach, in which research questions and methods related to those questions drive the research process.

While many conceptual and methods issues can be addressed separately, we believe that they are linked in a number of important ways, which we portray as the overlap or interface between Circles 1 and 2 in Figure 1.1. We call this overlap the "conceptual/methodological/methods interface in MMR" and put it forward as an important new issue that has emerged explicitly since the publication of the first *Handbook* in 2003.

We defined the *methodology of mixed research* earlier in this chapter as the broad inquiry logic that guides the selection of specific methods (represented by Circle 2) and which is informed by conceptual positions common to mixed methods practitioners (represented by Circle 1). We propose that the methodology of mixed research is the overlap or interface that links conceptual issues (Circle 1) and issues of methods (Circle 2) in MMR. In other words, the *methodology of mixed research* can be characterized as the mediator between conceptual and methods issues within the field, or as the point of integration between the two.[10]

Our characterization of the methodology of mixed research as the mediator or point of integration between conceptual and methods issues highlights the importance of delineating the basic principles of that methodology. What are the methodological principles that bind practitioners of MMR together regardless of differences on other issues? What are the methodological principles of MMR that set us apart as a community of scholars? At this point in the development of MMR, we believe that at least two methodological principles set it apart from other approaches, both of which were described earlier as general characteristics of MMR.

1. *Rejection of the either-or at all levels of the research process,* which leads to methodological eclecticism (i.e., the researcher as a connoisseur of methods). Practitioners of mixed methods are constantly looking for other methods to explore a research problem or answer a research question through a synergistic process that Sammons (2010 [this volume]) refers to as *mutual illumination.* We believe that MMR in the future will feature a more exotic mix of methods as researchers become more comfortable with crossing traditional methodological boundaries in answering research questions or furthering our knowledge regarding a particular research problem. Mixed methods researchers are "shamelessly eclectic" as described by Rossman and Wilson (1994), and the future of the field should feature increasingly interesting mixtures of methods (e.g., mixing geographical information systems and qualitative software; Fielding & Cisneros-Puebla, 2009). Several authors in this volume describe MMR that integrates more advanced techniques from

the QUAL and QUAN approaches, inherently mixed techniques (Teddlie & Tashakkori, 2009), and other methods unique to MMR (e.g., Bazeley; Bergman; Hesse-Biber; and Newman & Ramlo, all in this volume).

2. *Subscription to the iterative, cyclical approach to research*. Fully integrated MMR mixes top-down deductive and bottom-up inductive processes in the same study, using both confirmatory and exploratory research questions in a search for relationships between entities, the processes that underlie these relationships, and the context of these occurrences. It involves as many diverse data collection and analysis procedures as the researchers think appropriate and results in thoroughly integrated findings and inferences. These inductively and deductively based findings and inferences then generate another cycle of research as the phenomenon under study is explored at deeper levels of understanding. All truly mixed research studies go through this full cycle at least once, regardless of the initial starting point.

We believe that other methodological principles of mixed research will emerge as the field progresses and that a crucial mission for the MMR community is to discover or generate these principles over the next several years. In putting together the *Handbook,* we asked ourselves a series of questions about these methodological principles of, or frameworks for, mixed research, including the following:

- What are the methodological principles or frameworks for *research design* that distinguishes MMR from the traditional QUAL or QUAN approaches? (see Chapter 13 by Nastasi, Hitchcock, & Brown for some answers to this question)
- What are the methodological principles or frameworks for *sampling* that distinguish MMR from the traditional QUAL or QUAN approaches? (see Chapter 15 by Collins for some answers to this question)
- What are the methodological principles or frameworks for *data analysis* that distinguish MMR from the traditional QUAL or QUAN approaches? (see Chapter 17 by Onwuegbuzie and Combs for some answers to this question)
- What are the methodological principles or frameworks for *determining the quality of inferences* that distinguishes MMR from the traditional QUAL or QUAN approaches? (see Chapter 21 by O'Cathain for some answers to this question)

We realize that these are difficult questions that are confounded by the fact that there are a number of strong voices in the field and that diversity of opinion has always been a trademark of MMR. Nevertheless, we also believe that our collective efforts in this *Handbook* mark the beginning of the delineation of methodological principles for mixed research.

THE RESEARCH QUESTION OR RESEARCH PROBLEM IN MIXED METHODS RESEARCH

While the methodological principles discussed in the previous section guide the general conduct of studies employing MMR, the research question (or research problem) determines the specific methods (QUAN, QUAL, or MMR) used within any given study. The following section briefly summarizes recent dialogue concerning the role of the research question (or problem) in MMR.

We initially referred to the "dictatorship of the research question" over a decade ago (Tashakkori & Teddlie, 1998) in an effort to bring the importance of the research question to the center of the ongoing

discourse and to move researchers beyond the paradigm debate. Since then, much has been written about the importance and the attributes of MMR questions (Creswell & Plano Clark, 2007), the importance of purpose and political agenda in MMR (Mertens, 2007; Newman et al., 2003), and the necessity of correspondence between these elements and the research design, data analysis, and inferences (Tashakkori & Teddlie, 2008).

Currently, there seems to be a pervasive acknowledgment that a mixed methods project must start with a research question (or a set of questions) that drives all later stages/components of the project (even though it might get modified as the research proceeds). Consequently, the crucial question becomes: What shape should the mixed methods research question take? We have always asserted that a *mixed methods question* is one that clearly calls for a *mixed methods study*. In other words, we have favored an overarching question that potentially requires a structured quantitative approach *and* an emergent and holistic qualitative type of approach. A consequence of such a question is that it may be broken into subquestions, each requiring a different (QUAL or QUAN) approach to answer.

Such an umbrella question may lead the researcher to any one of the families of mixed designs (parallel, sequential, conversion, or a combination of these three families, as we discuss later). In some emergent sequential studies, the questions of a later phase develop as a reaction to the inferences of the previous one. In these designs, the new components are added to the initial question, forming an emergent umbrella question that incorporates all aspects of the events or behaviors under study. This is a necessary augmentation, making it possible to make integrated, meta-inferences as answers to these revised umbrella questions.

Some discussions of research questions (e.g., Creswell & Plano Clark, 2007) in mixed methods have focused on questions about the nature of integration (i.e., how do the findings of the two strands relate to each other?). Although these questions are essential, and should be asked during the course of a mixed methods study, we do not consider them research questions. Our rationale for this assertion is that researchers do not conduct research with the purpose of finding out if components of a study agree or disagree with, or complement, each other (unless the study's main problem is to solve a methodological problem by comparing the QUAL and QUAN approaches).

A variety of issues remain to be fully explored and discussed in mixed methods community:

- the shape/format of the questions (overarching, inquiring about the nature of mixing, and so forth)

- general attributes of MMR questions (emergent, preplanned, etic, emic, exploratory, explanatory, understanding, etc.)

- components of MMR questions (one overarching question, two separate questions, other)

- functional utility of asking and answering MMR questions (i.e., the stated need for using mixed methods), and

- consequences of asking and answering MMR questions (e.g., call for social-political change)

We have included a chapter (Plano Clark & Badiee, Chapter 12) on this issue in this *Handbook* and will re-examine some of the controversies again in Chapter 31.

THE LANGUAGE OF MIXED METHODS RESEARCH

The language of MMR is a broadly defined term that we labeled "nomenclature

and basic definitions" in the first edition of the *Handbook*. Language issues in MMR include both the names and definitions of the most important concepts in the field. These issues have become progressively more complex as the number of terms has increased, and the variations (often subtle) of definitions associated with those terms have multiplied. Language is very important in an emergent field such as MMR because the words we use to define the field ultimately shape how we make sense of it (e.g., Creswell, 2010). We are now at the point of needing greater precision in our construction of the language of MMR.

The following section is divided into two areas: (1) issues in creating a new language for MMR and (2) issues in creating a common language across methodological approaches (QUAN, QUAL, MMR). Taken together, these two subsections address a basic question: Should we create a new language for MMR, should we be more interested in creating a common language across methodological approaches, or should our approach be a combination of the two? We have seen evidence for both approaches over the past few years (unique MMR language; common language across the three approaches) which we detail throughout this section.

Issues in Creating a New Language for MMR

Many practitioners of MMR believe we need a language unique to the field, one that would define and describe those concepts that differentiate it from QUAL or QUAN research. For instance, as the field has developed, several authors have labored to identify and define exactly what mixed methods research is (e.g., Creswell & Plano Clark, 2007; Greene, 2007, 2008; Johnson et al., 2007; Tashakkori & Teddlie, 1998, 2003a). There has been continued debate over what the field should be called, with

variants including, but certainly not limited to: multimethod research (a historical term not used much now), multiple methods, mixed methods, mixed methodology, mixed research, integrated or integrative research, blended research, and so forth.

Fortunately, there appears to be some consensus around *mixed methods research* as the de facto term due to common usage (e.g., the name of this *Handbook* and of the leading journal in the field). We suspect that this term will endure because it now has the trappings of a brand name, widely disseminated and commonly used throughout the social and behavioral sciences.

As for the definition of MMR, Johnson et al. (2007) presented 19 alternative meanings from leaders in the field, which varied considerably in terms of specificity and content. Their constant comparative analysis of these definitions resulted in five themes, which they then incorporated into a composite definition:

> 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 broad purposes of breadth and depth of understanding and corroboration. (Johnson et al., 2007, p. 123)

While a reader may disagree with some aspects of this definition (e.g., it is too generic or does not include a component of interest to the reader), it is difficult to criticize the process that Johnson and his colleagues employed to generate it. This systematic approach for defining terms with multiple meaning in MMR is a valuable one, which we discuss again later in this chapter.

The first step in creating a vocabulary for MMR is to identify the terms to include in it. It appears that there are at

least three potential sources for a vocabulary of MMR:

• Terms that are in widespread use throughout the literature, such as the names for the signature design and analytical processes (e.g., sequential designs, quantizing). Some of these mixed methods processes have multiple names and definitions, thereby requiring procedures such as that employed by Johnson et al. (2007) to generate composite terms and definitions.

• Blended or amalgamated terms describing MMR concepts that are a combination of QUAL and QUAN terminology, such as *inference transferability,* a term that subsumes the QUAN terms external validity and generalizability, plus the QUAL term transferability (e.g., Tashakkori & Teddlie, 1998). Such MMR blended terms emerge as typologies are

generated that combine elements of the QUAN and QUAL research processes.

• Terms that describe particular research processes indigenous or unique to MMR, such as *fused data analysis* (Bazeley, 2003) or *inherently mixed data analysis* (Teddlie & Tashakkori, 2009). These terms are used to identify MMR processes that are discovered or generated by practitioners as they employ mixed methods in their research.

Box 1.2 presents a partial list of unique terms related to mixed methods data analysis that have emerged since the 1990s. The emergence of new analytical processes constitutes one of the most creative areas in MMR and often comes from researchers working on practical solutions for answering their research questions using available QUAL and QUAN data.

BOX 1.2

Partial List of Data Analysis Terms Indigenous to Mixed Methods Research

A partial list of MMR data analysis terms includes:

- crossover track analysis
- data conversion or transformation
- data importation
- fully integrated mixed data analysis
- fused data analysis
- inherently mixed data analysis
- integrated data display
- integrated data reduction
- iterative sequential mixed analysis
- morphed data analysis
- multilevel mixed data analysis
- narrative profile formation
- parallel mixed data analysis
- parallel track analysis
- quantitizing
- qualitizing
- single track analysis
- sequential mixed data analysis
- typology development
- warranted assertion analysis

The vocabulary of MMR will constantly expand as additional blended and indigenous terms are generated. Some terms will

be proposed and defined, but then discarded due to lack of common usage or conceptual clarity. The term *multimethod,*

for instance, has been largely discarded in MMR because it connotes a limited type of mixing of methods (i.e., keeping the QUAL and QUAN components largely separated until the end of the study), which has been superseded by approaches that emphasize the integration of methods across the entire research process.

Other terms will survive because they find common usage and there is general agreement about what they mean. For example, the term *iterative sequential mixed analysis* has been used (e.g., Teddlie & Tashakkori, 2009) to describe the analysis of data from a sequential study with more than two phases (e.g., QUAL→QUAN→QUAL). Examples of iterative sequential mixed analysis are found throughout the literature (e.g., Kumagai, Bliss, Daniels, & Carroll, 2004; Tolman & Szalacha, 1999) and the concept has been applied specifically to research conducted over the Internet (Teddlie, Tashakkori, & Johnson, 2008). The term iterative sequential mixed analysis will most likely become a part of the lexicon of MMR, or another more inclusive term will evolve that describes the types of analyses associated with complex sequential mixed designs.

Glossaries of MMR terms have begun appearing (e.g., Morse & Niehaus, 2010; Tashakkori & Teddlie, 2003a; Teddlie & Tashakkori, 2009). The compilation of these glossaries has revealed a problem that MMR has faced since its emergence as a separate methodological approach: inconsistency in terminology and definitions (e.g., Bryman, 2008). These inconsistencies have included (1) having a number of different definitions for the same term and (2) having a number of different names for the same concept. For example, we included a glossary in the first edition of the *Handbook* with some 150 terms, many of which had multiple definitions (e.g., mixed methods had four different meanings) indicating that different authors thought the term was important, yet disagreed as to its exact meaning.

As noted in the introduction to this section, we need greater precision and consistency in the language of MMR, which we as a community of scholars are currently constructing. While such precision and consistency entails hard work, such as that expended by Johnson and his colleagues (2007) in developing their composite definition of *mixed methods research*, we believe that such work will yield great benefits for the field. One suggestion[11] for accomplishing this is the generation of a dictionary of MMR terms similar to that developed for qualitative inquiry by Schwandt (1997). Such a dictionary could go into detail regarding the etiology and various meanings associated with MMR terms. Chapter 31 presents more details on this suggestion and other issues related to the further development of the language of MMR.

Generating a Common Language Across Methodological Approaches

If there are unique languages for QUAN research, QUAL research, and MMR, then researchers need to be *trilingual* to converse across methodological boundaries. Although this trilingualism may be necessary for the time being, we believe that a long-term goal of mixed methods practitioners should be to generate a language that identifies common processes across the methodological approaches. Such a language would encompass those processes that are highly similar to one another across multiple applications.

At this stage in the development of thought about this language, it is unclear how many common processes there are and the extent of their similarities. It is clear, however, that many specific methods or techniques are not subsumable (i.e., cannot be placed into a broader or more comprehensive cross-methodological category) because they have no equivalent in the other languages, or equivalents have not yet been developed. The search for terms for this common language involves looking for what Gorard (2010) calls the universal logic of all research.

The belief that some limited vocabulary of common terms is possible stems from the

rejection of either-or dualisms, which is at the heart of MMR. Practitioners of MMR replace these dualisms with continua that describe a range of options from one end of the methodological spectrum to the other. Once a set of multidimensional continua has been substituted for the dichotomy, it is possible to look for the commonality that binds each continuum (dimension, aspect) together. For example, Sandelowski, Voils, and Knafl (2009), in discussing the nature of data, concluded that "qualitative and quantitative data are not so much different kinds of data as *these data are experiences* formed into, for example, words or numbers, respectively" (p. 209, italics added). The commonality that binds the dichotomy of QUAL and QUAN data together is the "something experienced" that generated the data in the first place. We believe that as mixed methods data analysis evolves, "researchers will think of data less in terms of words or numbers and more in terms of transferable units of information that happen to be initially generated in one form or the other" (Teddlie & Tashakkori, 2009, p. 283).

Practitioners of MMR are in a unique position because their approach to research allows them to look across diverse methodological applications for the commonalities that bind similar processes together. For example, one of the distinguishing characteristics of MMR discussed earlier in this chapter is the "iterative, cyclical approach to research," which combines the inductive processes typically associated with QUAL research and the deductive processes typically associated with QUAN research. This cycle of research is a term that could be included in a common methodological language because it contains elements associated with all three approaches.

We recently (Teddlie & Tashakkori, 2009, p. 282) generated a list of common analytical processes used in both QUAL and QUAN research. These processes are cognitively interchangeable, although one uses numbers and the other employs words as data. For example, a practitioner of MMR

knows that cluster analysis employs the same modus operandi as the categorizing process of the constant comparative method: that is, maximizing between-group variation and minimizing within-group variation. Other examples include: comparing analyses from one part of a sample with analyses from another part of the sample; comparing actual results with expected results; and contrasting components of research design or elements to find differences. Recognition of these common processes is a step in the direction of developing a language that crosses methodological lines.

DESIGN ISSUES IN MIXED METHODS RESEARCH

Design typologies have long been an important feature of MMR, starting with Greene, Caracelli, and Graham (1989) writing in the field of evaluation and Morse (1991) in nursing. The reasons for the importance of MMR design typologies include their role in (1) establishing a common language for the field, (2) providing possible blueprints for researchers who want to employ MM designs, (3) legitimizing MMR by introducing designs that are clearly distinct from those in QUAN or QUAL research, and (4) providing useful tools for pedagogical purposes (i.e., having students compare and contrast alternative typologies).

In the context of these calls for developing mixed methods design typologies or prototypes, a number of frameworks have been proposed by the community of mixed methods scholars, often with both overlapping and divergent components and/or different names/labels. For example, we discussed a signature design type earlier in this chapter, which we called the *parallel mixed design* (e.g., Teddlie & Tashakkori, 2009) and which has had a number of different names over time (e.g., concurrent, simultaneous, triangulation designs). These designs have been defined similarly yet have differed on key particulars such as whether

or not the QUAL and QUAN phases of the study occurred at the same time, or with some time lapse, or both.

It is apparent that the conceptualization of mixed methods designs has undergone substantial changes over the past decade. For example, our typology of mixed designs has evolved considerably from the initial version (Tashakkori & Teddlie, 1998) up through the latest edition (Tashakkori, Brown, & Borghese, 2009; Tashakkori & Newman, 2010; Tashakkori & Teddlie, in progress). We discuss particulars of our latest framework later in this section.

Recently, some authors have contended that there is an overemphasis on research design typologies (e.g., Adamson, 2004; Bazeley, 2009), arguing that other areas (e.g., data analysis) should be stressed more. Some have suggested a need for a set number of prespecified designs, while others contend that MMR design typologies can never be exhaustive due to the iterative nature of MMR projects (i.e., new components or strands might be added during the course of a project). This is an important point; many inexperienced researchers want a design "menu" from which to select the "correct" one, similar to the menus provided in QUAN research (e.g., Shadish, Cook, & Campbell, 2002). In contrast, researchers using mixed methods are encouraged to continuously re-examine the results from one strand of a study compared to the results from another and to make changes both in the design and data collection procedures accordingly.

Although some find the lack of consensus regarding the specific number and types of designs disconcerting, others believe that this is a healthy sign of the growth of the mixed methods community. The ultimate value of these typologies lies in their ability to provide researchers with viable design options to choose from and build on (i.e., modify, expand, combine) when they are planning or implementing their MMR studies. We acknowledge the fact that this diversity makes it more difficult to teach and to learn mixed methodology. Students often

complain that there are too many design types, or too many suggestions about how to plan a mixed methods study. However, we are confident that over time, useful and common components of different frameworks will be identified and reconciled by the MMR community, especially by the same group (doctoral students and young scholars) that is currently critical of what members consider to be unnecessary complexities.

Perhaps, these differences would be made more salient if we briefly review three different frameworks for planning and implementing mixed methods designs: those of Janice Morse, Jennifer Greene, and our own. Although other perspectives are equally valuable, we chose these three because they represent the diversity of ideas underlying almost all design frameworks and demonstrate many of the ongoing issues related to MMR designs.

We discussed Morse's (1991, 2003, 2010) design typology earlier in this chapter with regard to the common notational system and the complementary strengths stance. In Morse's system, the priority of one method over the other is an important dimension predetermined before data collection starts. Each study has a theoretical or primary drive (inductive or deductive) that determines the overall purpose of the study, a core component (primary or main study), and a supplementary component (which is incomplete by itself and is regarded as complementary to the core component). Morse argues that MMR is possible, but that the QUAN and QUAL components must be kept as separate as possible so that the strengths of each paradigmatic position can be realized.

In Morse's system, there is no mixing of primary drives. This position is, of course, quite different from that generally endorsed in the contemporary field of MMR, where a more thorough mixing of methods is a given. Morse's (2010) latest version of her typology includes the "point of interface" (where the two components join in either the data analysis or narrative of the results)

and contains interesting diagrams of the relationships between the core and supplementary components of the research project, designated as left and right pathways.

Greene (2007) contends that researchers cannot divorce method from "assumptive frameworks" when designing MMR studies; therefore, she encourages mixing those frameworks in single research studies. Her designs are anchored in mixing methods for five basic purposes, which emerged from Greene et al. (1989): triangulation, complementarity, development, initiation, and expansion. Caracelli and Greene (1997) distinguished between *component designs,* in which the methods are connected or mixed only at the level of inference, and *integrated designs,* in which the methods are integrated throughout the course of the study.

Greene (2007) presented two examples of component designs (convergence, extension) and four examples of integrated designs (iteration, blending, nesting or embedding, mixing for reasons of substance or values). These six examples of MMR designs map onto the five basic purposes for mixing, with each example aligned with one or two of the original purposes. Greene (2007) concludes that designing an MMR study does *not* involve following a formula or set of prescriptions, but rather is "an artful crafting of the kind of mix that will best fulfill the intended purposes for mixing within the practical resources and contexts at hand" (p. 129).

In our approach to MMR, we have always treated design as separable from research purpose. That is not to deny the importance of purpose; obviously, if you did not have a purpose for doing a study, you would not have research questions, and you would probably not be conducting research at all. We think purpose is a complex, psycho-socio-political concept that motivates any given research project, and we believe each individual has a multiplicity of purposes for doing research, ranging from advancing his or her career to understanding complex phenomena, to improving society.

As noted above, our design typology has evolved as MMR has developed over the past decade (Tashakkori & Teddlie, 1998, 2003c; Teddlie & Tashakkori, 2009). In the latest edition of our typology (Tashakkori et al., 2009; Tashakkori & Newman, 2010; Tashakkori & Teddlie, in progress), we have made an effort to simplify it, while also incorporating as many recent developments in the field as possible. We have identified four *families* of designs in our typology, three of which are basic: parallel, sequential, and conversion. The fourth one, fully integrated, is a complex and iterative type that potentially includes combinations of the other three. These families are based on what we call "type of implementation process"; that is, how does the integration of the QUAL and QUAN strands actually occur when conducting a study.

We have subdivided each of the three basic families of designs into three variations based on the data sources: multiple samples, same/subsample, and multilevel samples/data. In the first variation, QUAL and QUAN data are collected from different individuals or are not linked. In the second variation, both data types are available for at least some individuals and are linked in one form or another (this includes the conversion of some data to another type). In the third, qualitative data are collected at one level of a social structure (e.g., parents), while quantitative data are collected at another (e.g., children), and are linked during analysis and inference.

This 3×3 combination produces nine basic design options. The fourth family of designs (fully integrated) incorporates multiple forms of these nine options, often in an iterative and emergent manner. Increasingly, MMR studies appear to be using this last design family by combining the basic configurations, often with multiple types/sources of data.

We conclude this section by re-iterating a few characteristics of the three typologies we have discussed. All three reflect coherent and internally consistent perspectives, which remain viable as they have evolved

over time, will continue to change in interesting ways related to developments in the field, and are heuristic in terms of informing MMR dissertations and other projects.

Our perspective is similar to Greene's orientation in that we distinguish between whether integration occurs at only one stage of the process (for us, the experiential stage) or throughout the study. Our latest solution to this thorny issue is the distinction between mixed and *quasi-mixed designs,* defining the latter as designs in which two types of data are collected and analyzed, but there is little or no integration of findings and *inferences* from the study. On the other hand, we differ with Morse's typology in that we do not believe in the necessity of pre-specifying a priority/dominance of QUAL or QUAN approaches because we believe that any single study is composed of multiple criteria, each conceptualized as a continuum, rather than a single dichotomy between core and supplementary components.

We should also note that although there are differences among the three typologies in terms of how they conceptualize MMR design, it is possible to select components of each and graft them on to the others. For example, in each of the 10 possible variations of design in our framework, one might make decisions about priority of QUAL or QUAN approach, if that is deemed useful in answering the research questions. For example, in the sequential family of designs with multiple samples, one might have a predominantly QUAN study with a less important QUAL strand that involves the collection of data on a different group of individuals.

One way of making sense out of the myriad of design typologies is to consider the criteria or dimensions on which designs differ (e.g., Greene, 2007; Teddlie & Tashakkori, 2009). Most theorists differentiate MMR designs on the basis of sequence (e.g., independent phases, or phases that are rooted in each other on a pre-planned or emergent manner). Some believe in the necessity of specifying the dominance or priority of a QUAL or QUAN approach, while others see little value in it. We recently identified seven criteria that are used in MMR typologies together with the design questions they address (Teddlie & Tashakkori, 2009).

We have suggested that when planning projects, researchers should consider these criteria, select those most salient to their particular study within its specific context, and then emphasize those dimensions in their selection of a specific design. For instance, if the researcher anticipates that his or her research question is best answered using primarily QUAL methods, but that QUAN methods may also meaningfully contribute to the project, then priority of approach is a salient design characteristic. If it is unclear whether the QUAL or QUAN sources will ultimately be most important in the results and inferences, which is more often the case at least in the MMR we have conducted, then priority of approach is not a salient design dimension.

ANALYSIS ISSUES IN MIXED METHODS RESEARCH

Analysis issues were not included as a major issue in the first edition of the *Handbook,* but there has been a growing awareness of their importance since then. Bazeley (2009) recently concluded that an indicator of the maturation of MMR would come when it moves from "a literature dominated by foundations and design typologies" toward a field "in which there are advances in conceptualization and breakthroughs derived from analytical techniques that support integration" (p. 206). Using that definition, MMR appears to be headed toward greater maturity. There are several trends in the literature that indicate the growing attention that is being paid to analytical issues in MMR.

The first trend involves the publication of a number of syntheses of analytical techniques in MMR, including Onwuegbuzie and Teddlie's (2003) chapter in the first

Handbook. These authors presented a framework for analyzing mixed data, which identified 12 pre-analysis considerations and a seven-stage generic MMR analysis model. This chapter was an important step in that it followed up on previous descriptions of mixed methods data analysis (e.g., Caracelli & Greene, 1993; Li, Marquart, & Zercher, 2000; Sandelowski, 2000; Tashakkori & Teddlie, 1998) and helped to generate a dialogue regarding MMR data analysis as a separate issue. Additional frameworks for mixed methods data analysis have been published recently, but they are often linked to specific design typologies (e.g., Creswell & Plano Clark, 2007; Greene, 2007; Morse & Niehaus, 2010; Teddlie & Tashakkori, 2009).

A second trend in MMR data analysis has been a dramatic increase in the identification of data analysis processes indigenous to MMR as exemplified by Box 1.2. These processes include general analytical procedures (e.g., data conversion); specific techniques within more general analytical processes (e.g., crossover track analysis within parallel mixed data analysis); and complex iterative mixed data analyses (e.g., iterative sequential data analysis, Teddlie & Tashakkori, 2009). The discovery or generation of these MMR data analysis procedures is a manifestation of the creative energy that is being expended in this area.

A third trend is the generation of new MMR analyses that borrow from or adapt existing procedures in the QUAL or QUAN traditions. There are two examples in this volume: Bergman's adaptation of QUAL and QUAN content analysis strategies in what he calls hermeneutic content analysis (Chapter 16) and Newman and Ramlo's mixed methods adaptation of Q methodology and Q factor analysis (Chapter 20).

A fourth trend involves MM researchers applying the analytical frameworks that have previously been used in either the QUAL or QUAN tradition in developing analogous techniques within the other tradition (e.g. Greene, 2007; Teddlie & Tashakkori, 2009). This requires both appropriate training in the QUAN and QUAL approaches and the ability to creatively see analogous processes from the mixed methods perspective.

The final trend is probably the most important: computerized analysis of MMR data sources and analyses (e.g., Bazeley, 2003, 2010). Bazeley (2003) has called this process *fused data analysis*, which she describes as follows:

> Software programs for statistical analysis and for qualitative data analysis can be used side-by-side for parallel or sequential analyses of mixed form data. In doing so, they offer . . . the capacity of qualitative data analysis (QDA) software to incorporate quantitative data into a qualitative analysis, and to transform qualitative coding and matrices developed from qualitative coding into a format which allows statistical analysis. . . . The "fusing" of analysis then takes the researcher beyond blending of different sources to the place where the same sources are used in different but interdependent ways in order to more fully understand the topic at hand. (p. 385)

Bazeley (2010) continues this discussion by presenting a variety of strategies in which computer software programs foster the integration of QUAL and QUAN data by either combining them or converting them.

There are several interesting questions related to analysis issues in MMR including the following:

1. Are MMR data analysis issues separate from research design issues, or are the two processes inextricably bound? What is the relationship between the design and analysis decisions that practitioners of mixed methods make as they conduct their research?

2. Can the diverse indigenous and adapted MMR data analysis procedures (e.g., those listed in Box 1.2) be incorporated within a single mixed data analysis

framework, or are the criteria that practitioners of MMR have used to create their mixed analysis typologies too divergent for a single framework? As Greene (2008) asked, is "integrated analysis . . . a mixed methods methodological area in which practice may always take the lead?" (p. 15).

3. If an inclusive framework for mixed methods data analysis is possible, what shape will it take? Onwuegbuzie and Combs (2010) have furthered the discussion by proposing a "meta-framework of mixed analysis strategies," which we discuss along with other analysis issues in Chapter 31.

ISSUES IN DRAWING INFERENCES IN MIXED METHODS RESEARCH

Scholars in both the QUAL and QUAN traditions have used the term *inference* to denote the process of making sense of the results, or the outcomes, of the research process (i.e., conclusions, constructions, etc.). We initially used the term in an attempt to differentiate three distinct components of research projects (Tashakkori & Teddlie, 1998): *data* (as an input to the process of meaning making in research), *data analysis* (as the process of applying a set of tools to summarize the data and link its components), and *inference* (as the outcome of the process of meaning making). These distinctions emerged from the need to differentiate between standards/audits for assessing quality in research: We called for distinguishing (1) data quality from (2) data analysis quality/adequacy from (3) the quality of conclusions that are made on the basis of the findings or results. (In Chapter 31, we refer to this as a systems approach to assessing the quality of research projects). Although some scholars still confuse data with results/findings or with the final outcome of research, there is growing awareness that inferences are clearly separate from the other two and must be explicitly evaluated for quality.

Aside from the research methodology literature, in cognitive psychology, the term inference has been used in discussions of inductive and deductive reasoning that results in causal and noncausal conclusions in everyday life (i.e., by "everyday pragmatists," as labeled by Biesta, 2010). For example, Sternberg (2009) suggests that "one approach to studying inductive reasoning is to examine **causal inferences**— how people make judgments about whether something causes something else" (p. 515, bold in original). He also discusses inference as a complex process of making conclusions about relationships (causal or otherwise) in everyday life: "The great puzzle of inductive reasoning is how we manage to infer useful general principles based on the huge number of observations of covariation to which we are constantly exposed" (Sternberg, 2009, p. 515). Smith and Kosslyn (2007) present a slightly different view of inference which links it to "category knowledge" in reasoning and cognition:

> Indeed, the whole point of categorizing is to allow you to draw *inferences*, namely, to allow you to derive information not explicitly present in a single member of a category but available because of knowledge of the characteristics of the group or groups to which it belongs. Once you categorize a perceived entity, many useful inferences can follow. (p. 149, italics in the original)

Our definition of inference has roots in cognitive psychology, philosophy, and research methodology. We have defined it as "a researcher's construction of the relationships among people, events, and variables as well as his or her construction of respondents' perceptions, behaviors, and feelings and how these relate to each other in a coherent and systematic manner" (Tashakkori & Teddlie, 2003c, p. 692).

Although inferences are the most important aspects or outcomes of any study, little has been written about their characteristics, the process of making them, and possible

standards for assessing their quality. An interesting and complex question to answer in MMR is: How do we make inferences on the basis of the results of QUAL and QUAN analyses of our data? This question is closely related to one that has been asked about the naïve analysis of events and behaviors. Discussing the process of inference in everyday human problem solving, Sternberg (2009) asks, "On what basis do people draw inferences? People generally use both bottom-up strategies and top-down strategies for doing so" (p. 519). Bottom-up strategies are "based on observing various instances and considering the degree of variability across instances" (p. 519). Top-down cognitive strategies, on the other hand, include "selectively searching for constancies within many variations, and selectively combining concepts and categories" (p. 519). We believe that the process of making inferences in research follows a similar model, but it is more formal and systematic. We will expand this idea in Chapter 31, when we refer to mixed methods as a *humanistic methodology.*

How do we make inferences in MMR? We have made an effort to identify possible steps in generating inferences in MMR (see Teddlie & Tashakkori, 2009, pp. 289–293). A major part of that process includes keeping one's research questions in the foreground because at the most basic level, inferences are answers to research questions. At the most abstract level, inferences are mini-theories and explanations for explaining events and behaviors. From this point of view, inferences fall on a continuum from the more specific to the more general; that is, they include conclusions that range from the meaning of a specific event, behavior, or relationship to global explanations of why events, behaviors, or relationships occur. Obviously, the former is more concrete, and the latter is more abstract. By virtue of being concrete, the former is more specific to the context in which the behaviors or events were observed, whereas the latter is much less situation specific.

Perhaps the most fundamental step in making inferences is to examine each part of a set of data analysis outcomes (results) separately and then evaluate how effectively it answers a research question/purpose set forth earlier. These results might be themes obtained from content analysis, numerical summaries of observed/measured variables, or complex outcomes of inferential statistics. In each case, one might ask: What does this mean? What does this tell me about the behavior or event under investigation? How does this answer my research (specific) question? In MMR, these initial queries are made from the results of both QUAL and QUAN data analyses, which are compared and contrasted on an ongoing basis, then integrated to create a more general answer to each specific research question. After going through this first stage of making inferences, one needs to compare and contrast the answers to different questions (actually, aspects of the same overarching mixed methods question) and to assess conceptual variations and similarities between them. This is the stage in which the more abstract/global explanations are found for the events and behaviors.

How do we know that our inferences are credible or believable, and not merely a function of our imaginations? This question has received more attention in the literature than the question regarding how to make inferences in MMR. At least three broad types of answers have been offered so far in the literature (Dellinger & Leech, 2007; Onwuegbuzie & Johnson, 2006; Tashakkori & Teddlie, 2003c). We have used social cognition as a model by focusing on the similarities between the researcher and the naïve analyst of behaviors and events in everyday life (the "everyday pragmatist"). In this model, quality of inferences is assessed simultaneously by examining (a) the process of reaching the results that they are based on (i.e., *design quality,* Tashakkori & Teddlie, 2003c) and (b) the attributes of the conclusions themselves (i.e., *interpretive rigor*). The degree of confidence that one has in a conclusion is

impacted by evaluations of these two components of the study.

The first criterion (design quality) asks if a suitable design was used and implemented adequately, if the components of the design fit together seamlessly, and if the data were analyzed in an efficacious and comprehensive manner. The second criterion (interpretive rigor) examines the degree of consistency of conclusions within the study, consistency with the state of knowledge about the phenomenon or behavior, consistency of conclusions reached by multiple interpreters of the same findings, distinctiveness of a specific (preferred) conclusion from other plausible explanations of the same results, and the degree of correspondence between the conclusions and the research questions of a mixed methods study. Consistent with this last point (correspondence with initial mixed methods questions) is the assessment of the degree to which the findings of various strands of a study are effectively integrated toward developing a more advanced understanding of the phenomenon or behavior under investigation.

A second answer to the question of how we know if our inferences are credible or believable concerns the legitimacy of the conclusions. Onwuegbuzie and Johnson's (2006) *legitimation model* searches for quality by examining the consistency within various components of the study (including the consistency between the questions, design, and inferences), adequacy of representing both an emic and an etic view, and adequacy of integrating the QUAL and QUAN components of design (e.g., sampling, analysis). The authors also add a consequential component by examining the degree to which the consumers of MMR value the meta-inferences that are obtained from the results of QUAL and QUAN findings.

This consequential element is also present in the third answer to the question of inference quality, proposed by Dellinger and Leech (2007). Their *validation framework* is heavily rooted in the idea of construct validity, which they perceive as

"encompassing all validity evidence" (Dellinger & Leech, 2007, p. 316).

In a previous section, we discussed language issues in MMR, including the development of a common language across methodological approaches. Perhaps, the term inference is being increasingly used as a common or "bridge" term within the QUAL, QUAN, and MMR literatures.[12]

PRACTICAL ISSUES IN THE APPLICATIONS OF MIXED METHODS RESEARCH

This section on practical issues in MMR evolved from what we called the "logistics of conducting mixed methods research" in the first *Handbook*, which included two issues: pedagogy and models for professional competency/collaboration. These two topics are again featured in this edition of the *Handbook*, plus other practical issues that have emerged, including the funding of MMR projects. All of these issues are discussed in Part III of the *Handbook*, which is depicted as Circle III in Figure 1.1.

Many of the practical topics discussed in Part III of the *Handbook* revolve around how a researcher practices methodological eclecticism, or how one becomes a *connoisseur of methods*. How does a researcher learn how to select and integrate the most appropriate techniques from a myriad of strategies (QUAL, QUAN, mixed) to thoroughly investigate a research question or problem of interest? The experienced practitioner of mixed methods seems to almost intuitively select the design and procedures that best fit the research question/problem under study, but how does he or she get to that point?

In the recent past (before the turn of the 21st century), there was only one answer to that question: through the process of applying research tools, which individuals had acquired from a patchwork of graduate and undergraduate coursework and prior experiences, to answer complex questions or problems that could be not be addressed

properly within the QUAN or QUAL traditions alone. Leech's (2010) description of how the early developers of MMR began to combine QUAL and QUAN components in their work describes how this sometimes happened: Researchers were often trained in traditions that emphasized numerical data collection and statistical analysis, picked up some skills in narrative data collection and thematic analysis as their careers developed (due to their interest in those topics), and then found themselves applying all that they knew about research methods in studies of complex social phenomena. In the preface to this volume, we also shared with you our own experiences and struggles in this process of learning MMR through a "bottom-up approach" to research. This process of intuitively using a variety of methods and techniques and drawing conclusions based on syntheses of the various types of evidence available is also described by Gorard (2010).

In the first *Handbook,* we described the lack of formal training in mixed methods as "the failure of pedagogy" and briefly described the handful of textbooks that covered mixed methods at that time and the even smaller number of articles that addressed pedagogical issues (e.g., Creswell, Tashakkori, Jensen, & Shapley, 2003; Tashakkori & Teddlie, 2003b). As detailed throughout this *Handbook,* there has been an explosion in the number of texts devoted to mixed research since that time, and a corresponding upsurge in the number of universities offering formal courses in mixed research as chronicled by Christ (2009, 2010 [this volume]), Earley (2007), and Niglas (2007).

Recent articles on pedagogical practice have been quite valuable, such as Earley's (2007) account of the 12-step process he used to develop a syllabus for his MMR course and Christ's (2009) description of the generation for his students of a research proposal process with eight interactive features. Nevertheless, the first generation of instructors of mixed methods courses must still face some problematic areas, including the complexity of teaching the numerous design typologies that were discussed earlier in this chapter (e.g., Earley, 2007, reported that students in his classes counted a total of 52 different design possibilities). Several of these pedagogical issues are discussed in this volume by Christ (Chapter 25), including a detailed description of how he used action research to improve his introductory and advanced mixed methods courses.

Nevertheless, pedagogy tells only part of the story regarding how a researcher becomes a *methodological connoisseur.* In the previous *Handbook,* we presented three models for what we called professional competency and collaboration:

- A single researcher develops dual competencies in both QUAL and QUAN methods to the point that he or she can conduct "solo" mixed methods investigations. This dual competency is the ultimate goal for the *connoisseur of methods* we have been discussing, but critics are skeptical that this is a realistic goal for most researchers, who do not have the training or field experiences to be competent in both QUAL and QUAN methods. We will discuss this in more detail in Chapter 31.

- The second model solved the problem of dual competency by proposing a collaborative team approach to mixed research consisting of members with competency in one of the two traditions (i.e., collaborative teams consisting of one or more qualitatively oriented researchers and one or more quantitatively oriented researchers). Such collaborative efforts are not uncommon in large-scale studies in the health sciences or in studies conducted in complex educational or evaluation settings.

- The third model calls for each team member in a mixed study to have a *minimum level of competency* in QUAL and QUAN methods, plus expertise in one or the other (e.g., Shulha & Wilson, 2003; Teddlie & Tashakkori, 2003). A problem with the second approach (teams consisting of qualitatively and quantitatively oriented

researchers) is that without minimum competency in both types of research, team members may not be able to communicate effectively because they lack a "common" methodological language (discussed earlier in this chapter). We concluded that the third model (minimum competency model) is probably prerequisite for the second one (the team approach) to actually work in practice.

Lieber and Weisner (2010 [this volume]) discuss the value of collaborative teams consisting of colleagues with different training and experiential backgrounds in terms of generating a "respectful environment" in which team members can struggle to design and carry out the best mixed research possible given the context of the study. They also describe the CHILD project, a longitudinal family and child developmental study, conducted by a team consisting of members from the fields of education, anthropology, psychology, statistics, family studies, and so forth.

Similarly one of the co-editors of this volume (Teddlie) participated in a longitudinal educational effectiveness project (Louisiana School Effectiveness Study) with a core team of 11 investigators from education, psychology, statistics, nursing, and research methods. Five of the team members were self-identified as mixed methods practitioners, while three maintained a primarily QUAN orientation, and three were primarily QUAL in orientation. These varieties of disciplinary/training backgrounds and research orientations led to lively group interchanges in which individual schools were discussed. These discussions were tape-recorded and were a primary source for six extensive mixed methods case studies, which appeared in Teddlie and Stringfield (1993).

Experiences on such mixed methods research teams can do much to create and enhance methodological connoisseurship. Researchers become more competent in various research methodologies as they work collaboratively on projects where they see others applying problem-solving skills to research issues from a methodological perspective at least slightly different from their own. For instance, the Jang, McDougall, Pollon, Herbert, and Russell (2008) study of "schools in challenging circumstances" quoted one of the graduate students involved in the study as follows:

> My participation in a mixed methods project expanded my horizons from research methodology as a debate between paradigms that dealt with "people versus numbers" and from an understanding that abstract debates between "either/or" actually, and quite compellingly, dialectically resolve into an "and." (p. 243)

This qualitatively oriented graduate researcher had originally been concerned about how she could contribute to the QUAN part of the study. She commented that her "rich" understanding of the QUAL data led her to seek a better understanding of the statistical analyses and graphic displays, which she discovered to be "full of life." This novice researcher appears to be in the beginning stages of becoming a methodological connoisseur.

Other practical issues presented in this edition of the *Handbook* include funding and writing mixed methods, both of which are discussed by Dahlberg, Wittink, and Gallo (Chapter 30). The Dahlberg et al. approach to both topics stresses practical considerations: they see their mission as providing "the reader with tangible strategies at the point where the epistemological rubber meets the road—to publication and grant funding" (p. 777, this volume). Creswell (2010) provides further information on funding opportunities for MMR. These and other practical issues are discussed further in Chapter 31.

CROSS-DISCIPLINARY AND CROSS-CULTURAL APPLICATIONS OF MIXED METHODS RESEARCH

Cross-disciplinary and cross-cultural applications of MMR were not included as a

major issue in the first edition of the *Handbook,* but the recent diffusion of mixed research throughout the human sciences and across academic communities around the world is a topic of growing interest in the field. Much of the dynamic energy within MMR comes from this expansion into other disciplines and cultures. There are several interesting trends in this cross-disciplinary and cross-cultural dispersion, which we briefly introduce in this section, including the wide variance in adoption rates of MMR that is apparent within academic discipline and specialty areas.

MMR has been rapidly expanding into all disciplines in the social and behavioral sciences over the past decade, as indicated by several studies of *incidence rates* (counts of the absolute number of MMR articles published per year) and *prevalence rates* (the proportion of research studies published in a given field that are mixed in nature). Although several incidence and prevalence rates studies have been published (e.g., Hart, Smith, Swars, & Smith, 2009), we briefly review information from two recent analyses (Alise & Teddlie, in press; Ivankova & Kawamura, 2010 [this volume]) as evidence of trends in the cross-disciplinary adoption of MMR.

Ivankova and Kawamura's Chapter 23 documents three interesting trends in the incidence rates of empirical mixed research published in several major databases from 2000 to 2008. First, there was a dramatic increase in the number of articles that were identified as "mixed methods" from only 10 in 2000 to 243 in 2008. This sharp increase was especially noticeable after 2003, when the first edition of the *Handbook* was published and the term *mixed methods* became more widely used. Second, there was a wide variance in the use of mixed methods across disciplines, with the health and medical fields accounting for 47% of the total number of mixed articles published, education accounting for 21%, and the rest of the fields accounting for the remaining 32%. Altogether mixed research studies were

published in 70 specific fields within broader disciplines, indicating the utility of MMR across a wide spectrum of academic specialty areas. Third, when looking at national origin of the first author of the articles, researchers from more than 30 countries contributed to the database, with over half of those from the United States, another 20% from the United Kingdom, and a significant number of the remainder from Canada and Australia (compared to all the other countries).

The prevalence rates study conducted by Alise and Teddlie (in press) compared the proportion of articles employing QUAL, QUAN, or mixed methods within "elite" journals in four disciplines. Education and nursing were selected to represent applied disciplines, while sociology and psychology were chosen to represent "pure" or basic disciplines using the Biglan (1973) classification system. The prevalence rates for mixed methods studies was considerably higher (16%) in the applied disciplines compared to the pure or basic disciplines (6%). The higher prevalence rates for MMR in applied fields were expected because MMR originated in areas such as nursing, education, and evaluation. The prevalence rate for QUAN studies in elite journals in psychology was 93%, with the other 7% classified as mixed.

Incidence and prevalence rates studies are crucial at this time for practitioners of mixed methods because they describe how MMR techniques are spreading across a variety of disciplines and how they are evolving as they expand into areas where other methodologies have previously dominated. A number of interesting questions emerge from information that has accumulated thus far. What can be done to encourage greater use of mixed methods in applied areas where they already used? What remaining barriers exist to their greater use? How can mixed methods be introduced into applied research fields where the QUAN or QUAL tradition is still dominant? Chapters 27 and 28, by Sammons

and by Song and her colleagues, respectively, address the last question by discussing how mixed methods have been successfully introduced into fields of study that have been dominated by the traditional QUAN approach.

How can mixed methods be introduced into "pure" or basic disciplines such as psychology, which has long been dominated by the QUAN tradition (especially experimental/quasi-experimental methods)? A promising sign for the use of MMR in psychology was the recent publication of an article in *Developmental Psychology* on mixing QUAL and QUAN research (Yoshikawa, Weisner, Kalil, & Way 2008). Yoshikawa and colleagues described research settings in development science, where mixed methods might be especially appropriate, including studies that explore causal associations and their mechanisms (for an excellent earlier review of these applications, see Waszak & Sines, 2003).

It is obvious that researchers working within specific disciplines and fields will shape MMR to fit the context within which they work. Ivankova and Kawamura (2010) provide insightful descriptions of how researchers in the fields of health and medicine, education, computer science, and social work have applied MMR within their fields. As MMR disperses throughout the human sciences, one challenge will be to ascertain if practitioners of mixed methods can develop and maintain a "core identity" (e.g., a set of commonly understood methodological principles) that cuts across disciplinary lines.

While researchers from a few countries have dominated the academic discourse, there is evidence that MMR is attracting scholars from a wide variety of national and cultural backgrounds. For example, the literature review by Ivankova and Kawamura (2010) indicated that scholars from more than 30 countries generated articles employing mixed methods between 2000 and 2008. In the past decade, the mixed methods community has enjoyed an

increasingly lively geographic and national diversity. Much writing, research reports, and lively scholarly debates have emerged from the United States, Europe, Canada, Australia, and to some extent, New Zealand and Japan. Although scholars from other parts of the world are publishing mixed methods research articles and methodological papers, the number and scope of these writings is still small. We see indications of accelerating growth in trans-cultural mixed methods studies.

One of the advantages of mixed methods has been its flexibility to use cultural knowledge and systematic/anecdotal field observations as research data/evidence in different types of research. Use of QUAL observations and cultural/linguistic knowledge in interpreting QUAN research and measurement results is not new in cultural/cognitive anthropology, cross-cultural psychology, and related disciplines (for example, see Hambleton, Merenda, & Spielberger, 2005; Waszak & Sines, 2003). However, there is a need for a systematic set of procedures that help in summarizing and presenting both the QUAL and the QUAN results (e.g., QUAL observations and field notes and QUAN questionnaires and structured data). Mixed methods provide such an impetus while also legitimizing the integration of QUAL and QUAN methods, data, and results.

Currently, the developing world is not highly visible in publications regarding or involving mixed methods. This, however, is not an indication of lack of feasibility or use of mixed methods in these countries. There are many indications that researchers are taking a bottom-up path to mixed methods in many areas of the world by creatively integrating QUAL and QUAN methods/approaches (also see our preface to this volume). An examination of cross-cultural research books (e.g., Smith, Bond, & Cagitcibasi, 2006) provides ample examples of integrating cultural knowledge, field notes, and qualitative observations/interviews in interpretation of survey results (or vice versa).

◆ Conclusions

This chapter introduced the reader to the organizational structure of the *Handbook,* which consists of three parts, devoted to conceptual issues, issues of methods and methodology, and contemporary applications of MMR. The overlaps among these three parts, were also discussed, and the methodology of mixed methods research was defined as the point of integration between the conceptual and methods levels. The concept of an overall "map" for the field of MMR was discussed, and its potential importance for the development of the field was further delineated.

Nine common core characteristics of MMR were discussed, including methodological eclecticism, paradigm pluralism, an emphasis on diversity at all levels of the research enterprise, and an iterative, cyclical approach to research. The value of having these common characteristics in terms of setting MMR apart from the two traditional approaches to research was emphasized.

Nine issues or controversies in contemporary MMR were discussed in detail because they involve topics that are debated throughout the *Handbook.* Four of these topics were presented as new issues that had emerged since the first edition of the *Handbook.* Analysis issues and cross-disciplinary/cross-cultural applications were highlighted as important topics for the future of MMR.

An overall goal for the *Handbook* was introduced: the delineation of methodological principles or frameworks for MMR. Two such principles were discussed, and the reader was informed that other chapters of the *Handbook,* especially those in Part II, would explore these principles/frameworks in more detail.

Chapters in the *Handbook* were briefly previewed so that readers could envision the breadth of the topics that are discussed in the volume.

Research Questions and Exercises

1. Consider the three general sections of the *Handbook*. How are topics within those sections different from and similar to one another? Discuss points of overlap among them.

2. Discuss the importance of developing a "map" of the field of MMR, including specific lines of inquiry. (You may want to reconsider this question after reading Chapter 2 by John Creswell.)

3. Which of the nine common characteristics presented is the most important in terms of setting MMR apart from the two traditional approaches to research? Why?

4. Which of the nine issues or controversies currently being debated in MMR do you consider the most important? Why?

5. What is meant by the terms methodological eclecticism and connoisseur of methods (or methodological connoisseur)?

6. What are two principles of mixed methodology? Describe how they set practitioners of mixed methods apart from researchers who use QUAL or QUAN methods exclusively.

7. What are some of the issues in developing a language for MMR?

8. Select two of the following topics and write a short essay comparing their importance for the future of MMR: design issues, analysis issues, issues in drawing inferences.

9. Select two of the following topics and write a brief essay comparing their importance for the future of MMR: pedagogy, collaborative teams, cross-disciplinary applications, and cross-cultural applications.

◆ Notes

1. In developing this chapter, we were informed by numerous scholars who have made significant contributions to MMR since 2003. The selection and treatment of the issues discussed in this chapter were particularly influenced by the work of Pat Bazeley, John Creswell, Jennifer Greene, Burke Johnson, David Morgan, and Tony Onwuegbuzie.

2. We cite chapters in this *Handbook* by either their chapter number (e.g., Chapter 2) or by their appropriate 2010 reference with authors' names (e.g., Creswell, 2010). Chapter numbers are used in the Overview sections and in instances where we are discussing the chapter within the context of the *Handbook*. Citations to 2010 publications are used elsewhere in the document. First citations using authors' names include a reference to this volume (e.g., Creswell (2010 [this volume]), while following references do not (e.g., Creswell, 2010). References for many of the chapters are located at the end of the document.

3. The distinction between what constitutes a paradigm or a theory is sometimes controversial, as exemplified by Mertens and her colleagues' (2010) delineation of why their conceptual orientation is a paradigm rather than a theory.

4. Guba and Lincoln (2005; also Lincoln & Guba, 2000) added axiology to their set of basic beliefs associated with paradigms although it was not included in earlier versions. They added axiology because it would "begin to help us see the embeddedness of ethics within, not external to, paradigms" (Guba & Lincoln, 2005, p. 200). Morgan (2007) excludes axiology from his portrayal of paradigms as *epistemological stances* (retaining epistemology, ontology, and methodology) because it is a "poor fit with the emphasis on the *philosophy of knowledge* that Lincoln and Guba originated" (Morgan, 2007, p. 58, italics in original).

5. See Teddlie and Tashakkori (2009, pp. 117–118) for a more detailed discussion of lines of research or inquiry including examples.

6. Denzin and Lincoln (2005, p. 4) similarly refer to QUAL researchers as bricoleurs, who use a variety of methodological practices associated with QUAL research.

7. At the time that MMR emerged, numerous researchers in the social and behavioral sciences believed that QUAN and QUAL research should not be mixed due to the link between epistemology and methodology. Lincoln (2010) has argued that the incommensurability thesis operates not at the methods level, but rather at the paradigmatic level. She further contends that she and her co-authors (e.g., Guba & Lincoln, 1981) have consistently argued for the use of mixed methods, and she presented several quotes illustrating that position. Nevertheless, other authors have linked ontology, epistemology, and methodology, as described by Morgan (2007) and elaborated on later in this chapter. We believe that the linkage of epistemological positions with methodological orientations led to the incompatibility thesis (Howe, 1988), which has been rejected by practitioners of mixed methods.

8. *Design quality* is the degree to which the investigator has used the most appropriate procedures for answering the research question(s) and implemented them effectively. It consists of *design suitability, fidelity, within-design consistency,* and *analytic adequacy* (Tashakkori & Teddlie, 2008).

9. Abductive logic is a third type of logic, which occurs when a researcher observes a surprising event and then tries to determine what might have caused it (e.g., Peirce, 1974). It is the process whereby a hypothesis is generated, so that the surprising event may be explained. Morgan (2007) included abduction as part of his pragmatic approach to methodology in the social sciences.

10. Our conceptual/methodological/methods interface is similar to the epistemology↔methodology↔methods connection that characterizes Morgan's (2007) pragmatic approach to methodology in the social sciences (refer to Box 1.1). The ultimate goal for his pragmatic approach is to generate a "properly integrated methodology for the social sciences" (p. 73). Our immediate goal for this *Handbook* is to delineate some methodological principles that integrate the conceptual and methods levels of MMR.

11. Burke Johnson influenced our thoughts with regard to the value of generating a dictionary for MMR.

12. Creswell (2010) has concluded that our use of the terms *inference* or *meta-inference*

seems to lean in the direction of QUAN research, rather than a language for MMR. We caution our readers that the way we use the term *inference* is not the same as *statistical inference*, which is used in a very specific context within QUAN data analysis. As noted in the text, our definition of inference is much broader and is based on an extensive literature with origins in cognitive psychology (social cognition), philosophy, and research methodology, including QUAL research traditions.

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