MIXED METHODS RESEARCH

Contemporary Issues in an Emerging Field

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The field of mixed methods research (MMR), which we have called the "third methodological movement," has evolved as a result of discussions about methods and paradigms in the social and behavioral sciences that have been ongoing for at least three decades. The "paradigm debate" between quantitatively oriented and qualitatively oriented researchers was based on sets of interlocking epistemological, ontological, and methodological assumptions. MMR offers a third alternative based on pragmatism, which argues that the two methodological approaches are compatible and can be fruitfully used in conjunction with one another (e.g., Howe, 1988; Tashakkori & Teddlie, 1998).

This chapter briefly presents several important issues in contemporary MMR, including a definition of MMR, theoretical and conceptual issues, issues in conducting MMR, and criticisms of the third methodological movement. We advise the reader to consider this to be a "sampler" of some of the contemporary issues relevant to MMR and, if you are interested, to continue your exploration of the field by reading some of the numerous cited references.

Definitions and Origins of Mixed Methods Research

Definition of Mixed Methods Research

As writing in the field of MMR has become more sophisticated, several authors have labored to identify and define exactly *what mixed methods research is* (e.g., Creswell, 2010; Greene, 2007, 2008; Johnson, Onwuegbuzie, & Turner, 2007; Tashakkori & Teddlie, 1998, 2003a). There is even continued debate over what the field should be called with variants including, but certainly not limited to, MMR, multimethod research, mixed methods, mixed methodology, mixed research, integrated 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 names of the leading journal in the field and of a handbook now in its second edition). We suspect that this term will endure, since it now has the trappings of a "brand name" that has been widely disseminated 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. While these meanings had varying levels of specificity, the authors of this analysis settled upon the following "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)

From our perspective, this definition works because it includes what we believe is an essential characteristic of MMR: *methodological eclecticism*, a term that has only occasionally been used (e.g., Hammersley, 1996; Yanchar & Williams, 2006). Hammersley originally described this characteristic as follows:

> What is being implied here is a form of methodological eclecticism; indeed, the *combination* of quantitative and qualitative methods is often proposed, on the ground that this promises to cancel out the respective weaknesses of each method. (Hammersley, 1996, p. 167, italics in original)

Our definition of methodological eclecticism goes beyond simply combining qualitative (QUAL) and quantitative (QUAN) methods to cancel out respective weaknesses. *Eclectic*, the root word of eclecticism, means "choosing what appears to be the best from diverse sources, systems, or styles."[3] For us, *methodological eclecticism* involves *selecting and then synergistically integrating the most appropriate techniques from a myriad of QUAL, QUAN, and mixed methods* in order to more thoroughly investigate a phenomenon of interest. A researcher employing methodological eclecticism is a *connoisseur*[4] *of methods* who knowledgeably (and often intuitively) selects the best techniques available to answer research questions that frequently evolve during the course of an investigation.[4]

Origins of Mixed Methods Research, With an Emphasis on Qualitative Methods

MMR emerged as a distinct orientation in the late 1970s from applied fields in the social and behavioral sciences, such as evaluation, nursing, and education (e.g., Greene, Caracelli, & Graham, 1989; Miles & Huberman, 1984, 1994; Morse, 1991; Patton, 1980, 1990, 2002; Reichardt & Cook, 1979; Rossman & Wilson, 1985). Its origin in the applied, rather than pure, human sciences was not coincidental, since those disciplines often require a pragmatic, wide-angle lens utilizing all data sources available to answer practical questions.

Numerous studies from this early MMR involved researchers adding a QUAL component to a study that was initially a QUAN-only project in order to make greater sense out of the numerical findings. In evaluation research, this involved adding a formative component (how or why did the program succeed or fail) to the summative component (did the program work). In the human sciences, this distinction relates to causal effects (i.e., *whether* X causes Y) as opposed to causal mechanisms (i.e., *how* did X cause Y) (e.g., Shadish, Cook, & Campbell, 2002).[5]

In our own research, we have found that information gleaned from narratives generated by participants and investigators often proves to be the most valuable source in understanding complex phenomena. For example, qualitatively oriented case studies of differentially effective schools express the complexity of evolving contextual and behavioral patterns in those institutions much more thoroughly than statistical summaries of numeric indicators (Teddlie & Stringfield, 1993). A simple way of saying this is that narratives (stories) are intrinsically more interesting (and often more enlightening) than numbers to many researchers, the participants in their studies, and their audiences. It is no coincidence that several MMR pioneers (e.g., Creswell, Miles and Huberman, Morse, Patton) have also written QUAL methods texts.

We want to unambiguously express our regard for the powerful contributions of QUAL methods in this fourth edition of *The SAGE Handbook of Qualitative Research* due to the concern that some scholars have expressed about MMR subordinating QUAL methods to a secondary role behind QUAN methods (e.g., Denzin & Lincoln, 2005; Howe, 2004). This is not how we interpret the MMR literature we have reviewed from the past 30-plus years. In fact, QUAL + quan studies emphasizing the detailed, impressionistic perceptions of human "data-gathering instruments" and their interpretations of their outcomes are among the most valuable of all the extant MMR literature.

We also believe that MMR can add an important dimension to QUAN research. There has been much discussion (e.g., Mosteller & Boruch, 2002; Shavelson & Towne, 2002) about the importance of randomized controlled trials (RCTs) in the social and behavioral sciences. While RCTs may represent the "gold standard" for the identification of causal effects, the addition of a QUAL component (e.g., case studies) to the design allows researchers to discuss causal mechanisms as well. There are several examples of this in the MMR literature, including (1) the mixed methods intervention program of research in the health sciences (Song, Sandelowski, & Happ, 2010) and (2) the group-case method (also known as experimental ethnography) in several disciplines (e.g., Teddlie, Tashakkori, & Johnson, 2008). MMR enables researchers to examine issues in those fields in ways that traditional QUAN methods cannot alone.

Some Contemporary Characteristics of Mixed Methods Research

We begin this section by acknowledging that there are others writing in the MMR field who will disagree with the inclusion of some or all of the characteristics described below, or with our interpretation of certain of those characteristics. Such is the nature of most emerging fields in academia, as new ideas are put forth and contested by those highly interested in the topic. This is especially the case with regard to MMR, whose development has been enhanced greatly by the juxtaposition of diverse perspectives. (Table 16.1 presents eight contemporary characteristics of MMR.)

We described the first contemporary characteristic of MMR in the previous section of this chapter: *methodological eclecticism*. This characteristic stems from rejection of the incompatibility (of methods) thesis, which stated that it is inappropriate to mix QUAL and QUAN methods in the same study due to epistemological differences between the paradigms that are purportedly related to them. Howe (1988) countered this point of view with his *compatibility thesis*, which contends that "combining quantitative and qualitative methods is a good thing" and "denies that such a wedding of methods is epistemologically incoherent" (p. 10). Howe proposed pragmatism as an alternative paradigm, a suggestion that has been endorsed by many others (e.g., Biesta, 2010; Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Tashakkori & Teddlie, 1998).

Table 16.1 Eight Contemporary Characteristics of Mixed Methods Research

	Description of Characteristic
1.	Methodological eclecticism
2.	Paradigm pluralism
3.	Emphasis on diversity at all levels of the research enterprise
4.	Emphasis on continua rather than a set of dichotomies
5.	Iterative, cyclical approach to research
6.	Focus on the research question (or research problem) in determining the methods employed within any given study
7.	Set of basic "signature" research designs and analytical processes
8.	Tendency toward balance and compromise that is implicit within the "third methodological community"

Methodological eclecticism not only means that we are free to combine methods, but 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"[6] and have included it as an essential part of our framework for determining the inference quality of MMR (Tashakkori & Teddlie, 2008). Furthermore, we believe that the best method for any given study in the human sciences may be purely QUAL, purely QUAN, or (in many cases) mixed.

Schulenberg (2007) presented a complex example of methodological eclecticism in a mixed methods study of the processes that occur in police decision making. Her data sources included interviews administered to individual officers, documents provided by the interviewees, QUAL data gathered from police department websites, documents obtained from provincial governments, census data, and tabulations of statistical data on the proportion of apprehended youth actually charged with crimes. The interview data gathered from police officers were originally QUAL in nature (from semistructured protocols), but were also converted into numbers (quantitized).

Schulenberg (2007) used these diverse data sources to generate five separate databases that addressed her research questions and hypotheses. She employed eight types of QUAL techniques and six types of statistical QUAN techniques including *t* tests, chi-squares, multiple regression, analysis of variance, manifest and latent content analysis, the constant comparative method, and grounded theory techniques. The *methodological eclecticism (connoisseurship)* of this criminologist/sociologist is apparent.

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. This characteristic is, of course, a function of the rejection of the incommensurability (of paradigms) thesis, which is widely accepted within the MMR community.

We believe that contemporary MMR is a kind of "big tent" in that researchers who currently use mixed methods come from a variety of philosophical orientations (e.g., pragmatism, critical theory, the dialectic stance). We believe that it is both unwise, and unnecessary, at this time to exclude individuals from the MMR community because their conceptual frameworks are different. We agree with Denzin's (2008, p. 322) 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."

While paradigm pluralism is widely endorsed by many mixed methods scholars, theoretical and conceptual dialogues related to MMR have been, and will continue to be, of great importance. Recent developments and controversies in this area are summarized later.

The third characteristic of contemporary MMR is *a celebration of diversity at all levels of the research enterprise* from the broader more conceptual dimensions to the narrower more empirical ones. This is demonstrated in methodological eclecticism and paradigm pluralism, but also extends to other issues. For example, MMR can simultaneously address a diverse range of confirmatory and exploratory questions,[7] while single approach studies often address only one or the other. Additionally, MMR provides the opportunity for an assortment of divergent views in conclusions and inferences due to the complexity of the data sources and analyses.

MMR emerged partially out of the literature on triangulation (e.g., Campbell & Fiske, 1959; Denzin, 1978; Patton, 2002) and has commonly been associated with the *convergence* of results from different sources. Nevertheless, there is a growing awareness (e.g., Erzberger & Kelle, 2003; Greene, 2007; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2008) that an equally important result of combining information from different sources is divergence or dissimilarity, which can then provide greater insight into complex aspects of the same phenomenon and/or to the design of a new study or phase for further investigation.

The fourth characteristic of contemporary MMR is *an emphasis on continua rather than a set of dichotomies*. A hallmark of MMR is its replacement of the "either-or" with continua that describe a range of options (e.g., Newman, Ridenour, Newman, & DeMarco, 2003; Patton, 1980, 1990, 2002; Ridenour

& Newman, 2008; Tashakkori & Teddlie, 2003c). For example, we have applied what we called the QUAL-MIXED-QUAN multidimensional continuum to a variety of research issues including statement of purpose, research questions, designs, sampling, data collection and analysis, and validity or inference quality (Teddlie & Tashakkori, 2009). The either-or dichotomies (e.g., explanatory or exploratory questions, statistical or thematic analyses) have been replaced with a range of options (including integrated questions and innovative methods for mixed data analysis).

The fifth characteristic of contemporary MMR *is an iterative, cyclical approach to research.* MMR is characterized by the cycle of research, which includes both deductive and inductive logic[8] in the same study (e.g., Krathwohl, 2004; Tashakkori & Teddlie, 1998). The cycle 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, while others start from observations or other data points. This cycle may be repeated iteratively as researchers seek deeper levels of a phenomenon. We believe that all research 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 or logic of justification*—the process associated with the testing of predictions, theories, and hypotheses, and
- the *context or logic of discovery*—the process associated with understanding a phenomenon in more depth, the generation of theories and hypotheses.

While several authors writing in MMR acknowledge the logic of justification as a key part of their research, they also emphasize the importance of the *context of discovery*, which involves creative insight possibly leading to new knowledge (e.g., Hesse-Biber, 2010; Johnson & Gray, 2010; Teddlie & Johnson, 2009). This discovery component of MMR often, but not always, comes from the emergent themes associated with QUAL data analysis.

We also conceptualize the cyclical nature of research as a kind of "ebb and flow" that characterizes some of the *signature MMR processes*, such as sequential research designs. More details on these signature MMR processes are presented later in this section.

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

Much has been written about the starting point for research; 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 a researcher has decided what she is interested in studying (e.g., what motivates the study, purpose, personal/political agenda, etc.), the specifics of her research questions will determine the choice of the best tools to use and how to use them. Experienced researchers are well aware of the fact that research questions undergo (often small) modifications and refocusing during the course of a study. Nevertheless, research questions generally direct the path of a research project.

MMR questions are usually broad, calling for both in-depth, emergent QUAL data *and* focused and preplanned QUAN data. These broad "umbrella" questions are often followed by more specific subquestions. In some (sequential) MMR projects, however, mixed questions emerge after the data are collected and analyzed, rather than being stated as initial "umbrella" questions. For example, a broad and emergent question may be asked and answered by collecting and analyzing QUAL data, followed by a question regarding the pervasiveness of the findings in a broader context or with regard to generaliziblity to a population. Despite the emergent (or sometimes preplanned) sequence in these MMR studies, both groups of findings must be incorporated toward broader understandings (i.e., meta-inferences).

The seventh characteristic of contemporary MMR is a *set of basic research designs and analytical processes,* most of which are agreed upon, although they go by different names and diagrammatic illustrations. For example, we refer to *parallel mixed designs* (Teddlie & Tashakkori, 2009, p. 341, italics in original) 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.

These designs have also been referred to as concurrent, simultaneous, and *triangulation designs* (Creswell & Plano Clark, 2007, p. 85), but there is much commonality across their definitions.

Earlier in this section, we referred to *signature MMR design and analysis processes,* such as sequential mixed designs or conversion procedures. We call these design and analysis processes "signature" terms because they help to define MMR in relation to QUAN or QUAL methods; that is, they are unique to MMR and help set this approach apart from the other two. These signature design and analysis processes include the following:

- *Sequential mixed designs* "are a family of MM designs in which mixing occurs across chronological phases (QUAL, QUAN) of the study; questions or procedures of one *strand* emerge from or are dependent on the previous strand; *research questions* are built upon one another and may evolve as the study unfolds" (Teddlie & Tashakkori, 2009, p. 345, italics in original).
- *Quantitizing* refers to the process of converting qualitative data to numerical codes that can be statistically analyzed (e.g., Miles & Huberman, 1994; Sandelowski, Voils, & Knafl, 2009).
- *Qualitizing*[9] refers to the process by which quantitative data are transformed into data that can be analyzed qualitatively (e.g., Tashakkori & Teddlie, 1998).

More signature designs and analytical procedures indigenous to MMR are discussed later. While there is general agreement about the existence of these unique MMR design and analytical processes, there is considerable disagreement about terminology and definitions, and these disagreements widen as more complex typologies are generated. For example, many believe that a complete typology of MMR designs is not possible 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 set number of basic designs for the sake of simplicity and pedagogy.

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 of both the QUAL and QUAN orientations, while forging a unique MMR identity. This balance is in keeping with Johnson and Onwuegbuzie's (2004) depiction of pragmatism as seeking a middle ground between philosophical dualisms and finding workable solutions for seemingly insoluble conceptual disputes.

In this context, we refer again to Denzin's (2008) paraphrase of three of Guba's (1990) themes regarding paradigms:

- "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" (Denzin, 2008, p. 322).

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

Theoretical and Conceptual Issues in Mixed Methods Research

While there is agreement on some broad characteristics of MMR, there are several ongoing dialogues regarding basic theoretical and conceptual issues within MMR. We concentrate on two: (1) issues related to the paradigms, which are also referred to by several other terms such as stances, approaches, frameworks, perspectives, mental models, and so forth and (2) issues related to the language of MMR.

Issues Related to the Use of Paradigms (or Conceptual Frameworks or Mental Models)

In this section, we first provide more details on the concept of paradigm pluralism. Then we present three alternative paradigmatic positions for MMR, followed by a discussion of some arguments against the continued focus on paradigm issues.

We presented paradigm pluralism as one of the contemporary characteristics of MMR earlier. The belief that multiple paradigms may serve as the underlying conceptual framework for MMR is a practical solution to some thorny philosophical and conceptual issues: Researchers simply use the philosophical framework that best fits their particular "intellectual odyssey."

Most MMR scholars can agree with paradigm pluralism as a starting point, but then they have to (1) consider the alternative paradigmatic positions and (2) *ascertain which of those positions is most closely related to their own perspective.* The following three paradigmatic positions[10] are the most widely accepted in contemporary MMR:

- pragmatism and its interpretations,
- frameworks associated with the axiological assumption (Mertens, 2007), and
- the dialectical stance, which involves using multiple assumptive frameworks within the same study (e.g., Greene, 2007; Greene & Caracelli, 2003).

Before examining these positions further, we need to briefly reconsider the ramifications of paradigm pluralism, which was posited in opposition to the single paradigm-single method thesis (e.g., postpositivism and QUAN methods; constructivism and QUAL methods). Denzin (2008, p. 317) considers the rejection of the single paradigm-single method thesis to be historical:

> When the field went from one to multiple epistemological paradigms, many asserted that there was incompatibility between and across paradigms, not just incompatibility between positivism and its major critic, constructivism. . . . Ironically, as this discourse evolved, the complementary strengths thesis emerged, and is now accepted by many in the mixed-methods community. Here is

where history starts to be rewritten. That is multiple paradigms can be used in the same mixed-methods inquiry . . . Thus the demise of the single theoretical and /or methodological paradigm was celebrated.

It is important to realize that Denzin's analysis emphasizes not only paradigm pluralism, but also that researchers *may use multiple frameworks in the same study*, which is supported by only one of the contemporary positions noted above (the dialectical stance). Researchers who prescribe to pragmatism or a framework based on the axiological assumption typically use only that perspective in their research.

Pragmatism and Its Interpretations

There is an affinity for pragmatism as the paradigm of choice for many mixed methodologists (e.g., Tashakkori & Teddlie, 1998). This affinity is a historical one going back to Howe's (1988) postulation of the compatibility thesis based on pragmatism. The pragmatic approach to philosophical issues is appealing to many applied scientists who utilize a kind of "everyday pragmatism" (Biesta, 2010) in their solution of research and evaluation problems.

A more *philosophically nuanced pragmatism* has emerged recently (e.g., Biesta, 2010; Greene & Hall, 2010; Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Teddlie & Tashakkori, 2009). This pragmatism asks, "Apart from the rejection of the either-or, what does pragmatism mean for MMR?" We briefly describe three recent interpretations of pragmatism (Johnson and colleagues; Biesta, 2010; Greene, 2007) that have advanced the conversation.

Johnson and colleagues have ventured into a kind of "paradigm or systems building" with regard to *philosophical pragmatism*. Johnson and Onwuegbuzie (2004) presented 21 characteristics of pragmatism in an effort to more completely delineate the tenets of this philosophy and how they relate to MMR.

Johnson et al. (2007) defined three pragmatisms: of the right, of the left, and of the center (*classical pragmatism*). Johnson (2009, p. 456) further defined *dialectical pragmatism* as a "supportive philosophy for mixed methods research" that combines classical pragmatism with Greene's (2007) dialectical approach. The cumulative contribution of Johnson and colleagues' work is that we now have a clearly articulated and detailed account of pragmatism as it relates to MMR.

In contrast, Biesta (2010, p. 97) contends that "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." Biesta emphasizes that John Dewey warned against philosophical system building. Biesta concludes that Deweyan pragmatism contributes to the dismantling of the epistemological dualism of objectivity/subjectivity:

> The major contribution of Dewey is that he engages with this discussion from a different starting point so that the either/or of objectivism and subjectivism loses its meaning. . . . This is tremendously important for the field of mixed methods research as it does away with alleged hierarchies between different approaches and rather helps to make the case that different approaches generate *different* outcomes, *different* connections between doing and undergoing, between actions and consequences, so that we always need to judge our knowledge claims pragmatically, that is in relation to the processes and procedures through which the knowledge has been generated. (Biesta, 2010, p. 113, italics in original)

Biesta concludes that philosophical pragmatism leads us to understand that no methodological approach is intrinsically better than another in knowledge generation. We have to evaluate the results from our research studies in terms of how good a job we did in selecting, utilizing, and integrating all the available methodological tools. Did we succeed in our efforts at *methodological eclecticism?*

Greene (2007) referred to pragmatism as the *alternative paradigm* (to the dominant traditional ones) that promotes the active mixing of methods and integration of research findings. Greene and Hall (2010) further described how thinking pragmatically affects the manner in which mixed researchers conduct their research. For Greene and Hall and others (e.g., Biesta, 2010; Johnson & Onwuegbuzie, 2004), pragmatism results in a problem-solving, action-oriented inquiry process based on a commitment to democratic values and progress.

Frameworks Associated With the Axiological Assumption

Mertens (2007) identified four basic assumptions associated with paradigms that were previously delineated by Guba and Lincoln (2005): axiological, epistemological, ontological, and methodological. Mertens, Bledsoe, Sullivan, & Wilson (2010, p. 195) further described the *axiological assumption* that "takes precedence and serves as a basis for articulating the other three belief systems because the transformative paradigm emerged from the need to be more explicit about how researchers can address issues of social justice." The axiological assumption is based on "power differences and ethical implications that derive from those differences" between marginalized and other groups (Mertens et al., p. 195).

In discussions of pragmatism, the philosophical issues that are emphasized are epistemological in nature concerning issues such as what is knowledge, how is it acquired, and the relationship between the knower and "known." On the other hand, scholars working within transformative or critical frameworks (e.g., feminism) give precedence to axiological considerations, which center on the nature of value judgments. This *axiological assumption* means that scholars working within transformative/critical frameworks have a different perspective on research methods. For these scholars, mixed methods are tools that are used in the service of value systems that are always foremost.

The Dialectic Stance or Way of Thinking

The dialectic stance assumes that all paradigms have something to offer, and that employing multiple paradigms contributes to greater understanding of phenomena under study. Pragmatism and axiologically oriented frameworks utilize one perspective exclusively, while the dialectical stance calls for the juxtaposition of multiple assumptive frameworks within the same study. Greene (2007, p. 114) expresses it thus:

> I have adopted the stance that method cannot be divorced from the inquirer's assumptions about the world and about knowledge, the inquirer's theoretical predispositions, professional experience, and so forth. . . . So when one mixes methods, one may also mix paradigmatic and mental model assumptions as well as broad features of inquiry methodology.

Greene's dialectical stance directs attention away from the so-called incommensurable attributes of paradigms and toward different and distinctive (but not inherently incompatible) attributes such as distance-closeness, outside-insider, emic and etic, particularity and generality, and so forth. Greene and Hall's (2010) dialectical stance agrees with Biesta's (2010) pragmatism in that these philosophical systems are *not* "paradigm packages" with interlocking philosophical assumptions or beliefs.

Arguments Against the Continued Focus on "Paradigms"

The term "paradigm" has played a crucial role in the development of the three methodological communities since the initial publication of Kuhn's (1962) *The Structure of Scientific Revolutions*. Recently, authors have expressed increasing doubt about the utility of the continued focus on paradigm issues in MMR. For instance, Bazeley (2009, p. 203) concluded that "Although the epistemological arguments of the 'paradigm wars' sharpened our thinking about issues related to mixed methodology, their lingering legacy has been to slow the progress of integration of methods."

Morgan (2007) deconstructed the term "paradigm" into four possible (and not mutually exclusive) positions:

- paradigms as worldviews (ways of perceiving and experiencing the world),
- paradigms as epistemological stances (which Morgan called the *metaphysical paradigm*),
- paradigms as model examples (i.e., "exemplars" demonstrating how research is conducted), and
- paradigms as shared beliefs about types of questions, methods of study (and so on) among a community of scholars or within a field of study.

Morgan argued that Guba and Lincoln (e.g., Lincoln & Guba, 1985; Guba & Lincoln, 1994, 2005) used the metaphysical paradigm to draw attention to QUAL research as an alternative to QUAN research. This metaphysical version focused on the basic assumptions or beliefs noted above, with a special emphasis on epistemological considerations, drawing essential, incommensurable differences between the QUAL and QUAN perspectives thereby leading to the paradigm wars.

Morgan further argued that now is the time to move from what he considers the outmoded concept of *metaphysical paradigms*[11] to paradigms as *shared beliefs in a research field* due to conceptual problems with the former position (e.g., a *strong* stand on incommensurability) and to the fact that the latter position is a more accurate interpretation of Kuhn's use of the term.[12] 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), which is a position that has been reinforced by Denscombe's (2008) discussion of the nature that such a community might take.

The Language of Mixed Methods Research

We previously identified the language of mixed methods as one of the major issues in MMR (Teddlie & Tashakkori, 2003). At that time, we distinguished between MMR using a *bilingual language* that combined QUAL and QUAN terms or generating a *new language* with terms unique to the field itself. Since that time, we have seen manifestations of both tendencies.

For instance, we recently (Teddlie & Tashakkori, 2009, p. 282) generated a list of common analytical processes used in both QUAL and QUAN research that are examples of a bilingual language. These processes are cognitively interchangeable, although one uses numbers and the other employs words as data. For example, a bilingual mixed methods researcher 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; comparison of 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. On the other hand, Box 16.1 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. Using mixed data analysis as an example, it appears that the language used in MMR will involve both bilingual terms and unique mixed terms (e.g., Box 16.1).

Box 16.1 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
- qualitizing
- quantitizing
- sequential mixed data analysis
- single track analysis
- typology development
- warranted assertion analysis

These terms were generated or employed by several authors, including Bazeley, 2003; Caracelli & Greene, 1993; Greene, 2007; Greene, Caracelli, & Graham, 1989; Li, Marquart, & Zercher, 2000; Onwuegbuzie & Combs, 2010; Onwuegbuzie, Johnson, & Collins, 2007; Onwuegbuzie & Teddlie, 2003; Tashakkori & Teddlie, 1998; Teddlie & Tashakkori, 2003, 2009.

Box 16.2 How Worldviews Affect MMR Praxis

There is general agreement that a researcher's worldview affects the manner in which that person conducts his or her research, yet there have been few explicit discussions of how that occurs in MMR. Several of the chapters in the recently published second edition of the *SAGE Handbook of Mixed Methods in Social & Behavioral Research* presented detailed versions of actual or hypothetical researchers and how they conducted MMR within a particular worldview (or assumptive framework or mental mode). These chapters included

- Greene and Hall (2010) described Michelle (a hypothetical researcher), who is conducting research on the interactions among middle school children as they go through their daily routines. Michelle's perspective is that of the *dialectic inquirer* who is attuned to the values underlying the multiple philosophical frameworks (constructivist epistemology, feminist ideology) that guide her research.
- Greene and Hall (2010) described Juan (another hypothetical researcher), whose perspective is that of a *pragmatic inquirer* who is studying schools that are struggling to simultaneously serve the needs of their diverse study bodies and to meet the accountability mandates of NCLB (No Child Left Behind).
- Hesse-Biber's (2010) description of research conducted within the *feminist tradition*, including studies as diverse as forestland usage in Nepal and sex work in Tijuana.
- Mertens and colleagues' (2010) description of research conducted within the *transformative paradigm tradition*, including studies on inclusive education for disabled people in New Zealand and poverty reduction in Rwanda.

Issues in Conducting Mixed Methods Research

Issues related to how to conduct MMR appear to have gained in importance relative to discussions of theoretical and conceptual issues recently. This trend is probably a reflection of the growing acceptance of MMR as a distinct methodological orientation and increased curiosity regarding the specifics of exactly how such research is conducted, disseminated, and utilized.

Chapters in the second edition of the *SAGE Handbook of Mixed Methods in Social & Behavioral Research* not only describe how to do MMR, but also illustrate how researchers' worldviews affect the manner in which they conduct their research. Box 16.2 presents information on how the different paradigmatic orientations summarized in the previous section of this chapter affect MMR praxis.

While there are several broad issues in conducting MMR (from generating research questions through making inferences from integrated data analyses), we can only discuss a couple here. We have selected research design, because there has been substantial work done in this area, and data analysis, because this is an area where considerable creative energy is currently being expended.

The Design of Mixed Methods Studies: A Diversity of Options

Design typologies have long been an important feature of MMR starting with Greene et al. (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 establishing a common language for the field, providing possible blueprints for researchers who want to employ MMR designs, legitimizing MMR by introducing designs that are clearly distinct from those in QUAN or QUAL research, and providing useful tools for pedagogical purposes.

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. While such design typologies may not be featured as extensively in future writing in the field, they will continue to be an essential element of MMR. This is partly due to the fact that many of the proposed data analysis procedures in MMR are actually design-bound; that is, they are related to a specific type (or family) of designs (e.g., sequential data analysis in sequential mixed methods designs).

While some authors argue for a set number of prespecified designs, others contend that MMR design typologies can never be exhaustive, due to the iterative nature of MMR research projects (i.e., new components or strands might be added during the course of a project). This is an important point, since many inexperienced researchers want a design "menu" from which to select the "correct" one, similar to those provided in QUAN research (e.g., Shadish et al., 2002). In contrast, researchers using mixed methods are encouraged to continuously reexamine the results from one strand of a study compared to the results from another, and make changes both in the design and data collection procedures accordingly.

Researchers seeking their own *MMR design family* have a variety of viable options in the current "marketplace" (e.g., Creswell & Plano Clark, 2007; Greene, 2007; Leech & Onwuegbuzie, 2009; Maxwell & Loomis, 2003; Morse, 1991, 2003; Teddlie & Tashakkori, 2009). Nastasi, Hitchcock, and Brown (2010) recently examined various design typologies,[13] divided them into basic and complex categories, and determined that they differed with regard to nine distinct criteria or dimensions.

While some find the lack of consensus regarding the specific number and types of designs disconcerting, we believe that this is a healthy sign and that the most useful of the typologies will survive. The ultimate value of these typologies lies in their ability to provide researchers with viable design options to choose from and build upon (i.e., modify, expand, combine) when they are planning or implementing their MMR studies. The diversity in design typologies can be best exemplified by briefly examining two points of view that are distinct and have continued to evolve since first introduced: those of Jennifer Greene and our own. Other perspectives are equally valuable, but we chose these two because they make particularly interesting contrasts.

Greene 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 that emerged from Greene et al. (1989): triangulation, complementarity, development, initiation, and expansion. Caracelli and Greene (1993) 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, p. 129) concludes that designing a 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."

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 be doing it. We think purpose is a complex, psycho-socio-political concept and we believe each individual has a multiplicity of purposes for doing research ranging from "advancing your career" to "understanding complex phenomena" to "improving society." These purposes are intertwined and often change over time.

Our design typology has evolved as MMR has developed over the past decade (Tashakkori & Teddlie, 1998, 2003c; Teddlie & Tashakkori, 2009). The base of our system is a three-stage model of the research process that evolved from Patton's (2002, p. 252) "pure and mixed strategies" for conducting research. These three stages are conceptualization (formulation of questions specific to the research study), experiential (methodological operations, data generation, analysis, and so forth), and inferential (emerging theories, explanations, inferences, and so forth). Mixed designs are those in which the QUAL and QUAN approaches are integrated across the three stages. There are (currently) four families of mixed methods designs in our typology: parallel, sequential, conversion, and fully integrated. 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. Increasingly, MMR studies seem to use a combination of the basic configurations, often leading to fully integrated designs with multiple types/sources of data.

Similar to Greene's perspective, 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*; the former was defined in the previous

paragraph, while we define the latter as designs in which two types of data are collected, but there is little or no integration of findings and *inferences* from the study.

Both of these perspectives regarding MMR designs

- reflect coherent and internally consistent perspectives,
- are currently viable as they continue to evolve in interesting ways related to changes in the field,
- are heuristic in terms of informing MMR dissertations and other projects, and
- have advanced the MMR designs literature over time (and have, themselves, evolved as a result).

In comparing our position regarding MMR design with hers, Greene (2007, p. 117) concluded,

> my own thinking about mixed methods design shares considerable intellectual space with those of Tashakkori and Teddlie, but also contains some differences. . . . There is certainly ample space in the contemporary mixed methods conversation for these complementary yet distinct sets of ideas.

Mixed Methods Data Analysis

Mixed methods data analyses are the processes whereby QUAN and QUAL data analysis strategies are combined, connected, or integrated in research studies (Teddlie & Tashakkori, 2009). Much creative energy is currently being expended on topics related to MMR data analysis, especially that involving integrated computer-generated applications (e.g., Bazeley, 2010). Bazeley (2009, p. 206) 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."

We limit our discussion of analysis issues to two topics foreshadowed in the previous section on the language of mixed methods: (1) the identification of analogous analytical processes in QUAL and QUAN research, and (2) the generation of a unique lexicon of MMR analysis procedures indigenous to the area. The analogous processes represent what Greene (2007, p. 155) called, "using aspects of the analytic framework of one methodological tradition within the analysis of data from another tradition."

In an early demonstration of this process, Miles and Huberman (1984/1994) took matrices from the QUAN tradition (e.g., contingency tables filled with numbers or percentages generated from chi-square analysis) and applied that framework to the QUAL tradition by crossing two dimensions and then completing the cells with narrative information. In one example, Miles and Huberman (1994) illustrated the implementation of a longitudinal school improvement project by using columns that represented years and rows that represented levels of intervention. Cross-case comparisons between schools demonstrated where there were differences in reform implementation between more and less successful schools.

Similarly, Onwuegbuzie (2003) applied the QUAN concept of effect sizes to generate an analogous QUAL typology including three broad categories (manifest, adjusted, and latent QUAL effect sizes). Effect sizes in QUAN research refer to the strength of the relationship between two numeric variables calculated by statistical indices. The generation of effect sizes in QUAL research is an analytical process in which the strength of the relationship between narrative variables is calculated after these variables have been quantitized.

In the future, we believe that MMR researchers will increasingly apply the analytical frameworks used in either the QUAL or QUAN tradition in developing analogous techniques within the other tradition. This requires both appropriate training in the QUAN and QUAL approaches and the ability to creatively see analogous processes from the mixed methods perspective.

Similarly, creative insight on the part of a variety of researchers has resulted in the lengthy list of data analysis terms indigenous to MMR in Box 16.1. These terms refer to general analytical processes (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 utilizing multiple computer programs. Bazeley (2003, p. 385, italics added) has called the latter process *fused data analysis*, which she describes as follows:

> Software programs . . . 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.*

Another noteworthy trend in mixed methods data analysis was discussed in the section on the third characteristic of contemporary MMR: the celebration of diversity at all levels of the research enterprise. This characteristic is exemplified in mixed methods data analysis by the growing awareness that divergence of findings and inferences across the QUAL and QUAN strands is equally as informative as convergence (or even more so), because that divergence leads researchers to more complex understandings and toward further research studies.

Critiques of Mixed Methods Research

Several criticisms of MMR have been voiced, especially as the field has become more visible since the turn of the 21st century. In this section, we briefly review some of the most salient of those criticisms.

From a historical perspective, the most common criticism of MMR is the incompatibility thesis, which stated that it is inappropriate to mix QUAL and QUAN methods in the same study due to epistemological differences between the paradigms that are purportedly related to them (e.g., Howe, 1988). This issue was addressed in the discussion regarding the first contemporary characteristic of MMR, *methodological eclecticism*, which contends that we are free to combine the best methodological tools in answering our research questions. While the philosophical justification for methodological eclecticism is important, the historical argument against the incompatibility thesis is probably more compelling: Researchers have been fruitfully combining QUAL and QUAN methods throughout the history of the social and behavioral sciences resulting in multilayered research that is distinct from either QUAL or QUAN research alone.

Criticisms of MMR from the QUAL research and postmodern communities (e.g., Denzin & Lincoln, 2005; Howe, 2004; Sale, Lohfeld, & Brazil, 2002) have involved several issues, which have in turn been addressed by the MMR community (e.g., Creswell, Shope, Plano-Clark, & Green, 2006; Teddlie et al., 2008). Perhaps the most salient of these issues is the concern that MMR subordinates QUAL methods to a secondary position to QUAN methods. As noted in the first section of this chapter, we unequivocally express our regard for the powerful contributions of QUAL methods and interpret the overwhelming majority of truly mixed research as involving a thorough integration of both methods. Fortunately, recent literature (e.g., Creswell et al., 2006; Denzin, 2008) indicates that the QUAL and MMR communities can be involved in a productive discourse respectful of diverse viewpoints and cognizant of our many points of agreement.

Valuable criticisms of MMR include logistical ones (i.e., its implementation in actual research studies), including concerns about the costs of such research and about who does the research (e.g., teams of researchers, solo investigators). We believe that the employment of QUAL, QUAN, or MMR approaches in any given study depends on the research questions that are being addressed and that many issues are best and most efficiently answered using either the QUAL-only or QUAN-only approach. MMR techniques should be used only when necessary to adequately answer the research questions, because the mixed approach is inherently more expensive than the QUAL or QUAN alone orientations. Mixed studies take longer to conduct, which is a major issue for doctoral students, as well as researchers operating under stringent timelines to complete contracted work. Researchers bidding for contracts using MMR should be especially careful to provide accurate budgets for what it would take to do the work comprehensively, especially the QUAL component, which may involve time-consuming ethnographies. MMR projects that underestimate the time and money required to complete all components of the design will likely result in "QUAL-light" research that does not deliver what was promised.

As for who does the research, there is concern that a "minimal competence model or methodological" bilingualism is "superficial, perhaps even unworkable" (Denzin, 2008, p. 322). Issues of mixed methods pedagogy are beyond the scope of this chapter, but there is an active literature developing in this area (e.g., Christ, 2009, 2010; Creswell, Tashakkori, Jensen, & Shapley, 2003; Tashakkori & Teddlie, 2003b) that includes details on current MMR courses being taught and how they have evolved over time (Christ, 2010). The collaborative approach to MMR has been described by Shulha and Wilson (2003) and successful examples of it are found in the literature (e.g., Day, Sammons, & Qu, 2008).

In our discussion of "methodological connoisseurship," we indicated that mixed methodologists knowledgeably (and often intuitively) select the best techniques available to answer research questions that may evolve during the course of a research project. The question arises: How is such experience and judgment developed across diverse methods, especially in the QUAL area? There is no simple answer to this question, but we believe that a combination of coursework and field experiences is necessary to begin the journey toward "methodological connoisseurship." The field experiences are crucial and we advocate an active mentorship between professors who are mixed methodologists and their graduate students. Preferably, this mentorship would include field experiences in research projects where the professor is the principal investigator and/or dissertations in which the student is required to conduct extensive QUAL and QUAN research to answer different parts of the research questions being investigated. We have served on several dissertation committees where students have completed successful MMR projects and have begun their journey toward becoming "methodological connoisseurs." (See Schulenburg [2007] and Ivankova, Creswell, & Stick [2007], for examples of research articles based on mixed methods dissertations.)

Another criticism of MMR concerns the quality of the writing of many articles and chapters in the field. Leech (2010) conducted interviews with early developers of the field who concluded that authors need to do a better job of (1) expressing where their research fits within the current MMR literature; (2) presenting their own definition of MMR; (3) explaining where and how the mixing of methods occurred in their research; and (4) explicitly describing their philosophical orientation. Creswell (2009) has recently presented a preliminary "map" delineating subareas of MMR that should help authors in "locating" themselves within the field. The multiple definitions of MMR presented by Johnson et al. (2007) should help authors in describing their own perspectives, while the various design typologies offer options with regard to how authors can describe the mixing of methods in their research projects. Furthermore, the explicit delineation of at least three philosophical orientations in the field (pragmatism, frameworks associated

with the axiological assumption, the dialectic stance) with other emerging alternatives (e.g., critical realism) provides authors with alternative philosophical orientations from which to choose and then make explicit in their writings.

Finally, Freshwater (2007), Greene (2007), Greene and Hall (2010), and others have expressed a concern that MMR is prematurely headed toward some "fixed" unity or consensus for social inquiry that will preclude the consideration of and respect for multiple approaches. For example, Freshwater (2007, p. 141) criticizes the "idolatry of integration and coherence," which she sees as "rife throughout nursing and the healthcare literature." This concern is akin to the apprehension that Smith and Heshusius (1986) voiced about "closing down the conversation" with regard to the quantitative-qualitative debate. We can understand this concern intellectually, since one of the characteristics of MMR is a "tendency toward balance and compromise," but we do not see MMR as becoming a static unified approach toward social inquiry that will stifle diverse viewpoints.

Perhaps our confidence that MMR leads toward a "celebration of diversity at all levels of the research enterprise" comes from our experiences in editing two volumes of the *SAGE Handbook of Mixed Methods in Social & Behavioral Research*, which have presented

- a wide variety of philosophical and conceptual models for MMR,
- an increasingly diverse set of methodological tools that can be employed in all aspects of conducting integrated research, especially those related to data analysis and the inferential process, and
- a diversity of applications of MMR across disciplinary boundaries and within specific lines of research.

Closely linked to this perspective regarding the inherent diversity of MMR is our perception of it as an extension of everyday sense making. Everyday problem solvers (naïve researchers) use multiple approaches concurrently or in sequence, examine a variety of evidence in decision making (or even in forming impressions), and question the credibility of their impressions, conclusions, and decisions. Although using a different type of data, more sophisticated methods of analysis, and more stringent standards of evidence and inference, a mixed methods researcher (the *methodological connoisseur* described earlier) follows the same general path that is characterized by a reliance on diverse sources of evidence.

Where Will We Be in 10 Years?

It is always difficult to predict the future, especially for a field that has only formally emerged in the past 15 to 20 years. The following comments are, therefore, our best guesses based on what we see as the trajectory of the field and are presented with the acknowledgment that future historic events could radically change the course of MMR.

1. There will be a gradual acceptance of pragmatism as the primary philosophical orientation associated with MMR, just as constructivism is associated with QUAL research and postpositivism with QUAN methods. Philosophical pragmatism as it relates to MMR will be defined more precisely. Other philosophical points of view will exist along with pragmatism as a basis for MMR, and this will be acceptable due to the belief of most mixed methodologists in paradigm pluralism. There will be relatively less emphasis on discussion of theoretical and conceptual issues.

2. A generic set of MMR designs will emerge over time and will be popularized in textbooks. These designs will include "signature" designs plus others that will emerge. Debates about which typology (among the half dozen or so most well-known ones) will subside as this generic set of prototypical designs is popularized. There will be relatively less emphasis on discussion of design issues in MMR.

3. Analysis issues will become more important, fueled by advances in the computer analysis of mixed methods data (e.g., Bazeley, 2009, 2010). Within MMR, data will be conceptualized "less in terms of words or numbers and more in terms of transferable units of information" (Teddlie & Tashakkori, 2009, p. 283). Mixed methodologists will develop widely accepted principles of mixed methods data analysis that will supersede the typologies that currently exist. The development of these principles of mixed methods data analysis is crucial to the continuation of MMR as a separate methodological movement.

4. MMR will continue to be adopted throughout the social and behavioral sciences. The form that it takes within any particular discipline will depend on the existing conceptual and methodological orientations within those fields. A challenge for mixed methodologists will be to develop and maintain a "core identity" (e.g., a set of commonly understood methodological principles) that cuts across disciplinary lines.

5. An alternative future is for MMR to continue to pave the way for human sciences research to be more inclusive (eclectic) and research question oriented. This will result in fewer projects being identified as purely QUAL or QUAN, and more that are simply called "research projects" (not labeled specifically as MMR). Unless mixed methodologists develop a core identity of commonly understood methodological principles, it may simply be absorbed into this eclectic blend of research methodologies.

Notes

1. We wish to express our gratitude to Norman Denzin, Yvonna Lincoln, and Harry Torrance for their very helpful comments and suggestions on earlier versions of this chapter.

2. This definition was taken from *The American Heritage Dictionary of the English Language* (1969, p. 412).

3. Denzin and Lincoln (2005, p. 4) similarly refer to QUAL researchers as *bricoleurs*, who creatively use a variety of QUAL methodological practices.

4. We do not want readers to confuse our use of the term "connoisseur of methods" with the well-known "educational connoisseurship" of Eisner (1998), which involves the art of appreciation and is a "qualitative, artistically grounded approach to educational evaluation" (Eisner, 1979, p. 11).

5. We are not implying that causal effects are examined exclusively by QUAN research or causal mechanisms solely by QUAL research. There are many examples of QUAN results being used descriptively and of QUAL results employed in examining the causes of phenomena (e.g., Maxwell, 2004; Yin, 2003).

6. *Design quality* is the degree to which the investigator has utilized 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).

7. We do not believe in the dichotomy of QUAL and QUAN approaches on the basis of type of questions. Both exploratory and confirmatory questions may be found in QUAN and in QUAL research.

8. Abductive logic is a third type of logic that occurs when a researcher observes a surprising event and then tries to determine what might have caused it (e.g., Erzberger & Kelle, 2003; Peirce, 1974). It is the process whereby a hypothesis is generated, so that the surprising event may be explained.

9. Quantitizing and qualitizing refer to techniques that convert a QUAN-only or QUAL-only into a MMR study. Some researchers within the QUAL community (e.g., poststructuralists) are unlikely to utilize these techniques.

10. Critical realism (Maxwell & Mittapalli, 2010) has recently been proposed as another framework for the use of mixed methods, but its inclusion is beyond the scope of this chapter.

11. In his critique of the metaphysical paradigm, Morgan (2007, p. 68) acknowledged the valuable contribution that it had made in shifting discussions from mechanical concerns about methods only to larger philosophical and conceptual issues.

12. These arguments then lead Morgan (2007, p. 68) to an alternative position, which he called the *pragmatic approach* that concentrates on "methodology as an area that connects issues at the abstract level of epistemology and the mechanical level of actual methods." Morgan's approach emphasizes issues such as abduction, intersubjectivity, and transferability that supersede the traditional dichotomies (e.g., induction/deduction).

13. Maxwell and Loomis (2003) presented a systemic perspective on research design in MMR that was *non-typological* in nature: the interactive model of design, which consisted of five components (i.e., purposes, conceptual framework, research questions, methods, validity).

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