Mapping the Developing Landscape of Mixed Methods Research

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Objectives

From this chapter, readers should obtain:

- a current understanding of the field of mixed methods research that has developed, especially within the last 7 years;
- a view of varied perspectives on the essence of mixed methods, its definitions, and the language that has developed about the field;
- an overview of the current discussion about the philosophical assumptions and theoretical lenses used in mixed methods research;
- a perspective about the emerging detailed procedures for conducting mixed methods; and
- knowledge about recent developments in the field of mixed methods, including disciplinary, international, and funding initiatives.

In the approximate 20-year history of mixed methods (Greene, 2008), the landscape of this field has developed dramatically, especially so in the years since the publication of the first edition of this Handbook (Tashakkori & Teddlie, 2003). The growth in interest can be documented through various social and health science disciplines that have embraced this form of research, new journals exclusively devoted to this approach, conferences hosting symposia and paper presentations on using this form of research, and support from funding agencies for mixed methods projects (Creswell, in press). The circle of scholars and fields embracing mixed methods continues to expand and expand. In light of these developments, it is time to reflect on this developing landscape and to map discussions about issues, priorities, and topics that have emerged. Such a mapping can provide a status report of the field of mixed methods, provide new scholars to the field of mixed methods with a general guide for positioning their studies within the mixed methods literature, and help encourage focused discussions among experienced researchers familiar with the literature on mixed methods.
This chapter maps key developments in mixed methods research and suggests future issues that need to be addressed. This mapping will address developments since 2003 and build on three recent discussions about the status of mixed methods. It will then concentrate on four key domains of topics that have emerged from these status discussions: the essence of mixed methods, the philosophical foundations, the procedures for conducting a mixed methods study, and the adoption and use of mixed methods. The intent of mapping the field of mixed methods is not to “fix” the content or to provide definitive statements about each domain. Instead, it will be to suggest multiple perspectives that have emerged, to raise further questions that need to be addressed, and to offer my voice in the conversation. This chapter will not be an exhaustive treatment of issues and topics, but rather a dialogue about key domains that cross the issues, priorities, and topics in the field, and that I hope will capture recent threads of conversation in the mixed methods community.

Three Recent Discussions About the Current State of Mixed Methods Research

Three discussions have appeared in recent years that help to map the current state of the field of mixed methods: Tashakkori and Teddlie (2003), Greene (2008), and Creswell (2008, 2009a). Issues, topics, and questions being raised in these discussions are listed in Table 2.1. The first was presented by Tashakkori and Teddlie (2003) in the beginning and ending chapters of the first edition of this Handbook. It detailed six major unresolved issues and controversies in the use of mixed methods in social and behavioral research.
### Table 2.1 Issues/Priorities/Topics About Mixed Methods Suggested by Tashakkori and Teddlie (2003), Greene (2008), and Creswell (2008, 2009a)

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<td>The paradigmatic foundations for mixed methods research</td>
<td>• What are the paradigm perspectives in mixed methods research (dialectical, single paradigm, multiple paradigm)?</td>
<td>Philosophical assumptions and stances</td>
<td>What actually does influence inquirers’ methodological decisions in practice?</td>
<td>Philosophical and theoretical issues</td>
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<td>• How do the assumptions and stances of pragmatism influence inquiry decisions?</td>
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A few years later, Greene (2008) published an analysis of key domains in mixed methods in the *Journal of Mixed Methods Research* (JMMR) based on a keynote address presented to the Mixed Methods Special In-
terest Group at the American Educational Research Association in 2007. In setting forth her domains, Greene (2008) asked “what important questions remain to be engaged?” and she raised questions about “priorities for a mixed methods research agenda” (p. 8).

My discussion of topics in the field of mixed methods (Creswell, 2008) was first presented as a keynote address to the 2008 Mixed Methods Conference at Cambridge University in England. My mapping of the field was an attempt to align papers being presented at the conference with my developing understanding of the field, which I had culled from more than 300 submissions during 3 years as co-editor and co-founder of JMMR. From this conference presentation, I then drafted a shorter version as an editorial for JMMR focusing on a few specific issues (Creswell, 2009a).

As shown in Table 2.1, although each discussion is slightly different, there are common thoughts across all three writings, and these ideas will form the domains to be used in mapping the field of mixed methods in this chapter. All three writings address philosophical issues, the procedures in conducting a mixed methods study, and the adoption and use of mixed methods. As for the philosophical issues, all three discussions point to understanding the philosophical foundations of mixed methods, with the two more recent writings (Creswell, 2008, 2009a; Greene, 2008) focusing much more on the *practice* of using philosophical perspectives in mixed methods studies (e.g., how to combine them, how they influence inquiry decisions). That philosophical issues continue to be debated in mixed methods indicates that the paradigm debate of the 1990s is far from over; it continues to occupy discussions about the foundations for mixed methods.

In terms of procedures, Tashakkori and Teddlie (2003) focus on the broader design issues, whereas Greene (2008) and my writings (Creswell, 2008, 2009a) go into detailed areas of methods. This analysis might suggest that our discussions are becoming much more detailed and analytic about how to conduct a study in recent years. This reinforces the assumption that many of us hold that the techniques of conducting mixed methods research have received considerable attention in the field. Regarding the adoption and use of mixed methods, whereas the earlier discussions by Tashakkori and Teddlie (2003) focused on collaboration and teaching mixed methods, the more recent writings by Greene (2008) and Creswell (2008, 2009a) have examined increased use of mixed methods by new disciplines and across fields of inquiry practice. This analysis does suggest the trend of mixed methods spreading to many fields and being adapted to suit unique discipline approaches to research methodology.

The essence of mixed methods and the political domain received uneven treatment in the three writings. For some, the questions about the meaning of mixed methods and the nature of the language it uses continue
to resurface, as illustrated in the issues and topics presented by Tashakkori and Teddlie in 2003 and my topics detailed in 2008 and 2009a. Political issues also have an uneven assessment in that they surfaced more recently in the Greene (2008) and the Creswell (2008, 2009a) discussions. Perhaps with the evolving establishment of the field, critics and concerns about mixed methods are beginning to surface with increased frequency, a topic that I attempt to squarely address in another chapter (see Creswell, in press). Also, in the discussion to follow, I will integrate these political issues and concerns into commentary about the other domains, recognizing that these domains often overlap and can be sorted out for discussion only as a heuristic to promote the conversation.

This discussion, then, is an attempt to look across these three discussions and to focus on specific issues, priorities, and topics that require extended discussion and elaboration. In this discussion, I recognize that many perspectives have emerged and new questions have arisen.

**The Essence of Mixed Methods**

Although Tashakkori and Teddlie (2003) were concerned about the language being used in mixed methods, and they briefly mentioned definitions as one area of interest, they did not anticipate fully the rather extensive discussions that would follow about the core definition for mixed methods, the critique to follow, and the varied language that has emerged.

*On the definition of mixed methods.* A rather extensive discussion has developed in the last few years about how mixed methods should be defined. The definition of mixed methods has undergone considerable revision since the early definition by Greene, Caracelli, and Graham (1989), who focused on the use of multiple “methods.” Then, the conversation moved on to a “methodology” orientation (Tashakkori & Teddlie, 1998) reflected in the title of their book, *Mixed Methodology.* Methods differed from methodology in that the former focused on the procedures of data collection, data analysis, and possibly interpretation, whereas methodology involved everything from the worldview at the start of the research process to the last procedures of inquiry (Guba & Lincoln, 1989). At the center of this recent discussion has been the article on definitions of mixed methods research by Johnson, Onwuegbuzie, and Turner (2007). They asked 21 researchers to define mixed methods and obtained 19 definitions. These definitions differed in terms of what was being mixed (e.g., methods or methodologies, or types of research), the stage of the research process in which mixing occurred (e.g., data collection, data analysis), the breadth of the mixing (e.g., from data to worldviews), the purpose for mixing (e.g., breadth, corroboration), and the drive for the research (e.g., bottom-up, top-down, the core component).
As a result of their review, Johnson et al. (2007) offered 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 purposes of breadth and depth of understanding and corroboration. (p. 123)

Whether one agreed with this definition or not, a reading of the different perspectives illustrated how the definition of mixed methods has been contested territory. An interesting analysis of the nature of mixed methods comes from Elliot (2005), who took the position that to view mixed methods from a "methods" perspectives provided a clean way to view this form of research.

In my own work, I view mixed methods primarily as a method approach (see Creswell & Plano Clark, 2007) because of the difficulty of convincing many individuals that mixing of philosophical foundations is possible (an implicit assumption from the methodological perspective). In my writings and workshops, I suggest that mixed methods is more than simply the collection of two independent strands of quantitative (QUAN) and qualitative (QUAL) data, and I draw a line down between the two approaches. I then mention that mixed methods involves the connection, integration, or linking of these two strands, and I create another line that intersects the QUAN and QUAL data strands. On this line that intersects, I then construct a circle and say that we call this circle mixed methods. I continue on by saying that different groups of scholars have entered this circle. Some come from a methods orientation, others from a methodology orientation, still others from a philosophical orientation, and then some who use mixed methods procedures within their traditional designs, such as experiments, narrative studies, evaluation projects, and so forth. A visual of this diagram, once completed, is shown in Figure 2.1.
This last group to enter the circle needs further elaboration. For lack of a better term, I call this group those who bring in a framework for mixed methods procedures. Some larger framework becomes a placeholder within which the researcher gathers QUAN and QUAL data (or conducts mixed methods procedures). This idea first surfaced when a participant at a workshop asked, “Is ethnography mixed methods research?” The sense of this question was that ethnographers traditionally collect both QUAN and QUAL data and may link the two sets of data as well. Morse and Niehaus (2009) briefly discuss this question and conclude that many ethnographers see their methodology as a distinct approach, and accordingly, ethnography needs to
be viewed as independent of mixed methods. But this certainly is a debatable point. I see researchers using mixed methods within larger frameworks of many different types. Evidence for these frameworks comes from several fields, such as using mixed methods procedures within narrative studies (Elliot, 2005), within experiments (Sandelowski, 1996), and within case studies (Luck, Jackson, & Usher, 2006). Other frameworks could also be advanced, such as using mixed methods within a network analysis framework (Quinlan & Quinlan, 2010) or in the context of an overarching problem or research question (Yin, 2006), a feminist lens (Hesse-Biber & Leavy, 2007), an action research project (Christ, 2009), or visual methodology, such as documentary development (Creswell & McCoy, in press). If the nature of mixed methods can be expanded to include these different applications, then the potential for extending the reach of mixed methods is staggering. Assuming that some see mixed methods as a “new” idea, the way for researchers to adopt a new idea is for it to be integrated into existing practices.

Turning this argument in a different direction, we can see that a broad conceptualization of mixed methods raises the potential problem of the misappropriations of other designs as mixed methods. Where does the mixed methods approach end and other designs and methodologies begin? The prior example about ethnography raises this question. Several other examples illustrate this potential dilemma as well. For example, as one type of mixed methods design, we have written about a sequential QUAL followed by QUAN design for the purposes of developing and testing an instrument (Creswell & Plano Clark, 2007). Is this procedure misappropriating the idea of scale development (DeVellis, 1991), which has been in the literature for some years, or it is an appropriate adaptation of mixed methods research? The early stages of scale development call for an initial exploration, even though this may take the form of a review of the literature rather than a detailed QUAL data collection procedure, such as the use of focus groups (Vogt, King, & King, 2004). Unquestionably, studies calling themselves “mixed methods” studies are being published with the aim of developing an instrument based on QUAL data collection (Myers & Oetzel, 2003). Another example of potential misappropriation involves collecting QUAL data and transforming it into QUAN counts in a mixed methods study. This is the procedure used in traditional content analysis. Have mixed methods researchers misappropriated content analysis for their own ends (a question raised by Sandelowski, Voils, & Knafl, 2009)? I can see arguments on both sides, but as frameworks within which mixed methods procedures are being used take on more importance, the boundaries of mixed methods move well beyond a simple discussion of the definition of the nature of this form of research.

On the language of mixed methods research. Tashakkori and Teddlie (2003) perceptively identified as an im-
portant issue the question of the nomenclature that was becoming part of the language of mixed methods research. Vygotsky and Cole's (1978) sociocultural perspective on language proposed that language shapes how individuals made sense of the world and that the learning process consists of a gradual internalization of this language. So, it is appropriate to ask: What is the language of mixed methods? The issue being raised by Tashakkori and Teddlie (2003) was whether we needed a “bilingual” or new language for mixed methods research so terms did not favor QUAN or QUAL research. I am reminded of the language that emerged in QUAL research in the early 1980s around the topic of QUAL validity, and how terms such as trustworthiness and authenticity created a distinct new language for QUAL inquiry (Lincoln & Guba, 1985).

As mixed methods research develops, similar questions have emerged, and I see a distinct mixed methods language of research emerging. For example, in writing about validity, Onwuegbuzie and Johnson (2006) intentionally called validity legitimacy, to create a separate, distinct term in mixed methods. In our work on research designs, we referred to one of our designs as an exploratory sequential design not only to advance a new, distinct name for a design but also to signify that the research would first explore qualitatively and then follow up quantitatively (Creswell & Plano Clark, 2007). When Teddlie and Tashakkori (2009) speak of inference transferability (p. 311), they have created a blended term with both QUAN (inference) and QUAL (transferability) meanings. These examples illustrate the creation of a bilingual language.

There are counterexamples of names in mixed methods that provide a less bilingual picture. For example, Teddlie and Tashakkori (2009) have used the term inferences or meta-inferences to denote when the results are incorporated into a coherent conceptual framework to provide an answer to the research question. The word inferences is often associated with QUAN research and drawing conclusions from a sample to a population. Another example of a QUAN-leaning term is construct validity, used by Leech, Dellinger, Brannagan, and Tanaka (2010) as an umbrella validity concept for mixed methods research. This term is drawn from long-established QUAN research and measurement ideas and is not a term used by QUAL researchers. On the QUAL side in mixed methods discussions, we have a term such as transformative (Mertens, 2009, p. v), which is typically associated with QUAL research.

Even the terms for the overall approach to inquiry being discussed here are open to debate. Should it be called mixed methods, which suggests a methods orientation; mixed methodology, conveying more of the process of research; or simply mixed research (Johnson et al., 2007), signifying the mixing of research but not necessarily only methods? With the Handbook (Tashakkori & Teddlie, 2003) and the Journal of Mixed
**Methods Research**, a convincing case could be made that *mixed methods*, especially since 2003, has been widely adopted in the literature.

Unquestionably, the language that has emerged is both bilingual and oriented toward QUAN or QUAL inquiry. The use of glossaries in recent books on mixed methods is an attempt to establish the language of mixed methods (see Morse & Niehaus, 2009; Teddlie & Tashakkori, 2009). I am inclined to support the conclusion reached by Tashakkori and Teddlie (2003): that ultimately a bilingual language will win the day in mixed methods research. If mixed methods is to be considered a “third methodological movement” (Tashakkori & Teddlie, 2003, p. 697), one could argue that it needs its own distinct language.

This being said, this discussion raises important questions for further discussion about who controls the language of mixed methods, how it is conveyed, and what the language should be as the field moves forward. Freshwater (2007) asks: Who is dominating the discourse? Is it a “fixed” discussion, not open to alternative perspectives? Are individuals merely adopting mixed methods as a mantra without thinking through the possibilities? Is mixed methods becoming another metanarrative that needs to be deconstructed? This postmodern line of questioning has emerged recently, and it can be viewed as a healthy critique of mixed methods. A related philosophical critique is that mixed methods favors a postpositivist orientation, elevates QUAN experimental methods to the top of the methodological hierarchy, and constrains QUAL research to a largely auxiliary role of “what works” (Howe, 2004). This hierarchy also promotes mixed methods practice as evidence-based approaches, attractive to funding agencies (Giddings, 2006). In addition, mixed methods research inappropriately mixes different paradigms based on different realities (Sale, Lohfeld, & Brazil, 2002).

**The Philosophical and Theoretical Foundations of Mixed Methods**

The philosophical issues surrounding mixed methods have received and continue to receive considerable discussion in the field of mixed methods. Extensive discussions are to be found in both Tashakkori and Teddlie (2003) and Greene (2008) about the paradigmatic or philosophical foundations for mixed methods research. Tashakkori and Teddlie (2003) discussed the different perspectives that have emerged (e.g., dialectical, single paradigm, and multiple paradigm), whereas Greene (2008) focused her attention on pragmatism and on the practical question of how the philosophical perspectives influenced the actual practice of research.

**Recent developments in the philosophy discussion.** Both Tashakkori and Teddlie (2003) and Greene (2008)
reconstructed for readers what is now becoming a well-known litany of different stances about the philosophical foundations of mixed methods (also see Greene & Hall, 2010 [this volume]). One stance holds that paradigms are different (incommensurable stance) and cannot be mixed; thus, mixed methods research is an untenable proposition. Another stance is that the paradigms are independent and can be mixed and matched in various combinations (an aparadigmatic stance). A further perspective is that the paradigms are not incompatible, but they are different and should be kept separate in mixed methods research (complementary strengths stance). Also, the paradigms are different in important ways, and this difference can lead to useful tensions and insights (a dialectic stance) and should be honored. In addition, a single paradigm provides the foundation for mixed methods, and this foundation may be found in pragmatism or a transformative-emanipatory perspective (an alternative paradigm stance). And finally, paradigms can be mixed in a study and linked to the type of design being used (design stance). These varied stances suggests a lively conversation about paradigms in the mixed methods field, differences of opinions, and a continuation of the paradigm debate that was discussed in the literature during the 1990s (see Greene & Caracelli, 1997).

Adding to the perspectives is the perception that paradigms represent rigid categories of information. This seemed to be reinforced by the discrete boxes around different paradigm stances (see Creswell, 2009b; Lincoln & Guba, 2000). Such rigid boundaries were not suggested by Kuhn (1970), who many scholars turn to as the major architect of the paradigm discussion. For the mixed methods community, the issue now becomes identifying whether or how the field has moved beyond the different paradigms and the stances.

Recently, mixed methods writers have returned to Kuhn's (1970) idea of a community of practitioners. Kuhn defined paradigms as “what members of a scientific community share” (p. 176). Two key articles appeared in 2007 and 2008 in the Journal of Mixed Methods Research by an American author, David Morgan, and a British author, Martin Descombe. Morgan's (2007) article is a fascinating piece of scholarship, and it was first presented in 2005 as the keynote address at the Mixed Methods Conference in Cambridge, England. Morgan (2007) saw paradigms as “shared belief systems that influence the kinds of knowledge researchers seek and how they interpret the evidence they collect” (p. 50). He also saw four versions of the concept of paradigms and asserted that these versions had different levels of generality. First, paradigms can be seen as worldviews, all-encompassing perspectives on the world, or second, they can be seen as epistemologies incorporating ideas from the philosophy of science such as ontology, methodology, and epistemology. Third, paradigms can viewed as the “best” or “typical” solutions to problems, and fourth, paradigms may represent shared beliefs of a research field. Morgan strongly endorsed this last perspective. Researchers, he said,
share a consensus in specialty areas about what questions are most meaningful and which procedures are most appropriate for answering the questions. In short, many practicing researchers understand paradigms from a “community of scholars” perspective (p. 53). According to Morgan, this was the version of paradigms that Kuhn (1970) most favored.

Denscombe (2008) reinforced Morgan’s thoughts and added more details about the nature of the community. He outlined how communities work using such ideas as shared identity, common research problems, social networks, knowledge formation, and informal groupings. These ideas seem to begin formulating an answer to Greene’s (2008) question about how philosophy actually influences researchers’ decisions. It also speaks to Greene’s (2008) interest in learning from conversations across disciplines and fields of practice. The mixed methods field is becoming fragmented by discipline orientation, and it will ultimately be shaped, I believe, by strong subject matter interests. For example, when I hear my colleagues in the health sciences at the Veterans Administration Health Services Research Center in Ann Arbor, Michigan, talk about mixed methods as “formative” and “summative” evaluation procedures, I recognize that a unique field or discipline orientation to mixed methods is being applied (Forman & Damschroder, 2007).

On theoretical orientations. Neither Tashakkori and Teddlie (2003) nor Greene (2008) addressed directly the theoretical perspectives discussion that has developed in the mixed methods field in recent years. To place this topic in perspective, I have often found useful Crotty’s (1998) conceptualization of the different hierarchical levels of perspectives that might be incorporated into a research study: from the broad epistemological perspective (e.g., objectivism, subjectivism) to the theoretical perspective (e.g., feminism, critical inquiry), to methodology (e.g., experimental research, ethnography), and on to the methods (e.g., sampling, observation). Theory, in this placement, resided immediately below the epistemology level, and it helped to inform the methodology and the methods. The question that is emerging is: How does one use theory in a mixed methods study? My conceptualization of an answer to this question is to consider how theory might be drawn either from a social sciences theory (e.g., a theory of attribution, a theory of leadership, a theory of diffusion and adoption) or from an advocacy theory. A social science theory is positioned at the beginning of mixed methods studies, and it provides a framework for asking questions and gathering data. An advocacy (or emancipatory) theoretical lens has been part of the discussion in QUAL research for some time. It involves taking a theoretical position for underrepresented or marginalized groups, such as a feminist theory, a racial or ethnic theory, a sexual orientation theory, or a disability theory (Mertens, 2009). With one goal of QUAL research being to address issues of social justice and the human condition (Denzin & Lincoln, 2005), this emphasis has come
to be expected from some scholars in mixed methods research. However, we noted a couple of years ago that few studies incorporated the advocacy/emancipatory lens in mixed methods studies (Creswell & Plano Clark, 2007). Some writers have criticized mixed methods for not being interpretive enough and not honoring ends associated with social justice, such as understanding people in their own terms, engaging stakeholders in dialogue, and encouraging a democratic role for participants (Howe, 2004). Denzin and Lincoln (2005) discussed how the mixed methods movement has taken “qualitative methods out of their natural home, which is within the critical, interpretive framework” (p. 9). These concerns have raised my awareness of the need for more mixed methods studies with an advocacy/emancipatory theoretical lens. However, such studies are appearing in the mixed methods literature, such as a study of African American women’s interest in science and an investigation of women’s social capital in Australia (Buck et al., 2009; Hodgkin, 2008). Recent writings have linked feminist standpoint epistemology to mixed methods (Hesse-Biber & Leavy, 2007).

With these developments, it is important to begin thinking about how to incorporate an advocacy/emancipatory theoretical lens into a mixed methods study. A recent paper analyzed 12 mixed methods studies (Sweetman, Badiee, & Creswell, in press) incorporating an advocacy theoretical lens and made suggestions for incorporating this lens into a study. It suggested including the theoretical lens in the beginning of the study as a framework, discussing the literature using the lens, making explicit the research problem and advocacy issue, writing research questions using advocacy language, collecting data to not further marginalize the community, positioning oneself in the research, and suggesting a plan of action or change. Despite these suggestions, more work needs to be done to establish how the procedures of mixed methods might change depending on the type of advocacy lens (e.g., feminist, racial) being used.

**Procedures for Conducting Mixed Methods Research**

As Greene (2008) states, no area has been discussed more in the mixed methods literature than the methods and procedures. In research procedures, the techniques seem to be developing at a rapid pace from the larger questions of research designs to the more detailed areas of data collection and the steps in the research process.

*Research designs.* Tashakkori and Teddlie (2003) point to the use and types of research designs as important issues to address. When we wrote about mixed methods in 2007, my colleague, Plano Clark, and I reviewed...
12 different typologies of design drawn from writing in diverse fields such as evaluation, public health, education, and primary medical care (Creswell & Plano Clark, 2007). Authors of these typologies used different terms, advanced different diagrams of procedures, and suggested different purposes for the types of designs. In addition, new mixed methods books have advanced their own preferred typologies (e.g., Morse & Niehaus, 2009; Teddlie & Tashakkori, 2009).

In the spirit of helping beginning mixed methods researchers, we suggested in 2007 a parsimonious set of designs that were most prevalent, and we advanced four designs—triangulation, embedded, explanatory, and exploratory—and variations of them, amounting to 10 different designs (Creswell & Plano Clark, 2007). The lesson we immediately learned from feedback has been that the designs actually being used are often much more complex. For example, in the field of evaluation, the multiphase procedures may involve an initial needs assessment, the development of a program, the testing and administering of an instrument to assess the efficacy of the program, and the revisions and continued development of the program. This procedure calls for several phases of both QUAN and QUAL data collection. A good illustration is the longitudinal evaluation and intervention study of youth in Sri Lanka (Nastasi et al., 2007). In one table, the authors present five phases of the research involving both concurrent and sequential phases of data collection. This combination of both concurrent and sequential phases of data collection can be found today in published studies (e.g., see Woolley, 2009). In sum, the discussion of typologies of design has moved beyond simple two-phase projects (e.g., QUAN followed by QUAL) to multiphase programs of inquiry stretching over many years and incorporating many elements.

Still, to figure out the designs, a rather simple logic prevails that has been a mainstay of mixed methods for several years. Greene (2008) elegantly summarizes the primary dimensions that distinguish among the designs and their typologies: the degree to which different methods are implemented independently or interactively (independence/interaction), the priority or dominance given to one methodology or another versus equality (status), and whether the different methods are implemented concurrently or in sequence (timing). For a novice mixed methods researcher, thinking about these three dimensions certainly provides a strong foothold into interpreting the many designs available.

Along with these designs, we now have an ever-expanding notation system (Creswell & Plano Clark, 2007; Morse, 1991; Morse & Niehaus, 2009). As shown in Table 2.2, the notation has developed beyond the use of capital letters, lower-case letters, arrows, and plus signs to include the embedding of one form of data within...
a larger design (e.g., a QUAL component added to an experiment); the inclusion of a purpose or rationale in the notation system; and the use of symbols that help to explain multiphase, interrelated studies in a program of inquiry. Diagrams of procedures are now comment elements in mixed methods studies, appearing in published empirical articles along with written instructions as to how to draw diagrams (Ivankova, Creswell, & Stick, 2006).

As shown in Figure 2.2, these authors provided a figure of their procedures in a mixed methods study of students' persistence in a distributed doctoral program in educational leadership in higher education. Their diagram illustrated several elements in designing a figure to portray mixed methods procedure. Boxes and

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<th>Explanation for Notation</th>
<th>Key References Citing Notation</th>
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<tr>
<td>QUAL, QUAN</td>
<td>Shorthand labels for qualitative and quantitative that denote equality between the two approaches because of an equal number of letters</td>
<td>Morse (1991)</td>
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<tr>
<td>QUAL + QUAN</td>
<td>Both the quantitative and qualitative methods occur at the same time (concurrently)</td>
<td>Morse (1991)</td>
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<tr>
<td>QUAL→quan</td>
<td>The methods occur in a sequence, with the qualitative methods occurring before the quantitative methods and building on them</td>
<td>Morse (1991)</td>
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<td>QUAN→qual</td>
<td>Capital letters indicates theoretical drive or priority (core methods) given in a study; lower case indicates (supplemental methods)</td>
<td>Morse (1991); Morse &amp; Niehaus (2009)</td>
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<td>QUAN(qual)</td>
<td>The qualitative methods are embedded within a quantitative design</td>
<td>Creswell &amp; Plano Clark, 2007; Plano Clark &amp; Creswell, 2008</td>
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<tr>
<td>QUAN + QUAL = convergence</td>
<td>The equal sign identifies the purpose or rationale for the design</td>
<td>Morse &amp; Niehaus (2009)</td>
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<tr>
<td>QUAL→[QUAN→qual]</td>
<td>Square brackets indicate a self-contained project within a series of interrelated studies The larger font indicates core methods or theoretical drive; smaller font indicates supplemental methods</td>
<td>Morse &amp; Niehaus (2009)</td>
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</table>
circles indicated the general flow of data collection and analysis, arrows showed sequence, bulleted points in a column detailed the procedures for each stage in the sequence, and additional bulleted points in another column identified products to emerge in each phase (which funding agencies like to see). In my experience, these figures are being adopted with increasing frequency in mixed methods writings, and they are a welcome relief for readers who recognize the complex procedures of multiple data collection and analysis that is central to mixed methods.
Figure 2.2 An Example of a Diagram of Mixed Methods Procedures
In addition, mixed methods designs have begun to incorporate unusual blends of methods. For example, in

<table>
<thead>
<tr>
<th>Phase</th>
<th>Procedure</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative Data Collection</td>
<td>- Cross-sectional web-based survey (N = 278)</td>
<td>- Numeric data</td>
</tr>
<tr>
<td></td>
<td>- Data screening (univariate, multivariate)</td>
<td>- Descriptive statistics, missing data, linearity, homoscedasticity, normality, multivariate outliers</td>
</tr>
<tr>
<td></td>
<td>- Factor analysis</td>
<td>- Factor loadings</td>
</tr>
<tr>
<td></td>
<td>- Frequencies</td>
<td>- Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>- Discriminant function analysis</td>
<td>- Canonical discriminant functions, standardized and structure coefficients, functions at group centroids</td>
</tr>
<tr>
<td></td>
<td>- SPSS quan. software v. 11</td>
<td>- Cases (N = 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Interview protocol</td>
</tr>
<tr>
<td>Case Selection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview Protocol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualitative Data Collection</td>
<td>- Purposefully selecting 1 participant from each group (N = 4) based on typical response and maximal variation principle</td>
<td>- Text data (interview transcripts, documents, artifact description)</td>
</tr>
<tr>
<td></td>
<td>- Developing interview questions</td>
<td>- Image data (photographs)</td>
</tr>
<tr>
<td>Qualitative Data Analysis</td>
<td>- Individual in-depth telephone interviews with 4 participants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Email follow-up interviews</td>
<td></td>
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<td></td>
<td>- Elicitation materials</td>
<td></td>
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<td></td>
<td>- Documents</td>
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<tr>
<td></td>
<td>- Lotus Notes courses</td>
<td></td>
</tr>
<tr>
<td>Integration of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative and Qualitative Results</td>
<td>- Coding and thematic analysis</td>
<td>- Visual model of multiple case analysis</td>
</tr>
<tr>
<td></td>
<td>- Within-case and across-case theme development</td>
<td>- Codes and themes</td>
</tr>
<tr>
<td></td>
<td>- Cross-thematic analysis</td>
<td>- Similar and different themes and categories</td>
</tr>
<tr>
<td></td>
<td>- QSR N6 qualitative software</td>
<td>- Cross-thematic matrix</td>
</tr>
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</tbody>
</table>

Singer, Ryff, Carr, and Magee (2002), the study of the mental health of individuals was formed using longitudinal-survey data to create rich life-history narratives. Articles are beginning to explore results (e.g., confirming, diverging, complementary) that emerge when synthesizing QUAL and QUAN data (Voils, Sandelowski, Barroso, & Hasselblad, 2008). The representation of designs has also advanced with joint displays of QUAN and QUAL data in the same table (see the joint display provided by Lee & Greene, 2007).

A fascinating trend to watch is the reconceptualization of research designs away from typologies to other ways of thinking about designs. Three examples illustrate this recent trend. First, using systems theory, Maxwell and Loomis (2003) conceptualized the interactive five dimensions of the research process consisting of the purpose, the conceptual framework, the questions, the methods, and the issue of validity. Thus, design, in their approach, gave way to the process of research for a fuller, more expansive view of the way to conceptualize and design mixed methods research.

Another approach has been the innovative thinking of Hall and Howard (2008). They advanced a synergistic approach in which two or more options interacted so that their combined effect was greater than the sum of the individual parts. Translated into mixed methods, this means that the sum of QUAN and QUAL research is greater than either approach alone. Instead of looking at mixed methods as the priority of one approach over the other, or of a weighting of one approach, the researchers consider the equal value and representations of each. Instead of unequal importance of the two approaches, the two are viewed from an ideology of multiple points of view rather than differences. Collaboration on a mixed methods project means that researchers share their areas of expertise. The researchers also balance objectivity with subjectivity. In sum, the synergistic approach, along with other challenges to typological perspectives, has contributed to a softening of the differences between QUAL and QUAN research, has provided answers to questions about dominance of one method over the other (e.g., Denzin & Lincoln, 2005), and has honored the formation of research teams with diverse expertise.

A final approach to designs is somewhat of a blend of traditional thinking and a reconceptualization. Morse and Niehaus (2009) called attention to the theoretical drive of a study, which informed the type of design used. They defined theoretical drive as the core methods component in a study and indicated that researchers could identify this component by whether their study was approached inductively or deductively. Thus, they saw all designs as having a core component and a supportive component.

Validity and evaluation discussions. Validity concerns have become much more a part of the discussion of
mixed methods research. The traditional approach is to talk about validity from a QUAN perspective and from a QUAL perspective but not to mix the two (Tashakkori & Teddlie, 1998). More recently, several perspectives have developed to conceptualize validity. First, a framework for viewing validity has been assembled by Leech et al. (2010). They used the term construct validity as the overarching framework and felt that validity permeated all phases of the research process, including a review of the literature, the design and evaluation of a study, inferences drawn, the use of the findings, and the consequences of the findings. This perspective clearly built on ideas about construct validity that emerged from QUAN research in recent years (e.g., Messick, 1995).

Second, an attempt has been made to link evaluation standards with validity concerns. For example, Teddlie and Tashakkori (2009) addressed the inference process of research and how mixed methods research needed should be assessed for design quality (suitability, adequacy/fidelity, consistency, and analytic adequacy) and interpretive rigor (interpretive consistency, theoretical consistency, interpretive agreement, interpretive distinctiveness, and integrative efficacy). Again, this perspective drew on the close connection between inferences and validity standards; the idea that validity (construct) is the drawing of inferences to make generalizations is a QUAN perspective.

Third, a new set of validity terms unique to mixed methods research has been developed by Onwuegbuzie and Johnson (2006). To create a bilingual language for mixed methods, they called validity legitimation, and they advanced a typology of nine forms of legitimation in mixed methods research. These forms related to such factors as sampling designs the sequence of phases in the design, the blending of paradigmatic assumptions, and the quality of the inferences. A fourth and final stance has been to view validity concerns as related to types of designs, a connection that was established by Campbell and Stanley (1966) when they discussed types of internal and external validity threats to experimental and quasi-experimental designs. We have taken this perspective (Creswell, Plano Clark, & Garrett, 2008) and have called these concerns methodological and validity threats. For example, in a convergent parallel design in which the researcher collects both QUAN and QUAL data (Creswell & Plano Clark, in press), issues that might pose a validity threat to drawing meaningful and useful conclusions relate to whether the same constructs (or questions) are being assessed with both forms of data, whether the unequal sample sizes pose threats to drawing conclusions, and whether conclusions drawn from assessing discrepancies in merging the results favor the QUAL or the QUAN data results.
In summary, the discussions about the procedures of mixed methods have moved the conversation beyond a justification for this form of inquiry (Tashakkori & Teddlie, 2003) and into detailed suggestions for how to proceed with conducting a mixed methods project. In terms of design, Kelle ((2006) seems on target when he suggested that there is currently no canonization of mixed methods designs. Perhaps, as Greene (2008) mentioned, practice will lead the way toward a consensus around designs. Indeed, in the last couple of years, there have been detailed discussions about the procedures used by research teams and individuals as they negotiated issues in completing a mixed methods project. For example, a recent article by Brady and O'Regan (2009) discussed a mixed methods study of a youth mentoring program in Ireland and highlighted the journey of the team through adopting a type of design, establishing an epistemological position, and conducting data analysis using various methods and sources.

The future bodes well for further developments in procedures (as when Greene, 2008, called for understanding mixed methods practice). One of these is a need to better understand the steps in data analysis, especially how, when, why, and where the data are “mixed,” or what Morse and Niehaus (2009) call the “point of interface” (p. 25). Knowing data analysis procedures will lead to the potential for more useful software applications for analysis extending current discussions (see Kuckartz's 2009 paper on realizing mixed-methods approaches with MAXQDA). Continued discussions of potential stances about validity are also needed (Dellinger & Leech, 2007) as well as conversations about ethical issues (see Mertens & Ginsberg, 2009). The writing phase of the procedures needs further discussion as journal editors call for articles within a 3,000- or 5,000-word limit, especially in the health sciences (see the discussion on this subject in Dahlberg, Wittink, and Gallo, 2010 [this volume]). For example, Stange, Crabtree, and Miller (2006) have discussed writing forms such as publishing separate QUAN and QUAL papers from a mixed methods study, staging their papers as separate articles in a single issue of a journal, or integrating their methods into a single article.

Adoption and Use of Mixed Methods

It is difficult to accurately gauge the extent to which mixed methods research has developed, especially since 2003. Neither Tashakkori and Teddlie (2003) nor Greene (2008) specifically discussed the emerging adoption of this approach, although Greene (2008) pointed to the issue that we needed to learn more from conversations across disciplines and fields of applied inquiry practice. Tashakkori and Teddlie included chapters in the first edition of the Handbook that addressed mixed methods within the context of evaluation, management
and organizational research, the health sciences, nursing, psychology, sociology, and education. We can see evidence of development through such indicators as the numerous journal articles from many disciplines mentioned in the books on mixed methods research (Creswell & Plano Clark, in press; Morse & Niehaus, 2009; Teddlie & Tashakkori, 2009). Also, the term mixed methods is now appearing in titles of mixed methods empirical journal articles with increased frequency (e.g., Slonim-Nev & Nevo, 2009). Numerous books now exist about the procedures of mixed methods, and new books are coming out each year. Discipline- or field-based books are now available, such as the book on mixed methods in nursing and the health sciences (Andrew & Halcomb, 2009).

Several journals are now devoted to publishing methodology discussions and empirical mixed methods studies, such as the Journal of Mixed Methods Research (JMMR), Quality and Quantity, Field Methods, and the online journal, International Journal of Multiple Research Approaches. For JMMR, the reception has been impressive during the publication of three volumes of publications, and the receipt of more than 300 manuscripts. Still, within this broader picture, three trends are noteworthy that will likely shape the future of mixed methods research: disciplinary developments, international growth, and funding opportunities.

On disciplinary developments. Over the years, an emerging trend has been for authors to summarize the published mixed methods studies in a given discipline or field of study. This began with the classic article by Greene et al. (1989), who reviewed 57 studies in the field of evaluation. It continued on with the analysis of design decisions for studies reported in the field of higher education (Creswell, Goodchild, & Turner, 1996); interviews with scholars in the fields of family medicine, physics education, and counseling psychology (Plano Clark, 2005); reviews of 232 mixed methods studies in four social sciences disciplines (Bryman, 2006a), and more recently, a review of 75 mixed methods studies in marketing (Harrison, unpublished). Within specific disciplines, mixed methods research has been the focus of special issues of journals such as the Annals of Family Medicine (see Creswell, Fettas, & Ivankova, 2004) and the Journal of Counseling Psychology (see Hanson, Creswell, Plano Clark, Petska, & Creswell, 2005). An openness is being expressed by journals traditionally oriented toward QUAN research, such as a cardiology journal (see Curry, Nembhard, & Bradley, 2009), a psychology trauma journal (see Creswell & Zhang, 2009), and a school psychology publication (Powell, Mihalis, Owuegbuzie, Suldo, & Daley, 2008). New discipline-based groups and conferences are emerging with a special interest in mixed methods, such as the Special Interest Group in the American Educational Research Association, which is now 4 years old, and the special session on QUAL and mixed methods research that was held at the American Psychological Association meeting in Toronto in August 2009.
What factors are contributing to this disciplinary dispersion of mixed methods? Plano Clark (2005) assessed factors that signaled the acceptance of a new method within a discipline and found that it involved graduate students asking to use the methods in their research, disciplinary leaders advocating for the use of the new method, and researchers publishing studies that apply the new method. She concluded that mixed methods in the fields of physics education, primary care, and counseling psychology had not yet reached mainstream status.

Increased study of how different fields and disciplines have embraced mixed methods needs to be undertaken. In addition to learning more about factors that facilitate acceptance, we also need to learn more about how disciplines shape mixed methods to fit their needs. Studying, for example, how intervention researchers incorporate QUAL data into their clinical trials can portray an adaptation of mixed methods to traditional evidenced-based medicine (see the discussion about mixed methods intervention trials in Creswell, Fetters, Plano Clark, & Morales, 2009).

Although such experimental trials have raised questions about the subversion of QUAL research to the dominant QUAN methodology in the health sciences (see Howe, 2004), the use of mixed methods does serve to bring QUAL research into the health sciences in an acceptable manner where it has not gained much entry. Also, discipline-based approaches, such as geographical information systems (GIS), are being seen as applications of mixed methods procedures in fields such as sociology (Fielding & Cisneros-Puebla, 2009).

On international growth. That mixed methods research is moving out beyond the disciplines to many countries around the world cannot be disputed. Recent publications in JMMR attest to strong international participation, for example, from Sri Lanka (Nastasi et al., 2007), Germany (Bernardi, Keim, & von der Lippe, 2007), Japan (Fetters, Yoshioka, Greenberg, Gorenflo, & Yeo, 2007), and the United Kingdom (O'Cathain, Murphy, & Nicholl, 2007). The Mixed Methods Conference, now hosted by Leeds University in the United Kingdom, has completed 5 years with growing numbers each year, and in 2010, the conference will come to the United States for the first time. Over the years, American scholars have been involved in this conference, thus lessening the “Atlantic gap” that often occurs between U.S. academics and those from other countries. An international community is forming around mixed methods, with discussions about the QUAN and QUAL skills needed to undertake this form of inquiry and the need, especially in countries such as South Africa, for involvement of individuals with QUAN skills amid the preponderance of QUAL talent.
What may encourage more international cooperation is the advent of courses in mixed methods. Mixed methods courses have been part of the conversation about mixed methods over the years, with discussion about the content and instructional approaches of the courses (Creswell, Tashakkori, Jensen, & Shapley, 2003); about teaching graduate students to learn, use, and appreciate both QUAN and QUAL research within a mixed methods framework (Onwuegbuzie & Leech, 2009); and about identifying the strengths, challenges, and lessons learned from teaching mixed methods courses (see Christ, 2009). Several international online mixed methods courses are now available, offered in the United States at the University of Nebraska-Lincoln and at the University of Alabama-Birmingham. Articles such as Christ’s (2009) highlight the importance of examining pedagogical issues, which was suggested by Tashakkori and Teddlie (2003), as well as understanding the practical application of mixed methods, as indicated by Greene (2008). However, as with discipline developments, it remains to be seen how different countries (some with much less of a pedagogical orientation than the United States) embrace mixed methods, train individuals outside of coursework in QUAN and QUAL skills, and adapt the inquiry methods to best fit current local problems and issues.

On funding opportunities. A concern is sometimes raised that mixed methods is simply a response to funding sources (Giddings, 2006) and the need to develop proposals that respond to funding agencies (see Dahlberg et al., 2010 [this volume]). Despite these concerns, neither Tashakkori and Teddlie (2003) nor Greene (2008) raised this concern or touched on the topic of funding and mixed methods research. Funding could be viewed as a stimulus for mixed methods research as well as an inhibiting force. I am inclined to view it as a helpful stimulus. In the United States, the National Institutes of Health (NIH, 1999) took the initiative several years in developing guidelines for combined QUAN and QUAL research, although these guidelines are in need of drastic revision today based on recent mixed methods developments. In 2004, NIH held a workshop titled, “Design and Conduct of Qualitative and Mixed-Methods Research in Social Work and Other Health Professions,” sponsored by seven NIH institutes and two research offices. In 2003, the U.S. National Science Foundation held a workshop on the scientific foundations of QUAL research, with several papers devoted to the topic of combining QUAL and QUAN methods (Ragin, Nagel, & White, 2004). Private U.S. foundations, such as the Robert Wood Johnson Foundation and the W. T. Grant Foundation have had workshops on mixed methods research (Creswell & Plano Clark, 2007). In the United Kingdom, the Economic and Social Research Council’s (ESRC) has funded inquiries into the use of mixed methods research through its Research Methods Programme (Bryman, 2006b).

On the U.S. side, and in light of the interest expressed in mixed methods research, Plano Clark (2009) has ex-
Examining only the new funding awards (identified in the first year of funding) and using the search terms *mixed methods* or *multimethod*, Plano Clark obtained 272 hits from the NIH RePORTER (http://www.projectreporter.nih.gov/reporter.cfm) for the period of 1997 to 2008. Her review of these projects showed a steady increase in the use of the terms *mixed methods* and *multimethods* in funded project abstracts during this time period. Funding for the projects came from 25 different NIH agencies (with the National Institute of Mental Health funding the largest percentage of projects at 24%), one indicator of the widespread interest in this approach. As might be expected, 27% of the projects included an experimental or control trial component, and many projects revealed complex designs and design names, such as a “mixed methods prospective randomized controlled study” or a “longitudinal mixed methods descriptive study,” or an “equivalent, sequential, transformative, mixed-methods study.” The names alone present the immense variation that exists in undertaking health science mixed methods projects. In my own work with the RePORTER database, I have explored the K01 awards given to new scholars who present both a plan for career development as well as a substantive project. Looking solely at the funded projects for 2007, a number of these projects funded included a training component related to QUAL research and mixed methods.

Looking broadly at this area of funding, I feel that our understanding of adoption and use of mixed methods by funding agencies still deserves increased attention. Little seems to be known about funding from agencies in international countries, funding specific to disciplines, and funding that incorporates mixed methods into existing methodologies and designs, such as the substantial use of mixed methods within a clinical, experimental context at NIH.

**Conclusions**

There are certainly parallels among the four themes I have discussed and the issues and important questions identified by Tashakkori and Teddlie (2003), Greene (2008), and myself. The perspective advanced in this chapter has perhaps expanded and added to the discussion the work of new authors, especially authors publishing in the *Journal of Mixed Methods Research*. My domain discussions have focused less on the justification for mixed methods and more on the stages of mixed methods procedures, such as inferences, as stated by Tashakkori and Teddlie (2003). It has addressed less the sociopolitical commitments suggested by Greene
(2008), although I have included a number of references to critiques of mixed methods and the emerging postmodern perspective. My assessment suggests the numerous stances that have emerged in the etiology of mixed methods, and I have characterized these stances as a healthy indicator of the field. I have incorporated recent writings that suggest new developments and new insights that are beginning to shape the field, and, by raising questions throughout this discussion, I hope to stimulate further inquiries and new threads of thinking. Where mixed methods will be in 10 years is anyone's guess; I can only hope that my discussion has highlighted several themes—about the nature of mixed methods, the philosophical and theoretical debates, the procedures in conducting mixed methods research, and the adoption and use of it—that will be taken up later and expanded on with future new developments in mixed methods.

Research Questions and Exercises

1. What common features do you see in the issues/priorities/topics advanced in Table 2.1 by Tashakkori and Teddlie (2003), Greene (2008), and Creswell (2008, 2009a)?
2. How has the definition of mixed methods research changed over the years?
3. Should the field of mixed methods research establish its own language, a bilingual language of its own?
4. How has the discussion about the philosophical foundations for mixed methods changed in recent years?
5. How has the discussion about the research designs in mixed methods developed in recent years?
6. What are the trends in international and discipline adoption of mixed methods to surface recently?

References


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