The Curious Case of Complexity: Implications for Mixed Methods Research Practices

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ABSTRACT
All research takes place under conditions of complexity; yet, too often, researchers attempt to reduce, control, or simply ignore the effects of complexity rather than revisiting underlying assumptions and adapting our research practices. Mixed methods researchers are only beginning to grasp the effects of complexity on our work and admit the demand for more complexity-sensitive practices. The current article, providing the groundwork towards realizing the distinct niche occupied by a complexity-sensitive approach to mixed methods research practices, has the following three purposes (a) to advance a practical framework for diagnosing 4 interrelated dimensions of complexity in mixed methods research, (b) to apply a complexity lens to transform some mixed methods research practices, and (c) to discuss the practical and theoretical implications of a complexity-sensitive approach to mixed methods research for enhancing research capacity under conditions of complexity.

KEYWORDS
Complexity science; mixed methods research

Mixed methods research is not new; evidence of its use was discovered more than two centuries ago (e.g., Johnson, Onwuegbuzie, & Turner, 2007; Mertens et al., 2016a). Although the field enjoys a long history, developments in the past four decades have solidified the unique contributions of a mixed methods approach to research (Maxwell, 2016). Ever expanding purposes and contexts in which mixed methods research is applied has led to conceptual and methodological innovations—particularly noteworthy areas of innovations within the last two decades involve, but are not limited to, new designs and insights. Among the qualities that I appreciate most about the field of mixed methods research (and its community of researchers) is that promising practices continue to emerge to support the expansion of purposes and contexts. Although such developments might limit the capacity for establishing best practices for researchers to follow, evolving practices might inspire further diversity in the contexts where mixed methods research is applied and the purposes whereby mixed methods research is suited. My experiences as an applied researcher working as a member of interdisciplinary teams across diverse research contexts and methodologies provide the impetus for my desire to contribute as well as to build upon existing mixed methods research practices. I adopt the definition of a mixed methods research practice as “any application of mixed methods research in advocating for, planning, conducting, disseminating, and evaluating the mixed methods research approach by researchers, scholars, and other stakeholders” (Plano Clark & Ivankova, 2016, p. 4). The call for innovative practices is highlighted by the pressing need to address complex mixed methods research problems; this need is particularly acute when the demand for expertise continues to outpace supply (Bowers et al., 2013).

Donna Mertens (2015) used her final editorial space in the Journal of Mixed Methods Research to outline some pressing challenges and unrealized potential for the mixed methods research community. She used the term wicked problems to describe research problems that “involve multiple interacting systems, are replete with social and institutional uncertainties, and for which only imperfect knowledge and about their nature and solutions exist” (p. 3). She argued (using illustrative examples, no less) that mixed methods research holds potential for contributing to understanding these problems that have no completely right solutions and yet present pressing issues requiring attention. Mertens (2015) concluded with a call to action to the community of mixed methods...
researchers, stating: “business as usual will not lead to effective use of research to address wicked problems, problems for which time for solutions is running out” (p. 5). More recently, Mertens et al. (2016a) described the future of mixed methods in their report to the Mixed Methods International Research Association (MMIRA) as kaleidoscopic, with its “seemingly unpredictable patterns full of rich possibilities for diversity and potential to provide opportunities to see things that have not yet been seen” (p. 222). As mixed methods researchers, our responses to dynamic influences pose dilemmas and offer opportunities. All too often, our responses involve attempts to reduce, control, or simply ignore the effects of complexity rather than revisiting our assumptions, transforming our approach, or monitoring our conditions. The time has come for mixed methods research practices to appropriately guide our responses to address some of the dilemmas and harness some of the opportunities afforded by mixed methods research under conditions of complexity.

That researchers are generally unprepared to navigate conditions of complexity is not surprising, given the considerable focus of methodological training for addressing mixed methods research problems based on assumptions of stability and isolation. Many leading mixed methods research resources advise researchers to focus their design practices on the following key tasks: identify a research problem to pursue; explain the need to integrate qualitative and quantitative data; select a research design to address the problem; and describe the procedures of the design related to qualitative and quantitative data collection, analysis, and integration. (e.g., Creswell & Plano Clark, 2011; DeCuir-Gunby & Schutz, 2017; Teddlie & Tashakkori, 2009). Notice the lack of attention to the surroundings in which the research is to be undertaken. That mixed methods researchers have not paid greater attention to the conditions under which research takes place is surprising given that the Best Practices for Mixed Methods Research in the Health Sciences (Creswell, Klassen, Plano Clark, & Smith, 2011) defines mixed methods research as focusing on “research questions that call for real-life contextual understandings” (p. 4) and identifies mixed methods research as being useful for integrating data across different levels of a system. An increasing emphasis on research complexities is evidenced in recent guides to the mixed methods field calling attention to the nature of and influences to the various dynamic and interrelated contexts in which mixed methods research takes place. An illustrative example of recent efforts to recognize research complexity and provide practical guidance involves a socio-ecological model advanced by Plano Clark and Ivanova (2016). This model represents a nested systems perspective of the research conditions and “explains the interwoven dynamic relationships that exist between various individual and environmental factors, such as personal, interpersonal, and organizational, community, and societal contexts” (p. 14). In so doing, the community of mixed methods researchers are beginning to grasp the effects that differing conditions of complexity have on research efforts and to harness the opportunities afforded by a complexity lens for addressing the demand for more complexity-sensitive research practices.

To transform our mixed methods research practices to be more complexity-sensitive to the unique needs of the research, it is necessary for researchers to differentiate conditions of complexity that might appear similar at first glance to allow the tailoring of an approach over time. I advance a focus on transforming our mixed methods research to be more complexity-sensitive because under conditions of complexity, research problems, contexts, teams, and designs can no longer be considered stable and isolated from their surroundings. Instead, new sensitivities in our practices enable more timely and appropriate mixed methods researchers’ responses to the evolving conditions influenced by dynamic contextual influence. In so doing, a complexity-sensitive mixed methods research approach bridges the gap between the assumptions underlying current mixed methods research practices and the realities encountered by mixed methods researchers under conditions of complexity. The current article, providing the groundwork towards realizing the distinct niche occupied by a complexity-sensitive approach to mixed methods research practices, has three purposes: First, I advance a practical framework for diagnosing four interrelated dimensions of complexity in mixed methods research. Second, I apply a complexity lens to inform transformations to some mixed methods practices under conditions of complexity. Finally, I highlight the important implications of a complexity-sensitive approach to mixed methods research for enhancing research capacity under conditions of complexity.

**Diagnose Dimensions of Complexity in Mixed Methods Research**

That mixed methods researchers grapple with conditions of complexity is not unique. All research takes place under conditions of complexity, and great variability exists in research conditions. We have long recognized the complexity inherent to research as a pursuit—the processes involved in research draw upon expertise across many areas of competency. Yet, we are only beginning to recognize the dimensions of complexity in our mixed methods research pursuits. Only once we understand the variations among research dimensions of complexity are we better positioned to transform our mixed methods research practices to be more complexity-sensitive.
In the following section, I advance a practical framework for diagnosing four interrelated dimensions of complexity in mixed methods research: features of mixed methods research problems, diversity of mixed methods research teams, changeability of research contexts, and fixedness of mixed methods research designs. In addition, some overlap is implied: these dimensions should not be considered static but rather influenced by new research and evolving circumstances.

**Complexity Dimension 1: Features of Mixed Methods Research Problems**

Why is the mixed methods research being pursued? Most researchers agree that the research problem is central to deciding when mixed methods research is a suitable approach (e.g., Creswell, 2015; Plano Clark & Badii, 2010). My definition of mixed methods research requires the integration of both types of data—quantitative and qualitative—and assumes that the collective contribution mitigates inherent weaknesses in either type of data. To that end, I consider qualitative and quantitative data to contribute differently to addressing a research problem: whereas qualitative data provide more detailed understandings, quantitative data provide more generalized understandings. Integrating both types of data to address a mixed methods problem has the unique potential to offset the strengths and limitations of one with the other. I make a case for mixed methods research by referring to the background influences to the research problem that highlight the need for integration in order to generate insights that were inaccessible by either qualitative or quantitative data alone.

Research problems define the focus of the study. Research problems that are considered to be highly complex feature not-yet-known needs for integration of qualitative and quantitative data, and so the mixing purposes are not yet clearly defined and may be multiple—often because there is a dearth of relevant background information and guiding literature. Low complexity mixed methods research problems may be multifaceted and important; yet, they are also characterized as having a clearly defined mixing purpose and known solutions because of the high degree of consensus related to the issue being explored and the approach to its study. Those beginning to unpack the complexity in mixed methods research problems are guided to consider three characteristics: clarity of background dynamics, the definition of integration purpose, and certainty of the study outcomes. It should be noted that few research problems can easily be categorized as low, moderate, or high complexity. Most problems represent some mixing of characteristics; however, identifying the unique mix of characteristics can inform mixed methods research practices under conditions of complexity. The following questions can help assess the level of complexity for mixed methods research problems:

- What is known about the background for the mixed methods research problem? Research problems involving topics and societal issues that are well-established and considered stable in the literature are considered less complex compared with wicked problems that are considered more complex.
- What is known about the need to integrate qualitative and quantitative data from the background information? Problems, wherein the mixing purpose(s) are not yet known or cannot be easily categorized within the existing typologies, are considered to be more complex.
- What is known about the intended mixed methods study outcomes? Research problems that can be addressed by drawing upon the identifiable expertise and established research practices are considered to be less complex, whereas research problems with uncertain outcomes are more complex.

**Complexity Dimension 2: Diversity of Mixed Methods Research Teams**

Who is involved in undertaking the mixed methods research? Research is a social activity. Describing the people involved in the study team is essential because mixed methods research teams are increasingly becoming recognized as an optimal configuration for addressing mixed methods research problems. The usefulness of teams for generating innovative insights greater than the sum of what would have been individually accessible is tempered by the inherent challenges and social influences when bringing together a team with differing perspectives, experiences, and assumptions (Bryman, 2006; Curry et al., 2012). To that end, I consider the diversity among team members to be a critical component for integrative interactions necessary for addressing wicked mixed methods research problems. I make a case for a mixed methods research team by identifying the necessary expertise for the study, explaining the backgrounds of individual team members, and developing the capacity for collaboration within the diverse team that would not have been possible by individuals on their own.

Research teams determine the research capacity of the study. A research team involving numerous members who are geographical, disciplinarily, and methodologically diverse and have expectations of intense collaborations but yet guided by vague role definitions is considered more complex than, for example, a doctoral research
committee involving the student, supervisor/chair, and two committee members with highly defined roles following a pyramid hierarchy with the supervisor/chair at the top and the doctoral student at the bottom, with committee members somewhere in between where their interactions are often characterized by low levels of collaboration. Discovering the sources of diversity in mixed methods research teams requires consideration of three characteristics: clarity of social dynamics, description of research contributions, and level of team collaborations. It should be noted that few research teams can easily be categorized as having low, moderate, or high complexity. Most teams represent some mixing of characteristics; however, identifying the unique mix of characteristics can inform mixed methods research practices under conditions of complexity. The following questions can help assess the level of complexity in mixed methods research teams:

- What is known about the commonalities and differences among background and expertise of individual mixed methods research team members? In general, team members who are diverse in terms of background experiences and disciplinary and methodological expertise have more complex social dynamics among teams.
- What is known about how many members are on the mixed methods research team and how are their roles defined? Typically, research with a larger number of team members with little role definition is more complex than that with smaller teams who have highly defined roles.
- What is known about the expectations of mixed methods research team members regarding how they will interact and contribute as a collective? The more a team is intended to develop shared understandings and collaborate, the more complex the interactions among research members becomes.

**Complexity Dimension 3: Changeability of Mixed Methods Research Contexts**

Where does the mixed methods research take place? The setting for a study involves describing the physical location as well as the larger societal, historical, political, economic, and social contexts in which the study is situated. Contextual study boundaries were at one time limited to the local environment in which the research took place—such as the site population and history. Although the local environment remains an important consideration, we now recognize the influence that personal and societal environments in which research is situated have on the local research context, and vice versa (Plano Clark & Ivankova, 2016). To that end, I consider the interplay of individuals to shape the larger systems of which they interact at the same time that the larger system influences the behavior of the individual. Similar to Koopmans (2017), I make a case for the mixed methods research context by identifying influences within and across the personal, local, and societal contexts.

Research contexts influence study designs and procedures. Highly complex research contexts may involve geographically dispersed research sites, diverse participant demographics, and multiple organizational environments whose functions might be overlapping. Low complexity research contexts may involve multiple research sites; yet, they may also be characterized as having similar geographical locations and participant demographics with well-defined functions for their organizations. Diagnosing the sources of changeability in mixed methods research teams requires consideration of three characteristics: clarity of contextual dynamics, the extent of participant dynamics, and delineation of organizational functions. It should be noted that few research contexts can easily be categorized as low, moderate, or high complexity. Most contexts represent some mixing of characteristics; however, identifying the unique mix of characteristics can inform mixed methods research practices under conditions of complexity. Some questions can help researchers begin to identify the unique characteristics of their research contexts, including the following:

- What is known about the scale of the mixed methods research and geographical boundaries? In general, research with a larger number of participants and sites that are geographically dispersed tend to be more complex.
- What is known about the diversity of the target population for the mixed methods research? The more diverse the target population is in terms of cultural, social, and economic variables, the more complex it is.
- What is known about the organizational structures within the mixed methods research? Research that involves different agencies in terms of funding, programming, and oversight might be more complex than working with a particular organizational structure, for example, an intergovernmental committee.

**Complexity Dimension 4: Fixedness of Mixed Methods Research Designs**

What guides the research procedures? Intent plays an important role in selecting a mixed methods research design and should be seen as “emerging in a study and not solidity fixed in place” (Creswell, 2015, p. 35). Indeed, Hunter and Brewer (2015) ascertain that designs can be considered the outcome of prescriptive planning before the study is undertaken or can be understood by examining the patterns at the conclusion of the study. To that
end, I consider predetermined and emergent designs to offer different approaches; yet, common to both is the ability to respond to changing conditions. I make a case for the mixed methods research design by identifying the details for each point of interface related to the data sources: rigorous data collection, analysis, and integration procedures, and the mixing purposes.

Research designs delineate the data procedures for a study. High complexity research designs involve a lack of clarity in duration and resources and are emergent in nature because of low agreement in the literature guiding how to proceed. In contrast, low complexity in research designs involves an existing design typology and predetermined mixing purposes and procedures. Assessing the extent of design fixedness involves consideration of three characteristics: clarity of logistical details, the extent of typology fit, and feasibility of rigorous procedures. It should be noted that few research designs can easily be categorized as low, moderate, or high complexity. Most designs represent some mixing of characteristics; however, identifying the unique mix of characteristics can inform mixed methods research practices under conditions of complexity. The following questions can help assess the level of complexity for a mixed methods research design:

- What is known about the combinations of anticipated data logistics needed to adequately address the mixed methods research problem? The more we know about the procedures for addressing the research problem, the more we can predetermine the study design, and the research is considered to be less complex than topics that we know little about or how to study them.
- What is known about the research designs and fit with an existing design typology? Research involving existing typologies that are well established and considered stable in the literature are considered less complex.
- What is known about the anticipated timeframe and available resources for the mixed methods research? In general, research without clear start and end dates, and with ill-defined resources, tend to be more complex than are those with clear study durations and anticipated resources.

**Apply Complexity Science Principles to Mixed Methods Research**

I am continually surprised by the lack of accessible and practical guidance for researchers working under conditions of complexity because of the need that I observe. My understandings of dilemmas faced by researchers are informed by accounts from my students and colleagues as well as by my own experiences as a mixed methods researcher and my reading of relevant literature. Providing guidance for mitigating these dilemmas is essential, because others might only realize the challenges faced by mixed methods researchers once they are involved in initiating, planning, and implementing a study under varying conditions of complexity. It should now be apparent that the use of mixed methods research to tackle wicked research problems requires researchers to transform their practices.

A mixed methods research approach that takes complexity into account offers a more accurate view of the reality in which we operate as researchers. The principles of complexity science as a theoretical framework guide mixed methods researchers in making sense of what has happened (past experiences), what is happening (present occurrences), and what might happen (future possibilities). In so doing, complexity science affords a new way of interpreting the world around us because it offers a way of going beyond the limits of reductionism, because it understands that much of the world is not machine-like and comprehensible through a cataloguing of its parts; but consists instead of organic and holistic systems that are difficult to comprehend by traditional scientific analysis. (Lewin, 1999, p. x)

Thus, complexity provides an innovative perspective to inform our work as mixed methods researchers. The consequences of mismatches between the assumptions underlying our mixed methods research practices and the realities that we face as researchers cause great concern. What is becoming increasingly evident is that, although few research conditions can be conceived of as stable, many of our guiding practices as mixed methods researchers are based on the assumption of stability, and our efforts are focused on reducing the complexity inherent to research contexts. Over the last decade, I have sought to capitalize on the four opportunities for mixed methods researchers under conditions of complexity by applying a complexity lens to inform our practices. My intent is not for us to get lost in the theory that underpins complexity science but rather to demonstrate how the principles of complexity science provide the theoretical foundation for realizing a complexity-sensitive mixed methods research approach because the theory offers possibilities “of looking differently at existing scholarly problems, including the wicked ones” (Koopmans, 2017, p. 17). A complexity lens is useful for informing how we can go about transforming our current mixed methods research practices and provide much-needed inspiration for developing appropriate responses under conditions of complexity.
Complexity science aims to describe the behavior of systems and, in so doing, distinguishes complex from complicated systems and highlights emergence as the primary characteristic of a complex adaptive system (Holland, 2014). Complex adaptive systems are phenomena that defy simplistic analyses of cause and effect and have the capacity to adapt to contextual changes (Weaver, 1948). Complex means composed of many parts that are joined and twisted together; adaptive refers to the fact that all living systems dynamically adapt to their constantly changing environments as they strive to survive and thrive; and system denotes that everything is interconnected and interdependent. Because mixed methods research is influenced by a large number of interacting and interrelated contextual components for which there is no central control—and yet team members have the capacity to adapt to new conditions—it can be considered to represent a non-linear and complex adaptive system. We now recognize that non-linear and complex adaptive systems offer an authentic way to understand systems involving people working under conditions of varying complexity because people have the capacity to emerge, evolve, and thrive (Lewin, 1999). This means that mixed methods research practices predicated on linear thinking, control, predictability, and stability are limited in their usefulness because the world in which we operate as researchers is simply too complex. Only once we understand how our practices are transformed by complexity science are we better positioned for realizing the opportunities for mixed methods researchers under conditions of complexity. In the following section, for each of the four complexity-sensitive mixed methods research practices, I describe how it can be approached differently using a complexity lens and explain the theoretical foundation underpinning the related principle of complexity science (see also Figure 1 for a summary).

**Identify a Wicked Research Problem to Focus the Study**

The opportunity for mixed methods researchers tackling wicked research problems is to generate yet-to-be-known integrated insights. Only by assuming non-linearity in the mixed methods research process and uncertainty in the mixed methods research outcomes can we begin to address wicked research problems. This is because our understanding of the research problem is evolving throughout the research process and we cannot predict the effects from yet-to-come experiences or emerging literature that will influence its evolution—something that might be initially perceived as non-significant might have sizable effects over time. The resulting, yet-to-be discovered understandings of the wicked research problem may, in turn, inform new mixing purposes and designs for going about the study.

As I consider tackling wicked research problems to search for integrated insights that are not yet known, I embrace one of the key characteristics of complex adaptive systems: “small changes can lead to large effects” (Lewin, 1999, p. 203). Indeed, non-linear relationships are known to be distinctive, and changes are disproportionate between source and consequence (Byrne & Callaghan, 2014). Thus, researchers are deemed as developing greater comfort with tackling wicked mixed methods research problems because they have an increased understanding that from the edge of chaos and the unknown comes new possibilities for innovation.

**Seek a Diverse Research Team to Involve in the Study**

The opportunity for mixed methods researchers forming diverse research teams is to develop yet-to-be-realized emergence capacity. Only through creating conditions for self-organization (also known as emergence) can we develop the capacity for a mixed methods research team to accommodate the products of their interactions. This is because the collective work drawing on team members’ diverse expertise and experiences generate understandings that would not have been otherwise accessible. The resulting perspective creates opportunities for developing new ways of collaborating among team members based on yet-to-be-known understandings of their disciplinary, experiential, and methodological study contributions.

As I identify members and facilitate team development, I have incorporated one of the key characteristics of complex adaptive systems: that “the source of emergence is the interaction among agents who mutually affect one another” (Lewin, 1999, p. 202). Indeed, emergence means that the properties of the whole cannot be accounted for by its components (Byrne & Callaghan, 2014). Thus, researchers are deemed as developing a greater capacity for emergence within a diverse team because of an increased understanding that from the negotiation of differences and the development of mutual relations comes new possibilities for innovation.
Diagnose an Interrelated Research Context in Which to Situate the Study

The opportunity for mixed methods researchers bounding the interrelated research contexts is to examine yet-to-be-determined system behaviors. Only by considering our initial understandings of the research conditions are we able to distinguish among differing conditions initially perceived as similar. This is because it reminded me of the need to assume unpredictability in the mixed methods research contexts and dynamic and interconnected influences surrounding mixed methods research. This unique perspective opens new opportunities for understanding the contextual influences within and across the personal, local, and societal contexts of a mixed methods research study.

As I have expanded the contextual research boundaries, I have come to appreciate one of the key characteristics of complex adaptive systems: that “greater diversity of agents in a system leads to richer emergent patterns” (Lewin, 1999, p. 203). Indeed, the interplay of individuals shaping the system and vice versa are known to occur in complex adaptive systems (Koopmans, 2017). Thus, researchers are deemed as developing a more accurate view of the mixed methods research contexts because with increased understanding of the changeable nature comes new possibilities for innovation.

Describe an Agile Research Design to Guide the Study

The opportunity for mixed methods researchers describing agile research designs is to advocate for data procedures that are yet to be specified. Only by assuming assimilation by those involved in the mixed methods research can we embed adaptability in the logistics in the mixed methods research designs. This is because our understanding of the interplay among individuals involved in the study and between those individuals and the systems in which they are situated. This unique perspective opens possibilities for research designs that are emergent throughout the study and less predetermined than typologies.

As I have accommodated dynamic influences, I have adapted to one of the key characteristics of complex adaptive systems: “emergence is certain, but there is no certainty in what it will be” (Lewin, 1999, p. 203). Indeed, adaptations to design logistics are known to occur, and designs can be described by examining the procedures undertaken at the conclusion of the study (Hunter & Brewer, 2015). Thus, researchers are deemed as developing more appropriate mixed methods research procedures because of their increased understanding that from assimilation comes new possibilities for innovation.

Implications for a Complexity-Sensitive Mixed Methods Research Approach

There are both practical and theoretical implications for a complexity-sensitive approach to mixed methods research. First, a complexity-sensitive approach has the strong potential for enhancing mixed methods research capacity under conditions of complexity. This is because a complexity-sensitive approach is especially useful in situations where the predictability of research outcomes is low; it involves emergent designs with shifting procedures rather than predetermined designs with fixed procedures. Second, a complexity-sensitive approach to mixed methods research cannot be thought of as a set of steps to be followed. Rather, think of it as a mindset that optimizes efforts as researchers working in complex conditions. This means embracing change. A practices-based approach is intentional because it implies the need to adapt to the unique research conditions that each study presents. Researchers might find that they focus on particular practices more often than others. This is to be expected. A practices-based approach is contrasted with prescriptive and progressive frameworks which assume that each step is completed before going on to the next. Instead, complexity-sensitive practices assume that our research process will return to steps throughout the study to provide direction when planning, implementing and communicating about the study. Third, a complexity-sensitive approach requires each practice be interpreted and adapted to the unique needs of the researcher in each research study. How a mixed methods researcher uses the practices will depend on a variety of factors, including the particular stage of the study and the specific context of the study. Of key importance is that study proposals make explicit our understandings of the dimensions of complexity that are specific to our study and that we describe in our study reports how we responded to the conditions of complexity. Taken together, a complexity-sensitive approach can guide researchers to identify, monitor, and respond to conditions of complexity. Because of the close interrelatedness of these practices, it is likely that a mixed methods researcher will be engaged in several of them concomitantly. Finally, a complexity-sensitive approach begins to address the practice gap for working under conditions of complexity. In so doing, it provides guidance for developing teams and diagnosing contexts in addition to innovating designs.
and addressing wicked problems. Of course, this is just an initial understanding of the curious case of complexity within mixed methods research and the development of complexity-sensitive mixed methods research practices.

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<td>Generate yet-to-be-known integrated insights for wicked problems</td>
<td>Non-linearity and uncertain outcomes</td>
<td>Small inputs can lead to dramatically large consequences</td>
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<td>Seek a diverse research team to involve in the study</td>
<td>Develop yet-to-be-realized emergence capacity for diverse teams</td>
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Figure 1. Aligning opportunities for mixed methods researchers with a theoretical foundation in complexity science.

Conclusion and Future Directions

The field of mixed methods research continues to evolve, with some of its attention focused on combining quantitative and qualitative methods in systematic and innovative ways under conditions of complexity. Recent discussions have established the field of mixed methods as well positioned to contribute to the wicked problems that occur in the complex world which we inhabit (Mertens et al., 2016b); yet, there lacks guiding research practices for conditions of complexity. Let us come together and imagine a future where mixed methods researchers are skilled at flexibly positioning their research efforts within varying conditions of complexity. A complexity-sensitive mixed methods research approach meets the ethical standards, research competencies, and guiding principles established by the field of mixed methods research. The guiding principles for complexity-sensitive mixed methods research practices should be considered to be emergent. At this time, they are theoretically based. As our understandings of the application of principles evolve, it is natural that the principles themselves would evolve as well. The next step would be to generate an illustrative example of the principles being applied in real-world mixed methods research. Work is already being undertaken to create empirically based complexity-sensitive mixed methods research practices that could be applied across various conditions of complexity.

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