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DEFINITIONAL ISSUES

PRINCIPAL PURPOSES OF THE CHAPTER

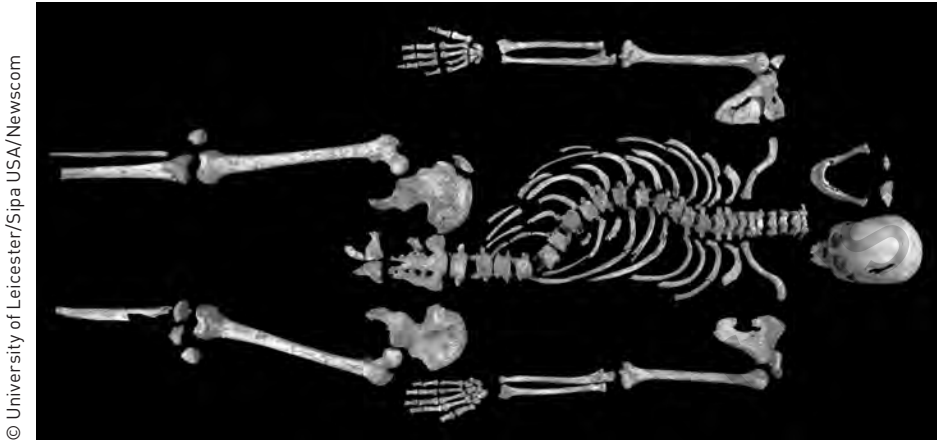
1. To introduce foundational terminology used in the mixed methods literature
2. To review several definitions of mixed methods
3. To present fully integrated mixed methods as the conceptual framework for the book

EXAMPLE FROM THE POPULAR MEDIA: LOCATING THE BONES OF RICHARD III

A team of researchers at the University of Leicester in the United Kingdom made a remarkable discovery in 2012. Struck down in the Battle of Bosworth Field, the bones of one of the monarchs of England, Richard III, had been missing for more than 500 years. Richard III was depicted as a villainous hunchback in the play by Shakespeare by the same name, where he was claimed to have yelled, “My kingdom for my horse!” before he met an ignoble end after a mad dash on foot across the battlefield. Analysis of the skeletal remains in the unmarked grave convincingly identified it as Richard’s because of the pronounced curvature of the spine. He was not a hunchback, as Shakespeare portrayed him, but suffered from a scoliosis, among other ailments. Analysis of the bones revealed that Richard suffered multiple blows that could easily have accounted for his demise.

The team of researchers from the United Kingdom provide a contemporary example of how the use of multiple research methods from a variety of disciplines can unlock a mystery. The search for the bones of the long-lost monarch frustrated generations of scholars and adventurers (see Figure 1.1.). Members of the team of researchers mapped references to the location of the bones found in historical letters, diaries, and newspaper accounts to historical maps of the period and later transposed them to contemporary maps of the area. They then used map regression analysis, a statistical procedure, to pinpoint the location of the unmarked grave. Their strategies

FIGURE 1.1 ■ Discovering the Bones of Richard III: A Contemporary Example of Triangulation for Convergence



proved effective, as the long-missing bones were discovered under a parking lot in the town of Leeds.

Mixed methods researchers would label the procedure used to solve the mystery of the unmarked grave as a stellar example of one of the principal reasons for using mixed methods: to enhance validity through **triangulation**. *Triangulation involves corroboration or verification through multiple data points or multiple types of data about the same phenomenon.* In the case of the discovery of the long-lost skeletal remains, locations identified in historical accounts were converted to quantitative map coordinates for further analysis. It was the triangulation of the data that ultimately led to the discovery of the unmarked grave.

The concept of triangulation is a foundational construct in mixed methods research. It is a concept that illustrates that rather than having entirely distinct methodological assumptions, there are areas of overlap in the philosophical assumptions between qualitative and quantitative research methods. Greene (2007) argued that triangulation provided an “olive branch” in the waning days of the “paradigm wars,” as researchers engaged in heated disputes about the legitimacy of the newly emerging qualitative movement. Greene maintained that the mixed methods movement formally began to emerge in the mid-1980s as qualitative and quantitative researchers found common ground by endorsing the contribution of triangulation to the credibility of research findings.

PURPOSES AND GOALS OF THE CHAPTER

In this chapter, you will be introduced to many of the foundational terms used in the mixed methods literature and that you will find in the glossary. There’s a description of various perspectives about the definition of mixed methods research and a

discussion of different ways to distinguish qualitative and quantitative approaches and methods. The conceptual framework for the book is presented next. The chapter closes by identifying some of the controversies associated with the foundational issues introduced in this chapter.

The goals of the chapter are to

1. review different perspectives about the definition of mixed methods research,
2. distinguish mixed method research from multimethod and quasi-mixed methods research,
3. consider some challenges in distinguishing qualitative and quantitative approaches,
4. describe a mixed method way of thinking as a logic that undergirds mixed method approaches, and
5. acknowledge concerns that are voiced about mixed method approaches.

DIFFERENT PERSPECTIVES ON THE DEFINITION OF MIXED METHODS RESEARCH

The defining characteristics of mixed methods research have continued to evolve since it first emerged as a methodological movement in the late 1980s. While consensus has yet to coalesce about all aspects of the definition, there is general agreement among mixed methods researchers about the core elements of a definition of mixed methods research. This includes the centrality of mixing as a distinguishing feature of mixed methods research and the assumption that it is both a method and a methodology. Diverse viewpoints exist, however, about the paradigmatic foundations of mixed methods as well as about the type and extent of mixing that is required to satisfy a baseline definition.

The definition of mixed methods research supplied by Creswell and Plano Clark in their textbooks (2007, 2011) sidesteps the issue of paradigms but characterizes mixed methods research as having a set of guiding philosophical assumptions and a method where a qualitative and quantitative strand are mixed at some point in the study. According to them,

Mixed method is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixing of qualitative and quantitative approaches in many phases of the research project. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides better understanding of research problems than either approach alone. (Creswell & Plano Clark, 2007, p. 5)

Creswell and Plano Clark's definition situates mixed methods research as both a method and methodology. According to Greene (2008), a **methodology** consists of *a coherent framework of philosophical assumptions, methods, guidelines for practice, and sociopolitical commitments*. A number of philosophical assumptions undergird mixed methods. One of these is that qualitative and quantitative data and qualitative and quantitative methods are not incompatible. A second is that there is added value by the combination of qualitative and quantitative approaches to produce more robust findings. A third is the assumption that the corroboration of multiple types of data or multiple data points (i.e., triangulation) enhances validity. A fourth philosophical assumption undergirding mixed methods is referred to as the **complementarity argument**, which *claims that the use of a combination of methods can offset the weaknesses inherent in any method*. Each of these philosophical assumptions is discussed more thoroughly in the chapter about purposes (Chapter 2).

The definition Creswell and Plano Clark supply also refers to mixed methods as a distinct **method**. A method *consists of a systematic and coherent set of agreed-upon practices and procedures for conducting empirical research*. As a method, their definition stipulates that a study should contain both qualitative and quantitative strands and that these strands are mixed or integrated at some point in the study. As an additional element of methods, Creswell and Plano Clark champion the position that one of the core characteristics of mixed method research is the use of a taxonomy of research designs for planning and conducting a study. As will be discussed more thoroughly in Chapter 4, not everyone shares their enthusiasm for using a prescribed set of models or designs as a guide for designing and executing mixed methods studies.

THE CENTRALITY OF MIXING TO THE DEFINITION OF MIXED METHODS RESEARCH

While agreement has yet to coalesce about each and every aspect of the definition of mixed methods research, there is little disagreement about the centrality of mixing or the integration of qualitative data or strands as being a defining element of mixed methods research. The term *mixing* is part of the specialized language of mixed methods researchers. **Mixing** *is the linking, merging, or embedding of qualitative and quantitative strands of a mixed methods study*. It is not present when the strands of mixed methods study are kept parallel or distinct.

Creswell and Tashakkori (2007) share the following view about the centrality of mixing to the definition of mixed methods research: "Mixed methods research is simply more than reporting two distinct strands of quantitative and qualitative research; these studies must also integrate, link or connect these strands in some way" (p. 108). Teddlie and Tashakkori (2009) label a study containing *both a qualitative and quantitative strand but lacking any point of interface between the two* as **quasi-mixed methods**.

The centrality of mixing to the definition of mixed methods research is one fixture that distinguishes it from **multimethod studies**, which *occur when more than one qualitative approach or more than one quantitative approach is used in a single study*. This might be the case, for example, when two deductive (hypothesis-testing) or two inductive (hypothesis-generating) approaches to the analysis are used. Multimethod research is not restricted to combining qualitative and quantitative approaches (Hunter & Brewer, 2015). Yin (2006) maintained that the more mixing that occurs across phases of the research process, the more easily the research can be distinguished from what should otherwise be labeled as multimethod.

DISTINGUISHING QUALITATIVE AND QUANTITATIVE APPROACHES

It is surprisingly difficult to pinpoint a workable distinction between qualitative and quantitative research that holds up under scrutiny. By *workable*, I mean useful in determining if a study meets at least a minimal expectation to warrant the use of the label *mixed methods*, regardless of the label affixed to it by its authors. Most markers put forward to distinguish the two do not hold up in practice. While frustration with identifying ways to distinguish the two is so powerful that it has led more than one author to dismiss the distinction as meaningless (e.g., Maxwell, 2010; Newman & Hitchcock, 2011; Ridenour & Newman, 2008; Sale, Lohfeld, & Brazil, 2002), it is so embedded in the rhetoric and practice of day-to-day work of social scientists that it cannot be waved off for philosophical reasons.

Greene (2007) proposed a concrete rule of thumb for distinguishing between qualitative and quantitative approaches that requires little judgment from the reader. She took the position that a principal way to distinguish is during data collection: The data in qualitative research are words; in quantitative research, the data are numbers. Some take this straightforward dichotomy one step further and distinguish quantitative research by its use of statistical procedures and quantification and qualitative research as the absence of that.

Bryman (2004, p. 448) agreed that the word–number distinction is the most basic way to distinguish qualitative and quantitative research but acknowledged that the distinction is not a clean-cut one because it is simply not accurate to characterize qualitative research as being devoid of quantification. Bryman observed, “There is clearly some confusion concerning whether the quantification of qualitative, unstructured data is indicative of a quantitative or a qualitative approach” (2004, p. 100).

Many other strategies have been used to distinguish quantitative and qualitative approaches. Focusing on the design phase of a research project, Ercikan and Roth (2006), for example, argued that quantitative and qualitative research tends to be associated with different types of purposes and research questions. In their perspective, both methods can be used to answer descriptive questions. The qualitative strand is more likely than the quantitative strand to be used to answer *what* and *how* questions about a process.

Some of what can be seen in the published examples of mixed methods research demonstrates the complexity of using a simple dichotomy such as words versus numbers to distinguish qualitative and quantitative approaches. Nowhere is this more evident than in the fairly sizable body of content analyses that have examined the use of mixed methods in all kinds of different disciplinary areas (e.g., Hart, Smith, Swars, & Smith, 2009; Hauser, 2013; Powell, Mihalas, Onwuegbuzie, & Daley, 2008). An example of how the word–number dichotomy does not hold up in practice is evident in a recent content analysis of research articles in distance education by Hauser (2013). Hauser was reflexive about the struggle she encountered when she tried to classify the methods used in each article by applying the tried and true qualitative–quantitative distinction of words and numbers. She observed,

In [my] review of the literature for this study, [I] found articles that stated that they were quantitative but did not perform statistical analysis and reported no statistical results. [I] also found articles that were declared to be qualitative and collected data using open-ended questions but reported results using statistical methods only and did not include any qualitative analysis or report data in a descriptive format. (p. 156)

The quantification of qualitative data accounted for a good deal of the struggle Hauser experienced in discerning the differences between a qualitative and quantitative approach. She simplified matters by reducing it to a matter of quantification. She categorized any method that reported statistical results as quantitative and only considered the study to have a qualitative phase if the qualitative data were reported without quantification. She applied the mixed methods label without any expectation that the two types of results could be integrated.

QUALITATIVE AND QUANTITATIVE APPROACHES AS DIFFERENT ANALYTICAL STRATEGIES

When I am trying to determine if a study described in a publication meets my minimal definition of mixed methods research, I find it most helpful to first assess if the analytical procedures in a mixed method publication include a deductive and an inductive element. Although this viewpoint is not without its detractors, I consider a deductive and an inductive component to be the baseline, minimal standard to warrant the designation as mixed methods. The two approaches to analysis are sometimes distinguished as moving from the general to the specific (deductive) or the specific to the general (inductive). The borderline between the two can be surprisingly murky.

I find that many graduate students have trouble escaping their methodological socialization and incorporating an inductive or emergent approach that is free as it is humanely possible to be of preconceptions. Similarly, when analyzing a pool of

articles flagged as mixed methods, it is not uncommon to discover that many authors approached the analysis of both types of data deductively. A deductive analytical strategy can be framed to test the constructs or relationship proposed in a theoretical framework. The predilection to a deductive mindset may explain why researchers applying the tools of content analyses to a body of mixed methods articles often conclude that the quantitative strand was given priority.

Although this foundational assumption is often violated, inductive reasoning is most often associated with an emergent or qualitative approach. In this approach, a researcher approaches his or her data with an open mind and without imposing a comprehensive theoretical framework. An inductive approach generates hypotheses rather than confirms them. Inductive analytical strategies are much more likely to be missing from a mixed methods study than deductive ones. It is my experience that the emergent strand of a mixed methods study is most likely to produce unexpected findings. It invites further exploration of the unexpected and thus, I argue, is most likely to produce innovative insight.

The description of the research strategies used to pinpoint the location of the bones of the impulsive king illustrates that like many things methodological, the distinction between the deductive and inductive phases of a mixed methods project is not always obvious. The emergent or inductive phase occurred as the researchers analyzed a variety of written narratives identifying the location of where the king had been unceremoniously dumped in an unmarked grave after defeat in battle. The accounts were so contradictory and were relative to such a variety of landmarks that repeated efforts by prior teams had not been successful. The quantitative or deductive phase of the research occurred as the team of researchers linked the accounts in credible historical documents with map coordinates. Mixed methods researchers refer to the process of turning words into numbers as *data transformation*. In the case of the missing king, a statistical procedure subsequently was applied to the transformed data to finally pinpoint the exact location of the skeletal remains.

CONCEPTUALIZING QUALITATIVE AND QUANTITATIVE APPROACHES ON A CONTINUUM

Teddlie and Tashakkori (2009) were not the first to conceptualize qualitative and quantitative approaches not as polar opposites but as a continuum with points that overlap at the center. The extreme points on the continuum might be taken to reflect a “purist” stance. The depiction of qualitative and quantitative approaches intersecting at the center of a methodological continuum communicates that the boundaries between the two approaches are not impervious. It provides a counterpoint to the argument taken by purists that qualitative and quantitative approaches are so different that intermingling the two is impossible. The notion of a continuum highlights that there is significant variability in the paradigmatic assumptions of researchers using

TABLE 1.1 ■ Potential Contributions of Qualitative and Quantitative Approaches to a Mixed Methods Study by Phase

Phases of the Research Process	Quantitative	Qualitative
Design	Variable oriented (offers breadth) Addresses <i>what</i> and <i>why</i> questions	Case oriented (offers depth) Process oriented Can also address <i>how</i> questions
Data collection	Numbers	Words
Sampling	Allows for generalizability	Can pursue negative case or exemplary case
Analysis	Deductive Confirmatory Used to test theory	Context bound Inductive and sometimes emergent Exploratory Used to produce or modify theory
Inferences	Interpretations that extend the data	Interpretations that extend the data

different types of either qualitative or quantitative approaches. Purists at either end of the continuum are the groups of researchers most likely to find the idea of integrating qualitative and quantitative approaches as an anathema to their philosophical standpoint.

Rather than reinforcing the idea that qualitative and quantitative are starkly different approaches, I have organized Table 1.1. to illustrate the potential contribution of each to constructing a well-designed mixed method study. Table 1.1 lists the potential contribution of combining different aspects of qualitative and quantitative approaches at each phase of the research process. I put a different spin on the complementarity argument in this table. While it is often argued that one reason to use mixed methods is to offset the weaknesses of each method, I have set up the table in such a way as to emphasize the potential gains of using both qualitative and quantitative approaches in a single study.

Table 1.1 offers some ideas about how a researcher might borrow strengths from each approach to build a stronger study. The table is not meant to represent a menu or to imply that it is likely that, even at the design stage, a researcher should or could incorporate all of the listed elements. It does endorse the idea that some of the strengths of each approach can be incorporated in a well-designed mixed methods study.

Quantitative and qualitative approaches are each acknowledged as having their own distinct baggage of weaknesses. Qualitative research, for example, is often criticized as if the small, nonrepresentative sample means the results are anecdotal. Quantitative research, on the other hand, may be questioned for its inability to explain why or how an intervention succeeded or failed or why differences in outcomes between

groups occurred. In response to these criticisms, in the process of laying out the plans for a mixed methods research project, a researcher might choose, for example, to bolster the representativeness of the sample used in the qualitative strand of a study by employing some quantitative sampling strategies and by ensuring that data from some members of the sample are used in both the qualitative and quantitative strands.

Even as I have found over the years that the inductive/deductive distinction is a workable baseline for distinguishing qualitative and quantitative strands of a mixed methods study and appreciate its emphasis on the analytical phases of a project, I recognize that it might well be argued that it is too simplistic to distinguish qualitative and quantitative methods by concentrating on a single phase of a study. This is one of several areas where there is a considerable gap between academic rhetoric and actual practice.

Quite a number of authors have used relatively strong language to voice their objections about the simplistic assumption that qualitative and quantitative methods are distinct and always readily distinguishable in practice. Ridenour and Newman (2008) labeled it a “false dichotomy.” Ercikan and Roth (2006) pointedly observed, “Polarization of research into qualitative and quantitative is neither meaningful nor reflective of the realities of research” (p. 20). A British researcher, Bryman (2004), took a similarly forceful stand when he wrote, “We should be wary of assuming that in writing and talking about quantitative and qualitative research, we are referring to two absolutely divergent and inconsistent research strategies” (p. 446). Creswell (2011) called the two methods “a binary distinction that doesn’t hold in practice” (p. 272).

MIXED METHODS AS A LOGIC OF INQUIRY

Two influential academics, Maxwell (2004, 2010) and Small (2011), are among those who refrain from using the term *method* to distinguish quantitative and qualitative research and argue that it is too simplistic to distinguish them by methods alone. This is consistent with the views of an early adapter of mixed methods, Jennifer C. Greene (2007), who argued that mixed methods are not simply the combination of methods and types of data but a different way of knowing or making sense of the world. Small (2011) used the phrases “ways of knowing” and “logic of inquiry” to characterize a dialectical stance.

Greene (2007) coined the expression “a mixed method way of thinking” to refer to a dialectical way of thinking or mindset that deliberately engages complexity and multiplistic mental models. This is a perspective shared by interdisciplinary researchers who begin a project with a mindset that the disciplines will introduce different perspectives. Greene’s mixed method way of thinking involves a philosophical mindset along with a valuing of diverse voices, which probably emerges from Greene’s involvement throughout her career in issues of social justice and the evaluation of social programs designed to promote equity as well as her axiological commitment to respecting diverse viewpoints.

Johnson, Onwuegbuzie, and Turner (2007) endorse the view of mixed methods as an approach to knowledge that deliberately sets out to consider multiple viewpoints. This axiological commitment is evident in Greene’s position: “A mixed methods way

of thinking aspires to better understand complex social phenomenon by intentionally including multiple ways of knowing and valuing and by respectfully valuing differences” (2007, p. 17). The view of reality as multiple is part of a paradigmatic view about the nature of reality.

Another way to conceptualize Greene’s mixed method way of thinking is a holistic Gestalt that frames an entire research project from the first glimmer of an idea through to its final phase of execution and delivery. That is quite different from the practical reality that many researchers come to use mixed methods without much forethought but as the result of a search for a research approach that might explain unexpected or contradictory results or the failure of participants in a funded project or evaluation to achieve the desired outcomes or gains.

Greene’s dialectical stance about mixed methods is about the deliberate engagement of paradox and difference. It is what I am calling a *logic of inquiry*. She positions it as being at odds with one of the principal justifications that has been put forward for using mixed methods, which is to enhance the credibility of results by triangulating multiple sources of different kinds of data. Rather than privileging convergence, consensus, and corroboration, Greene’s position places equal priority on divergence, dissonance, and contradiction. This position shares with the scientific method a value awarded to weighing multiple competing hypotheses. At the same time, it recognizes the value-added that emerges from confirming results across settings and with multiple types of data.

Evaluation and Mixed Methods

Mixed method approaches to evaluation are a case in point of how a logic of inquiry can inform all phases of the design and execution of a research project. **Evaluation research is focused on program development. It “involves the triangulation of qualitative and quantitative methods to examine acceptability, integrity, and effectiveness of intervention methods as both a formative and summative process”** (Nastasi et al., 2007, p. 166). Data gathering during the formative phases of an evaluation is geared to find ways to improve the effectiveness of the intervention or program. Summative data provides evidence of gains or outcomes that measure the effectiveness of the intervention.

Evaluations are meant first and foremost to be useful and to improve the effectiveness of the implementation of a new program in a specific context. Their commitment to engage different viewpoints makes them highly compatible with a mixed method way of thinking. Despite their usefulness, reports generated from an evaluation often do not see the light of day or reach a wide audience because they are so context specific.

CONCEPTUAL FRAMEWORK—FULLY INTEGRATED MIXED METHODS RESEARCH

As with Greene’s mixed method way of thinking, the conceptual framework that is woven throughout this book is presented as a logic of inquiry. I distinguish it from a paradigm because it does not explicitly address assumptions about the nature of

reality (i.e., ontology) or the nature of knowledge and how it is constructed (i.e., epistemology). It is an overriding mindset that finds the practice of keeping the qualitative and quantitative strands as parallel but not converging unthinkable. It provides a way of thinking about mixed methods research that is not a prescriptive model for how the research should be conducted. My conceptual framework places equal priority on the qualitative and quantitative strands. As compared to Greene's way of framing mixed methods research, my conceptual framework shifts the emphasis on exploring contradiction and paradox out of the center.

I extend Teddlie and Tashakkori's (2009) expression, **fully integrated mixed methods research**, to refer to an overall Gestalt or holistic perspective that weaves throughout the phases of a research project. Teddlie and Tashakkori defined this as "a family of mixed methods designs in which mixing occurs in an interactive manner at all stages of the study" (2009, p. 335). I define it as *an approach to mixed methods research where there is the intention to mix or integrate the qualitative and quantitative strands of study throughout each of the stages or phases of the research process*. That means that strategies are used to weave together qualitative and quantitative strategies throughout each of the five **phases** or **stages** of a study (*the steps in the process of completing a research study: planning and design, data collection, sampling, analysis, and drawing inferences*). This involves sustained reflexivity about the contribution of both the qualitative and quantitative strands of a study. A commitment to this type of perspective is based on the belief that isolating a mixed methods way of thinking to one stage of the research process does not optimize the potential value-added of mixed methods.

The approach to fully integrated mixed methods research as a logic of inquiry places qualitative and quantitative approaches on equal footing as different but equally legitimate ways of knowing and understanding complex social phenomenon. One of the challenges researchers face when using mixed methods is to maintain, rather than sidestep, the differences between accepted philosophical assumptions and the procedures of each qualitative and quantitative approach.

The value-added of a fully integrated approach to mixed methods lies primarily in the potential of integrating or mixing the qualitative and quantitative strands, including the tenacious pursuit of differences in interpretation that arise during the qualitative and quantitative analysis. My approach in this textbook is to identify strategies that can be used to facilitate the integration of the qualitative and quantitative strands throughout the research process. As this is part of the logic of inquiry I present, my approach is both philosophical and practical.

THE ARCHITECTURAL ARCH AS A METAPHOR

I have found it helpful to visualize my conceptual framework through the metaphor of an architectural arch and to use the keystone that appears at the apex of ideal arches to represent **inferences**. In mixed methods, these are *conclusions or interpretations drawn from the results of the analysis in the quantitative, qualitative, and mixing strands*.

Through conversations with engineers, I have become aware how the qualities of the ideal arch match what I see as the full potential of mixed methods.

There are parallels between how an ideal arch is constructed and the execution of the two strands of a mixed methods study. This kind of arch is built from the ground up with two sides. In my conceptual framework, this represents the unique contributions of qualitative and quantitative approaches. One side cannot stand without the other. In a perfect arch, each of the building blocks are wedge shaped and added one by one, working toward the apex that is added as the last step. This is like the systematic, step-by-step process of executing a research procedure, such as occurs by using the constant comparative method to develop a grounded theory. This is consistent with a constructivist paradigm or view of knowledge that maintains that rather than being discovered in one fell swoop, knowledge is built from the ground up, generally one small increment at a time.

An ideal arch has qualities that also characterize the outcomes of paradigm-shifting research. These can be seen in Figure 1.2. This is a photo of an arch in a remote location at Lake Titicaca in Peru that I happen to have visited.

FIGURE 1.2 ■ Freestanding Arch at Lake Titicaca, Peru



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Two salient characteristics of an ideal arch are that they are durable while at the same time often aesthetically pleasing. Some still survive in the aqueducts built during Roman times throughout Europe and the near East, such as the example shown in Figure 1.2, which can stand independent of a surrounding structure. When there is a surrounding structure, such as the famous Arche de Triumph in Paris erected after World War II, it is the arch that is supporting the structure around it. The structure is not the mechanism holding up the arch.

Another direct connection between an ideal architectural arch and the essence of a fully integrated approach to mixed methods lies with the keystone. Hidden by decoration or in plain sight, a keystone is the apex of the ideal arch. Figure 1.3 is a photo of an ideal arch with a keystone.

A keystone is a wedge-shaped piece of building material that is the last piece slipped into this kind of arch. It is not a part of all arches. The wings of an arch create perfect tension by resting against the keystone. Once the keystone is set in place, each side is equally strong because each wedge-shaped piece shares the load equally. This makes it a highly efficient structure. This is like “pure” mixed methods, where the

FIGURE 1.3 ■ Ideal Arch With a Keystone



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qualitative and quantitative strands are given equal priority (Johnson, Onwuegbuzie, & Turner, 2007). To stand, arches do not need the building material that is added above it, to the sides of it, or behind it to form an archway in a building. When it is well designed and the tension is equally distributed and supported, an arch can stand indefinitely, even as the building around it topples in the face of time.

I see parallels between the role of a keystone in an ideal arch and role of inferences in high-quality mixed methods research. *Inferences* are generalizations or interpretations constructed by the researcher that go beyond the results, participants, context, and sometimes theory and that vary by level abstraction (Ercikan & Roth, 2006). Inferences have many attributes; some, for example, pursue implications for future research, practice, policy, and/or theory. There are additional types of inferences in mixed methods that are not found in other research approaches.

A **meta-inference** is a type of inference that is unique to mixed methods. According to Teddlie and Tashakkori, meta-inferences *are inferences that link, compare, contrast, or modify inferences generated by the qualitative and quantitative strands* (2009, p. 300). It introduces an additional layer of abstraction by weaving together two or more inferences. A meta-inference is closely tied to the results of the analysis but is constructed in such a way that it links or merges results from the qualitative and quantitative strands. The keystone serves as a metaphor for different types of inferences, including those that link results from the qualitative and quantitative strands and those that merge them. Examples of these different types of inferences are presented in Part 2 of this book.

Arches can be built more cheaply by omitting the keystone and using a horizontal beam. A horizontal beam is a more common link between the vertical supports, but it is not as durable or aesthetically pleasing as the circular arch. Figure 1.4 is a photo of this kind of arch, also ancient and also in Peru. It is called Gate of the Sun and was constructed 1,500 years ago from a single piece of stone. It shows that the weak point of this kind of nonideal arch is at the center of the beam. This is where, without a keystone, the horizontal beam introduces pressure that is not offset by other elements of the design.

To me, the kind of nonideal, horizontal beam we see in Figure 1.4 represents a particular kind of mixing when drawing conclusions. There is a bridge between the qualitative and quantitative strands of a study, but this is often done in a way that merely juxtaposes them. This form of mixing presents results or findings from the two strands of the study as independent conclusions or inferences, without any superordinate inference that intermingles them. There is a telltale signal for this kind of mixing. You can see it in the results discussion section of a research article that is labeled with separate sections to summarize the qualitative and quantitative results without providing an additional section that brings together the two results to introduce an additional layer of meaning. On occasion, this kind of organizational strategy can allow two contradictory findings to remain unaddressed.

At this point in the evolution of mixed methods as a distinct methodological tradition, the idea of fully integrated mixed methods studies is more of an ideal than a reality widely evident in the literature. It is still very common to come across a research publication broadcasting a mixed methods label but this is no acknowledgement

FIGURE 1.4 ■ Gate of the Sun



of the body of methodological literature that supports it. As much as I value the resourcefulness of researchers using mixed methods to pursue unexpected results, I find it hard to imagine that a researcher could achieve a fully integrated study (i.e., create a perfect arch) without familiarity with the methodological literature and without deliberately setting out to do so.

“MIXED UP” METHODS

Despite the explosion of the use of mixed methods across many academic disciplines, there is no doubt that a group of academics object, sometimes vociferously, to the use of mixed methods. Some of their reasons are philosophical; others are practical. One overriding concern deals with the assumption that there is no logic of inquiry in mixed methods.

Those with the most deep-seated concerns about mixed methods are probably those that are the most reflexive about the paradigmatic assumptions underlying their use of either a qualitative or a quantitative tradition. In my experience, these are most likely to be researchers that have a strong preference for qualitative methods. Among the group voicing objections would be those, perhaps who might be appropriately labeled as “purists,” who see qualitative and quantitative research as being conducted with entirely different paradigmatic assumptions about the nature of reality and how knowledge is constructed. Members of this group might have difficulty imagining a mind so nimble as to be able to simultaneously value insight gained from the perspective of a single case study with those derived from sophisticated statistical procedures. The view that mixed methods researchers are attempting to merge clashing paradigms is pursued in further detail in Chapter 3.

Others who express strong reservations about mixed methods may do so with practical concerns in mind. There is no question that some mixed methods studies are ambitious in design. Often, research about the effectiveness of an educational or health-related activity or program can involve multiple stages, researchers with diverse areas of expertise, and a far more ambitious time span than can realistically be undertaken by a graduate student. This is not always the case, however. There are some standard templates for the design of mixed methods studies, such as the basic triangulation design, that are not overly ambitious for a master's thesis or dissertation. In this type of design, qualitative and quantitative data might be collected simultaneously in a single questionnaire through the inclusion of both close-ended and open-ended questions. There is an extended discussion of designs that are realistic for dissertation research in Chapter 9.

Probably the greatest accusation behind derisive references to “mixed-up” methods is the suspicion that mixed methods provides an endorsement of wholesale piracy of analytical and sampling strategies without concern for the methodological and philosophical assumptions that accompany them. This kind of piracy is not particular to mixed methods, however. Misuse of labels to characterize research is not an uncommon feature of the published research, particularly in journals without a strong methodological interest. It occurs, for example, when so-called ethnographic interviews do not emanate from fieldwork or when the label *grounded theory* is inappropriately affixed to research that is conducted to test a preexisting theoretical framework.

The issue here is not pointing to a weakness inherent in the foundational assumptions about the purposes of mixed methods research but the often-uninformed application of the label to research that has not had the benefit of being embedded in the foundational literature about it. This would be the group of researchers that are mixed up about appropriate uses of mixed methods.

Mixed methods should not be taken as an excuse to violate the foundational philosophical assumptions (i.e., logic of inquiry) of either the qualitative or quantitative tradition. In quantitative research, this includes relatively large sample sizes and sampling strategies designed to provide support for claims that the results are generalizable to other settings. In qualitative research, foundational assumptions include concern for capturing the lived experience of participants and for recognizing the interplay between individual attitudes and behavior and the environmental and cultural context. There is no lack of elegant mixed method studies that manage to effectively incorporate the strengths of both perspectives without violating their foundational assumptions.

CONTROVERSIES INVOLVING FOUNDATIONAL ISSUES

Methodologists writing about mixed methods often do so with the goal of advancing the quality of the design and execution of mixed methods studies in practice. Not surprisingly, with growing consensus about key elements of the definition of mixed

methods, standards applied to evaluate the quality of these studies have grown more exacting over time. Some types of studies that might have once been accepted as meeting some minimal definition of mixed methods no longer fit comfortably in that mold. One of these is what I might call “eternally parallel” studies, where the qualitative and quantitative strands are never considered in tandem. A second is where there are multiple sources and types of data, but these are analyzed in isolation of each other. I have already discussed the problem of studies that lack a genuine inductive or emergent strand.

Some of the most substantive advances in thinking in mixed methods involve the topic of mixing. As noted earlier, while there seems to be strong agreement that some form of mixing is mandatory to meet any minimal definition, there is still a pull and tug of what this should look like and the strategies that can be used to execute it. Growing consensus about the centrality of mixing to the definition of mixed methods brings into question the legitimacy of the claim that a study is mixed methods when the qualitative and quantitative strands are kept parallel and never genuinely engaged except in a perfunctory way with a sentence or two at the inference stage. These studies might more accurately be classified as another type of multimethod study.

There are plenty of good examples of research envisioned that, for very practical reasons, unexpectedly turn to mixed methods. There are multiple legitimate reasons for this. It is not uncommon, for example, for authors completing a quantitative study to unexpectedly find it expedient to add a qualitative phase to explain contradictory or puzzling findings or to explore why an intervention did not have the intended effects.

I do not share the objection to applying the label of mixed methods to studies that evolve into mixed methods but were not initially conceptualized that way. While not realistic for research designed to meet the requirements of a dissertation, the complex nature of the phenomenon being studied and the years of time and resources devoted to multiphase studies are probably two of the forces that led to the emergence of mixed methods as a distinct methodology. Often supported by external funding, the continued growth of these large-scale projects and their increasingly interdisciplinary nature make it difficult to keep up with their creative introduction of different ways to apply mixed methods.

We close the chapter with a summary of key points and a list of the terms introduced in the chapter.

Summary of Key Points

1. Just because someone completes a qualitative and quantitative phase does not necessarily mean it is a mixed methods study.
2. Mixed methods are both a research method and a research methodology.
3. A study is not mixed methods if there is no mixing or integration of the qualitative and quantitative strands.
4. Deductive and inductive analytical procedures are required to meet a minimal definition of mixed methods research.
5. The contribution of triangulation to enhancing validity is one of the key rationales for using mixed methods.
6. Because qualitative researchers often use numbers to report their results, the word–number distinction between qualitative and quantitative methods is only marginally useful.
7. One of the challenges researchers face when using mixed methods is to honor the fundamental philosophical assumptions of qualitative and quantitative approaches.
8. Fully integrated mixed methods take place when interaction between the qualitative and quantitative strands occurs at all stages of the study.

Key Terms

- Complementarity argument
- Evaluation research
- Fully integrated mixed methods research
- Inferences
- Meta-inference
- Method
- Methodology
- Mixing
- Multimethod studies
- Phases or stages
- Quasi-mixed methods
- Triangulation

Supplemental Activity

Create a table that summarizes similarities and differences in the definitions of mixed methods offered by various researchers in Table 1 in the article by Johnson, Onwuegbuzie, and Turner (2007).

Recommended Reading

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 1*(2), 112–133.