

# **“Mixed Methods in my Bones”: Transcending the Qualitative-Quantitative Divide**

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## **Abstract**

Jennifer Mason (2006, p. 19) calls for thinking that transcends or even subverts the qualitative-quantitative divide, suggesting it is more helpful to think in terms of multidimensional research strategies. Max Bergman describes the terms *qualitative* and *quantitative* as the *straw men* of research. This article challenges the (largely U.S.-based) notion that mixing methods necessarily means combining a quantitative and a qualitative method or approach to research, and argues that thinking in this way serves as a distraction from the purpose of research and, therefore, is counterproductive to good research. It does so on the basis that such thinking artificially divides the natural order of things; that it is actually not possible to clearly delineate differences between qualitative and quantitative approaches; that the meaning of everything, including numbers, is theory based and all research is interpretive; that it is better to focus on what methods will best answer the research questions than on attempting to show that the research design cleverly combines qualitative and quantitative approaches; and that, ultimately, whatever methods are used will become “inextricably intertwined” as a study proceeds (Miles & Huberman, 1994, p. 41).

*Keywords:* mixed methods

## **“Mixed Methods in my Bones”: Transcending the Qualitative-Quantitative Divide**

Jennifer Mason (2006, p. 19) calls for thinking that transcends or even subverts the qualitative-quantitative divide. She suggests it is more helpful to think in terms of multidimensional research strategies and to develop “‘multi-nodal’ dialogic explanations that allow the distinctiveness of different methods and approaches to be held in creative tension.” In this article, I analyze the problem that she raises, provide an alternative multidimensional perspective, and describe ways mixed methods researchers can put that perspective into practice.

### **Terms that Divide the Investigative World**

There are many ways we can divide our perceptions and understanding of the world we live in, work in, and, as researchers, investigate. Natural or artificial is one that comes immediately to mind. Real or imaginary, past or present, and academic or practitioner are others. For Song, Sandelowski, and Happ (2010, p. 731), the terms qualitative and quantitative similarly “reify a view of the world of inquiry as divided into two” and, as such, are “uninformative.” When data are divided into qualitative and quantitative, it limits the possibility of seeing them and the world they represent through other dimensions, or even as being dimensional at all. Some have attempted to apply alternative words to describe inquiry, such as fixed or flexible, structured or unstructured, variable or process oriented, and inductive or deductive, but end up similarly dividing the world into two—one pair of terms is simply substituted for another with just a slight adjustment of the boundaries. Use of these terms is often associated with further assumptions, such as that quantitative data are more rigorous, and that qualitative data are suitable only for exploratory or descriptive studies.

In the 1980s and 1990s it was very common for social science writers, and especially those writing about qualitative or mixed methods, to list comparative tables of the features of quantitative and qualitative research. Indeed, these still appear today in introductory texts. As an experienced researcher who had been using mixed methods since the 1960s but who discovered the qualitative and mixed methods methodological literature three decades later, I was taken by the range of differences suggested. Quantitative and qualitative research were presented as clearly distinct, and yet the descriptors used were typically poles of shared dimensions, suggesting they shared a conceptual foundation. When preparing a paper in 2003, I identified 40 such comparative pairs—and it was possible to think of ways in which almost every one of those paired characteristics could be applied in some way to examples of research assumed to be of the opposite approach. Observing this same phenomenon, Lisa Pearce (2015, p. 47) came to the conclusion that “the Q [qualitative, quantitative] boxes fail as an organizing design framework” for studying phenomena and “we should resist the urge to assume methods fit one Q box or the other.”

Our inability to clearly specify a distinction that all of us nevertheless have a general sense of is indicative of the lack of a clear and defining difference (Small, 2011). My early conclusion was to see the distinctions made as components of a multidimensional continuum. The poles of each component dimension had a stronger but not a necessary association with either quantitative or qualitative

approaches (and then, of course, I discovered some others had come to a similar conclusion). The characteristics of any study place it at varying points along each of those multiple dimensions, though some consistently tend more to one pole than the other. With no essential congruence between positions along the different dimensions of the quantitative-qualitative continuum within any one study, the terms quantitative and qualitative become most useful either for giving a sense of overall direction in a study (hence I prefer to refer to these as approaches), or simply as broad descriptors of the type of data or analyses being used. Bergman (2008) usefully describes these as “two large and heterogeneous families of methods under convenient headings” within which the members vary “to such an extent that it is difficult to identify a unique set of qualities that encompasses the characteristics of one family of methods, and that is clearly distinctive from the characteristics of the members of the other family” (p. 14). Better to avoid the “terminological morass” of the mixed methods literature and apply “clear explanations of what is planned or was done in a study and why” (Song et al., 2010, pp. 730, 731).

This bifurcation was accentuated by the trend, in the 1980s and 1990s, to tightly associate methods and methodologies with philosophical paradigms (Guba & Lincoln, 1994; Lincoln & Guba, 1985; Tashakkori & Teddlie, 1998). The consequence was to proscribe mixing of methods (Smith & Heshusius, 1986), even though researchers had been doing it for decades, if not centuries (Maxwell, 2016; Rallis & Rossman, 2003). Some busied themselves developing guidelines and others with refuting those, while others of us continued (for some, in blissful ignorance of these debates) to just do as we always had done. In part, this flurry of activity was a natural response of particular qualitative and mixed methods research communities needing to show that they were distinctive, to break loose from a dominant (positivist, objective) tradition they could no longer support. Bergman (2008, p. 19) described it as “a form of straw man building that may be related to a considerable degree to delineating and preserving identities and ideologies rather than to describe possibilities and limits of [different] data collection and analysis techniques.” Those initially promoting mixed methods research went to so much trouble to present arguments for why mixing was possible (e.g., Tashakkori & Teddlie, 1998) that they inadvertently accentuated the problem of seeing the world of data and research as divided into two (Vogt, 2008). With increasing maturity of the field, some of the dogma that forced a separation between qualitative and quantitative approaches has moderated, but nevertheless, it carries through in expectations that continue to reinforce this particular divide. This is most evident when it is assumed or stated that mixed methods implies or requires a combination that includes a definable quantitative method and a definable qualitative method (a requirement, for example, for publishing in the *Journal of Mixed Methods Research*).

## Observing and Representing Phenomena

The phenomena with which we are surrounded are ontologically and epistemologically neutral. Any phenomenon has both qualities and quantities, each of which might be described both objectively and subjectively. We can represent phenomena, including mental phenomena, in multiple ways using both numbers and words—or in images or sounds—and indeed, in everyday life we would typically do so. Think about how you would describe your house, or your experience as a university student. A clinician might assess pain as a subjective experience, measure it with an interval scale, then on the

basis of both of these, make a categorical decision about whether surgery is warranted (Vogt, 2008). Researchers move routinely between deductive and inductive thinking about their topic as they consider what is known and puzzle about what they are finding out in an iterative cycle of developing and testing ideas from and with data. Even researchers who claim to be working specifically using a quantitative or qualitative approach constantly blur supposed distinctions between these through their ambiguous use of language, seen in their extensive use of concepts and practices presumed to belong to the other approach (Gürtler & Huber, 2006).

Denzin and Lincoln (2011, p. 3) defined qualitative research as “a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings and memos to self.” One could begin a definition of quantitative research in exactly the same way—numbers and scales are used also to represent and make visible aspects of the sensory and empirical world (Gorard, 2010b; Stevens, 1946). Between the world we observe and experience and having data for analysis, there are multiple layers of interpretation and transformation—and then more, as data are analyzed. Data are “taken” rather than “given,” they are selectively constructed by researchers from experiences as “raw data” are collected and then converted to serve as evidence: “Qualitative and quantitative data are not so much different kinds of data as these data are experiences formed into, for example, words or numbers, respectively” (Sandelowski, Voils, & Knafel, 2009). Whether we use numbers, words, or other images does not change the phenomenon being described or analyzed, although it can change how we think about it, and how we present it to others. It is in our approach to thinking about things that we begin to divide and classify what is, by nature, integrated. The primary way in which we take nature apart is to separate quantity from qualities, but, in so doing, we ignore other ways of representing a phenomenon (e.g., using images or graphics, music or dance, time or place) and we can lose the perspective of the whole.

#### *The social survey as a mixed (hybrid) form of representation*

The questionnaire or survey (I will use survey to cover both), which asks respondents to select boxes or numbers to represent their answers to questions, is usually classified as a quantitative method. Questions are designed, based on a combination of preliminary participant experience (gathered through preliminary interviews or discussions), researcher experience and knowledge, and the researcher’s interpretation of academic literature and participant experience. Questions might be designed to deductively test a hypothesis, or to inductively explore experience or to build a theoretical model. Eventual participants choose to respond, influenced by their sense of whether the survey is relevant to them, how they feel on the day, and perhaps, on what inducements are offered. They interpret the intent of each item, according to their own understanding of the words and context. Their responses might be indicated by selecting or writing a number, by marking a scale, or perhaps by checking against a word or phrase that will then be converted into a number by the interviewer, data entry clerk, or researcher. Each of these numbers serves “linguistically as stance markers” (Schrauf, 2016, p. 45). Respondents might be frustrated by the options offered, and add comments on the side. There could be options to add their own words; these also are often converted to a number using the

judgement of an interviewer or the person entering the data—or perhaps by a computer program. To this point, the whole process has been classically *qualitative*.

Contrary patterns of thinking have been found to influence responses to scaled items (e.g., satisfaction scales) in a variety of ways, even when gathered as an integral part of an interview, such that responses to them contradict contiguous interview text (Green, Statham, & Solomou, 2008). And yet, the validity of assumptions about the data gathered, particularly by those conducting opinion polls, is generally untested:

The use of large-scale “tick-box” questionnaires is often favored by researchers employing primarily quantitative research methods because it provides data that are precise and, arguably, unambiguous. The implicit expectation is that survey respondents comprehend the questions posed in the same way as the researchers/pollsters do, that they hold attitudes on all the issues raised, and that they are willing to share these views with the researchers. (Feilzer, 2010, p. 11)

Indeed, these assumptions are countered by the propensity of people to write additional comments around the questions whenever it is possible to do so (Roiser, 1976), some of which reveal quite contrasting rationales from respondents who have given identical responses to a categorical item (Feilzer, 2010).

Nevertheless, having obtained responses to his or her questions or statements, the researcher takes them in their numeric form and processes them statistically, producing lists and tables, comparisons and predictions, largely based on calculations from nominal (categorical) or ordinal numbers set out as *scales*—theory-based numbers that are regarded by mathematicians as being more qualitative than quantitative. Statistical results describing items and the relationships between and among them are interpreted by the researcher who makes judgments about the strength of differences and associations, and what those differences or associations might actually mean. For items designed to be combined into a scale using factor analysis, the researcher chooses the best solution, making interpretive judgments about how many factors (constructs) there are, which items to include, what to call them, and what they mean. None of this processing is automatic. The scales generated from this are refined, and scores for each participant are calculated. A final numerically based report, assumed to reflect participants’ experience and beliefs, is read as *fact* with little recognition of the degree to which interpretation and construction of meaning has been involved at every step in its production (Gürtler & Huber, 2006). Although statistical processing was involved, the entire process has been largely a qualitative exercise.

Robert Schrauf (2016) argues that responding to either an interview or a questionnaire is a linguistic exercise that generates discourse. Methods of and frameworks for analyzing discourse are, therefore, equally appropriate to both, serving to genuinely integrate data gathered through different tools:

Careful attention to the dynamics of data collection shows that in both the face-to-face standardized survey and in the computerized or paper-and-pencil survey, the participants interact with either the actual survey administrator or the printed/voiced instrument itself. ... participants activate and utilize the everyday meaning-making strategies of normal conversation

in construing their responses ... stance-taking by participant[s] is the linguistic core of any survey (p. 77).

Because he is employing a discursive framework, when analyzing survey data, Schrauf focuses on participant response patterns (“his or her stance profile”) rather than on analysis of the items that make up the survey. In the context of combining surveys with interview data, Schrauf recommends using consensus analysis. This is a factor-analytic method structuring participants rather than items, which, therefore, allows the researcher to see how much (and which) participants agree, and where each sits in the social space relative to the topic of the survey. Alternatively, social network analysis can be used with the data to provide a visual map of the social space in a way that adds information about people’s roles in the network (e.g., leaders, clique members, bridges, isolates).

My conclusion from this analysis, therefore, is that this time-honored “quantitative” method (the survey or questionnaire), is as much, or more, qualitative than quantitative, and is most appropriately considered as a hybrid method—a blend of the two.

### **All research is interpretive**

That all research is theory laden is now well recognized (Howe & Eisenhardt, 1990; Johnson & Onwuegbuzie, 2004). Building an awareness of one’s assumptions, for example through conceptual modelling, and articulating one’s conceptual framework before gathering data each serve to clarify the ways in which these will influence interpretations of data. Researchers are now seen as having a responsibility to make this clear for the eventual readers of the research also.

Statistics have been classically associated with positivist epistemologies that emphasize the need for objective observation and the importance of the reliability with which observations are documented and measured. Researchers who have not progressed beyond strict rule-based analysis live or die by whether their results reach a magic .05 or .01 figure, without necessarily gaining a deep understanding of what is happening in their data, or what chance events might be influencing their results, and where outliers are discarded rather than understood. Yet, those who ignore the interpretive quality of statistical analyses do so at their peril. Apart from the researcher making theoretical or assumption-based judgments about what variables to use and how to associate them, there is the issue of what significance really signifies (Cumming, n.d.; Gorard, 2010a, 2015; Halsey, 2015). In the introduction to his popular statistical text for psychology students, David Howell (2014, p. xi) observed: “Statistics is not really about numbers; it is about understanding our world.” Being *significant* does not necessarily mean the results have any clinical or practice significance, for example (De Vito Dabbs et al., 2004). One of the most dramatic shifts in perspective on the pre-eminence of scientific method and associated statistical analyses was seen when Donald Campbell, known for his writing about experimental methods, threats to validity, use of statistics, and condemnation of case study methods, reflected in later life: “If we are to be truly scientific, we must re-establish the qualitative grounding of the quantitative” (Campbell, 1974, p. 30). Statistical results always need to be evaluated in the context of the total research process and, wherever possible, in relation to preliminary or parallel qualitative data.

Seminal early writers in mixed methods also emphasized the common interpretive grounding of different data types and analysis processes, as a basis for combining methods: “Ultimately all methods of data collection are analyzed ‘qualitatively,’ in so far as the act of analysis is an interpretation, and therefore of necessity a selective rendering, of the ‘sense’ of the available data” (Fielding & Fielding, 1986, p. 12). When Jick (1979) needed to resolve a problem of dissonance between evidence from different sources, he found that “qualitative data and analysis” was the “glue that cements the interpretation of multimethod results” (p. 609). Indeed, interpretation of how methods have impacted participant responses is perhaps the most common way in which mixed methods researchers explain dissonance in results obtained when using different methods.

### **Ontology and Epistemology, Methodology and Methods**

If epistemological differences were the foundation to the bifurcation of qualitative and quantitative, where might they now sit in a less divided world? This is a world where even those conducting a “gold standard” randomized control trial are viewed as needing to gather experiential data as well as observable outcome data in order to really understand what effect an intervention is having and how it is doing that (Donovan et al., 2002; Drabble & O’Cathain, 2015; Plano Clark et al., 2013; Rogers, 2011; Song et al., 2010). Indeed, an experiment can be conducted using only qualitative data (Robinson & Mendelson, 2012), and although studies of causality can benefit from assessing statistical associations, they are not dependent on them (Maxwell, 2004, 2012). Indeed, statistical associations are not particularly helpful in causal analyses of major social movements or one-off events (e.g., Allison, 1971; Vogt, 2008).

It was stated earlier that the phenomena we study are ontologically and epistemologically neutral. Confusion arises (a) from assuming that ontology determines epistemology, and that epistemology determines method; (b) from misunderstandings of methodology, method, and data—what these are and what the links are among them; and (c) from categorizing the continuum of research traditions by essentializing qualitative and quantitative (as noted earlier). For example, realist ontology is commonly associated with objectivist epistemology, but critical realism (as one example) accepts that not only physical but also mental and social phenomena are real, while also asserting that we each construct a subjective (and, therefore, variable) understanding of those phenomena. Similarly, pragmatists accept the existence of reality, but also that we interpret it on the basis of our experience of it.

Ontological and particularly epistemological perspectives influence, but in practice do not necessarily determine the choices we make about the approach to take in studying a phenomenon— affecting whether that phenomenon (physical, mental, social) is seen as being real or as existing only in someone’s subjective understanding. This consequently influences the broad methodological approach taken to studying it, such as whether the focus is on what can be observed and measured, or on what and how something is experienced (so, for example, a choice between an experimental approach or phenomenology or ethnography). Particular methodologies, and divergent versions of those methodologies, have been built and modified, respectively, on identifiable epistemological foundations (different versions of phenomenology, for example). But—and this is a big *but*—neither epistemology

nor methodology determine the data or methods that can be used for studying that phenomenon. Observations can be recorded in numbers, words, or images—and converted from one form to another in analysis. Experience, attitudes, and beliefs can be tapped with scales and structured questions as well as with interviews, diaries, and other less structured methods, regardless of whether one sees these as real, or as social constructions—ethnographers might use all such methods, for example. And from experience, I can say it is possible to build a grounded theory on the basis of a given set of brief, de-identified clinical notes using numbers as much as words—not a preferred approach, but possible.

Both text and numbers can be treated as respondents' constructions of their worlds, reinterpreted and reported by the researcher, or as representations of reality, analyzed, and reported descriptively as being "what is." Any form of data can be treated inductively or deductively, depending on the prior knowledge and purposes of the researcher. Statistical analyses with small or large samples can be used in an exploratory or confirmatory way—psychology experiments have often involved quite small samples, for example. Similarly, although text analyses are usually restricted to small samples and more often than not use emergent coding methods, some of the British cohort studies (and others) have obtained semi-structured interview responses from large samples, using a combination of a priori and emergent coding methods. And very large volumes of textual material are now being analyzed either using crowd sourcing to conduct the initial coding (Williams & Burnap, 2015), or using automatically applied natural language processing procedures to code and then generate statistical results, supplemented by some interpretive analyses.

The epistemological difference, therefore, is not in the form of the data, or even with the analysis choices made, but with how one interprets that data and the insights gained from the analyses.

### **Thinking and Working Holistically**

Researchers freed from thinking about data and methods in binary terms will be guided in selection of data sources and methods of collection and analysis primarily by their purpose and questions, by the kinds of data that are accessible, and practically (though not desirably), by their analytic skills (or access to same).

Conceptual mapping and process modelling provide particularly useful interim steps when deciding what data are needed to answer questions. These visual strategies require that the questions are broken down into their constituent parts, and that presumed (or hypothesized) links among them are shown. These might be based on prior theory, everyday assumptions, or preliminary data. They reveal items (concepts and links) for which data will be needed, what is already known, and where gaps in knowledge are. Some free-thinking is then applied to considering what kinds of data would best meet those needs, balanced by an exploration into what data might be accessible for each of those elements. Analysis strategies applied to those data are similarly determined. Nowhere in this process is it relevant to ask whether the data, or the methods of analysis, can be defined as qualitative or quantitative.

Multiple forms of data are available that can be analyzed and interpreted using both statistical and hermeneutic strategies; multiple forms of data are available that defy definition as being intrinsically quantitative or qualitative. Methodologies best described as hybrid, including social network



analysis, qualitative comparative analysis, and use of geographic information systems, among others (Bazeley, 2016), are gaining increasing attention and use. In addition, mixed methodologists will be particularly attuned to the potential for iterative exchanges between data sources and between methods, as they work through a project. Ultimately, whatever methods are used will (or should) become “inextricably intertwined” as a study proceeds (Burch & Heinrich, 2016; Miles & Huberman, 1994, p. 41).

Finally, a holistic approach will be evident in the way a study is reported. Regardless of the type of data or analyses they draw on, the presentation of results will be structured according to the structure of the phenomena that are the subject of the study and the report—words, numbers, and images working together to tell the story of the research and what it has revealed (Bazeley, 2015; Greene, 2007).

### *Transcending the divide in a multidimensional world*

Jennifer Mason went on to say:

Explanations do not have to be internally consensual and neatly consistent to have meaning and to have the capacity to explain. Indeed, if the social world is multi-dimensional, then surely our explanations need to be likewise? I want to suggest that we should develop ‘dialogic’ explanations which are ‘multi-nodal’. By ‘multi-nodal’ I mean that the explaining that is done involves different axes and dimensions of social experience. By ‘dialogic’ I mean that the ways in which these axes and dimensions are conceptualized and seen to relate or intersect can be explained in more than one way, depending upon the questions that are being asked and the theoretical orientations underlying those questions.’ (Mason, 2006, p. 20)

The world is not divided into two. Not only are there many shades of grey, there is richness of color.

### **Mixed Methods “In My Bones”**

In the coda to his wonderful book, *Tricks of the trade: How to think about your research while you’re doing it*, Howard Becker (1998, pp, 215-218) describes “what it means to have gotten a social science way of thinking into your bones”—a way of thinking that, with practice, becomes “as natural as breathing,” so that wherever you go and whatever you are doing, you are raising “questions about everything you see and hear and handle.” This habit of thinking, now performed unconsciously, then infuses your “serious” research, having prepared you for confronting the questions, the phenomena and the materials you will be dealing with.

In the same way, a researcher who habitually transcends the artificially created binary divide in data and methods, who approaches the phenomena he or she is observing and studying with an open mind, will practice *a mixed methods way of thinking*, and perhaps be able to say they have gotten a mixed methods way of thinking into their bones:

A mixed methods way of thinking is an orientation toward social inquiry that actively invites us to participate in dialogue about multiple ways of seeing and hearing, multiple ways of making sense of the social world, and multiple standpoints on what is important and to be valued and cherished. A mixed methods way of thinking rests on assumptions that there are multiple legitimate approaches to social inquiry and that any given approach to social inquiry is inevitably partial. Better understanding of the multifaceted and complex character of social phenomena can be obtained from the use of multiple approaches and ways of knowing. A mixed methods way of thinking also generates questions, alongside possible answers; it generates results that are both smooth and jagged, full of relative certainties alongside possibilities and even surprises, offering some stories not yet told (Greene, 2005). In these ways, a mixed methods way of thinking actively engages us with difference and diversity in service of both better understanding and greater equity of voice (Greene, 2007). (Greene, 2008, p. 20)

Mixed methods have been in my bones since I began (formally) researching as a 1960s undergraduate. Only in 1998 did I put a name and an identity to what I had been doing for 30 years.

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