Elaboration, Generalization, Triangulation, and Interpretation:

On Enhancing the Value of Mixed Method Research

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Abstract

This paper examines means of enhancing the value of mixed method research for organizational science. Conclusions are based on a comprehensive analysis of 69 mixed method articles published in four empirical journals between 2009-2014, detailed case comparison of four illustrative articles, and personal interviews with lead authors for each case. Findings provide three key contributions. First, documenting the prevalence of mixed methods over the last six years in a broad selection of journals, five approaches to mixed method research are identified – including three novel approaches not yet elaborated upon in prior treatises on research methods, expanding the feasible options for mixed method scholarship, and bolstering confidence in considering such approaches. Second, themes pertaining to enhancing the value of mixed method research are revealed, including elaboration, generalization, triangulation, and interpretation. Finally, findings uncovered four sets of practical techniques by which this value can be increased. Together, these contributions provide guidance for those endeavouring to utilize a mixed method approach in organizational science.

Key words: mixed methods, research design, methodological review

When organizational scholars design research they often seek answers to questions such as: What types and sources of data will enable me to meet my research objectives? How might these be combined and sequenced in order to increase odds of eventual publication and impact? How can I minimize sources of error or other threats to rigor? How can I ensure that expenditures of time, effort, and resources will yield scientific and practical contributions? To address these questions, I conducted a mixed method empirical examination, combining quantitative and qualitative data and analysis, in order to gain a broad understanding of the current prevalence of mixed method organizational research, including novel approaches to conducting such research, the specific types of value mixed methods add, and practical techniques for increasing this value. In doing so, this paper makes three key contributions to organizational research.

The first contribution is to expand our understanding of approaches to mixed method designs. I begin by documenting mixed method efforts based on a comprehensive literature search and coding of the 1539 peer reviewed research articles appearing in the last six years (2009-2014) drawn from a broad array of four top empirical journals in the organizational literature. Results highlight a continuum of research designs, ranging from single method/single source to mixed method/multiple sources. Yet cataloging indicates that single method designs are by far the most prevalent in these journals during the period in question, while mixed method research is still very rare, comprising only 69 articles (4.48%). Qualitatively analyzing these mixed method articles revealed five approaches. The first two of these have been described in prior research (e.g., Edmonson & McManus, 2007; Creswell & Plano Clark, 2011; Greene et. al., 1989); however, the others are novel and emerging approaches. Identifying instances in which these more novel approaches have been successfully published lends them credence, and provides encouragement to those who might be considering such approaches. The approaches are then illustrated with four case exemplars, with care taken to select articles from across the journals included in the review, encompassing a variety of designs and data collection strategies (i.e., surveys, interviews, archival data analysis). Exemplars include: Barley, Meyerson & Grodal (2011, *Organization*

Science); Gardner (2012, *Administrative Science Quarterly*); Toegel, Kilduff and Anand (2013, *Academy of Management Journal*); and Bezrukova, Thatcher, Jehn & Spell (2012, *Journal of Applied Psychology*). Reflections from the authors involved in producing the case exemplars are included, based on personal interviews with these authors.

The second key contribution is to analyze these articles and interviews to arrive at emergent themes regarding the assets of mixed method research and how to achieve them. Four major strengths of the mixed method design are illustrated – enhanced capacity for elaboration, generalization, triangulation, and interpretation. Although aspects of these strengths have been described in prior reviews as constituting the purpose behind mixed methods (e.g., Greene et al. 1989), authors of the exemplars reviewed here provide distinctive insights as to how to achieve the assets, serving to increase the rigor and impact of the scholarship, with rigor defined as scientific soundness of the claims, and impact defined variously as making advances to understanding or knowledge, or influencing or contributing to improvements in practice (Association to Advance Collegiate Schools of Business, 2012; Economic and Science Research Council, 2015; Australian Research Council, 2015).

Finally, the third key contribution resulted from analyzing the articles and cases to determine unique strategies for the practice of conducting mixed method research. Recognizing that mixed method research is not a panacea, and that its utility is not ubiquitous, challenges (and even liabilities) associated with such research are revealed. Themes are identified capturing the keys to success reported in the cases, but also those techniques or elements that the authors lamented were missing from their efforts (that they wish had been incorporated). Four practical sets of recommendations, not well documented in prior reviews, but emphasized in the case studies include: (1) even in mature domains, consider using a mixed method approach that is finely tuned to elaborate on shortcomings in prior construct or model development; (2) utilize iterative processes with insights gained from initial phases to inform subsequent data collection, and improve access, generalizability, and impact; (3) achieve triangulation by expanding analytical options through decoupling the sequence of analysis from the

sequence in which data was collected, or by shifting the unit of analysis, and by revisiting the literature to inform analysis; (4) strategically frame the findings to illustrate the depth of interpretation made possible by mixed methods both within the article itself and also during the submission and revision process. Together, these themes provide fresh guidance for those endeavouring to utilize mixed methods.

The Range and Prevalence of Mixed Method Research

In classifying research designs, *method* often refers to the type of data collected (i.e., qualitative or quantitative) as well as the analytical technique used with the data (Johnson, Onwuegbuzie & Turner, 2007). *Qualitative data* are data that were originally orally communicated (e.g., in interviews) or that which was observed, and subsequently transcribed into text, that which has appeared in verbal written form (e.g. in a letter to shareholders in the company annual report; in an article that appeared in the media about a firm), or in image-based form (brain imagery; photographs; videos). *Qualitative analysis techniques* are a set of processes for making sense of such data, which include (but are not limited to) deriving categories for sets of codes and themes that appeared in the text or images and describing the relationship among these; interpreting meaning, symbolism or rhetoric based on holistic understanding of respondents' words, actions, or depictions; or deriving patterns or trajectories based on interpretive comparison of themes or events.

Quantitative data are numeric representation of concepts, such as that based on survey scores, appearing in financial reports, or in the form of rankings or evaluations. *Quantitative analysis techniques* are a set of processes for making sense of numeric data, examples of which include descriptive statistics; predictive statistics based on probability such as correlation, regression, or structural equation models; Bayesian modelling; or network analysis based on quantification of links between nodes. A *mixed methodology*, therefore, includes a combination of qualitative and quantitative data or contains qualitative data which have been converted to numeric data and analyzed using quantitative techniques (or vice versa) (see the summary of prior definitions in Table 1).

Insert Table 1 about here

In addition to method, the current study also revealed the importance of considering the *source* of data, meaning the provider of data, that is, where data have come from (e.g., employee, customer, financial report, performance review, operations logs, etc.). In many studies, an effort is made to collect data from sources both internal and external to the entity in focus, in order to establish independence of data and avoid what is often referred to as single-source bias, which arises when overlapping variability is due to data collected from a single source (Campbell & Fiske, 1959). For example, if the entity in focus is a firm, and most data were collected from within the firm, making the effort to obtain data from customers outside of the firm (e.g., about service quality or product innovation) ensures some independence of those assessments. Likewise, if the entity in focus is a work team, and most data were collected from team members themselves, obtaining data from an HR director with records of the teams' performance for example, helps to avoid single-source bias. Finally, if the focal entity is the individual, then self-reported data (e.g., self-ratings of individual creativity or performance) can be considered to be "internal," and data provided by people other than the focal individual (e.g., supervisor ratings of performance) are "external" to the focal entity. Hence, I considered a method as *multi-source* if data were collected from both inside the focal entity and from outside of the focal entity.

Using these definitions, four types of research designs emerge, arranged along a continuum from simple designs to complex designs. *Single method/single source* designs consist of one type of data or analysis technique, and one source. *Single method/multiple source* designs involve utilization of one type of data or analysis technique, but data have been collected from multiple sources (e.g., survey data were obtained from employees, supervisors and customers). A *mixed method/single source* design incorporates both qualitative and quantitative data, or analysis techniques, and for each type of data, there is just one source. For example, both interviews and numeric performance data might be collected from the same set of employees. Finally, in the most complex of designs, *mixed method/multiple source,* both qualitative and quantitative data have been collected, and for at least one of these types of data, there are multiple

sources (e.g., interviews are conducted with employees AND surveys are conducted with employees and customers). Interestingly, as this review will show, increasing the number of data sources for a given method is helpful in emphasizing that method, while at the same time concurrently drawing on the strengths of the mixed method design.

Many scholars have advocated that rather than attempting to prove the superiority of one method or source over others, instead the focus should be on achieving "methodological fit," or internal consistency among elements of a research project, including research question, prior work, research design, and theoretical contribution (Edmondson & McManus, 2007; Greene et al. 1989; Creswell & Plano Clark, 2011). Indeed, the appropriateness of each type of design depends on many potential factors, including issues such as: (a) the maturity of the domain of study, (b) the research question being asked, and (c) the objectives of the researchers. The aim in achieving "fit" is to increase both rigor and impact (e.g., Bergh, Perry & Hanke, 2006; Conlon et al. 2006; Judge et al. 2007; Newman & Cooper, 1993; Shadish et al. 1995; Starbuck, 2010; Stremersch, Verniers & Verhoef, 2007). Molina-Azorin (2012) found that a mixed method approach was a significant positive predictor of article impact, with the mean citation count of mixed method articles being 59.13, while the mean citation count for the monomethod comparison group of articles (pairs matched by the publication year) was 37.08. Yet, it is instructive to note that although many scholars have extolled the advantages of mixed method research in improving rigor and impact, it is still quite rare in the organizational literature, with estimates hovering between 14% and 2%, depending on which domains and time periods were analyzed (Molina-Azorin, 2012; Hurmerinta-Peltomaki & Nummela, 2006; Alise & Teddlie, 2010).

Johnson et al. (2007: 127) argued for the need for a contingency approach, which considers the conditions under which qualitative, quantitative and mixed method research should each be considered appropriate, recognizing the strengths and weaknesses of each, with all three being considered important and needed, albeit in different circumstances. Some have argued that mixed methods are used most successfully in cases where the goal is to generate greater understanding of the mechanisms underlying

quantitative results in at least partially new territory (Edmondson & McManus, 2007); other scholars have advocated that a mixed method design is helpful to resolve paradox or contradiction (Greene et. al. 1989; Molina-Azorin, 2012). To this, I would add that mixed methods are also well suited for proximal theory-building, which is characterized by openness to the unexpected, acceptance of uncertainty, and appreciation of multiplicity of views during interpretation of findings (Gibson, McDaniel & Szkudlarek, 2012). This approach can be contrasted with more distal approaches, which emphasize end states, linearity, stable and self-contained units of analysis, and firmly delineated boundaries (Cooper & Law, 1995). For this reason, mixed methods are also likely valuable in some domains where other approaches are less viable, such as examining dynamic settings (McDaniel & Gibson, 2012) or in multinational research where multiple world views are evident and understanding them is a critical objective (Gibson et al. 2012; Hurmerinta-Peltomaki & Nummela, 2006).

Within mixed method designs, there are a variety of different approaches possible, with previous reviews indicating anywhere from two to six major approaches, and even a few variants of those (see Table 1 for a review). For example, Edmondson and McManus (2007) stipulated two major approaches. One approach supplements qualitative work with quantitative data, the other approach supplements quantitative tests with qualitative data. Creswell (2003) refers to these as 'sequential procedures', in which the researcher seeks to elaborate on or expand the findings of one method with another method. Others have highlighted the possibility of concurrent approaches, in which quantitative and qualitative methods are used simultaneously (e.g., Tashakkori & Teddlie, 1998; 2003, 2010; Molina-Azorin, 2012).

In order to extend our understanding to the current prevalence of mixed methods research, approaches to conducting it, the value mixed methods add to organizational science, and techniques for improving it, I conducted a mixed method empirical examination and analysis, which I describe below.

Methods

Article Categorization

To understand the prevalence of research designs, we began by conducting a comprehensive literature search, coding the 1539 peer-reviewed research articles that appeared in the last six years (2009-2014)[1] in four top empirical journals from the organizational literature (*Academy of Management Journal*, *Administrative Science Quarterly*, *Organization Science*, and *Journal of Applied Psychology*). These journals were selected given that they each regularly feature in the top five amongst empirical organizational journals based on total citations or impact factor or as summarized in ratings by organizational scholars (with specific rankings varying from year to year and based on whether the list is focused on psychology, management, or business publications).[2]

A team of three coders conducted the categorization (the author and two research fellows), utilizing the definitions provided above as the guide. We agreed on most categorizations, and in those few instances that we did not, discrepancies were resolved through discussion amongst the three coders. Most of these discrepancies between coders rested on two issues. First, as we noted earlier, there were occasionally differences in understanding the distinction between "mixed method" and "multiple-source." Papers that included multiple sources of data were not considered mixed methods, if these sources were all one type of data (e.g., all quantitative or all qualitative). For example, the coding team discussed several recent papers in *Journal of Applied Psychology* that included multiple studies and sources of data in a single paper. Often, all of the data in a given paper were quantitative (variables represented by numeric scores obtained in surveys or in experiments). According to our conceptualization, even though they included multiple sources of data, publications such as these were not considered mixed

[1]Many previous reviews cover between one and ten year time frames (e.g., Alise & Teddlie, 2010; Green et al. 1989; Edmondson & McManus, 2007; Hurmerinta-Peltomaki & Nummela, 2006). Representing a mid-point in this temporal range, the current review originally included the most recent five full years since the date of the original submission in 2014 (i.e., 2009-2013); an additional year of data (2014 articles) were added during the review process to ensure the most recent indications of prevalence possible at the time of publication.

[2]For example, Journal Citation Reports (Thomson Reuters, 2015) for empirical Management journals indicates total citation rankings between 2011-2014 consistently as follows: JAP=1; AMJ = 2 or 3; ASQ = 4 or 5; OS = 5 or 6. In 2009 and 2010, JAP was not included in the management category, but ranked 1st in the Applied Psychology category. Scopus (SCImago, 2015) SJR index (the average number of weighted citations received in the selected year by documents published in the journal in the previous three years) indicates that JAP, AMJ, ASQ and OS ranked in the top five among empirical journals either in psychology, management or social science categories between 2009-2014.

method, unless some of the data were qualitative. This highlights a misconception often not well understood – simply including multiple sources of data does not necessarily constitute mixed methods.

The second reason for discrepancies was that in several instances, qualitative methods were used simply for preliminary or pilot efforts, for the purpose of developing a survey instrument; and then it was quantitative data alone that were utilized to develop or test theory. Taking heed of the intent in the call for papers for this special issue, that the purpose is to move our understanding of mixed methods "beyond simply having a main method and adding a bit of another method without integration," discrepancies of this type were discussed among the research team, and it was only if it could be agreed that both qualitative and quantitative data had been utilized in theory development or testing, that the paper was considered mixed methods. An example of this occurred in the categorization of Autio, Dahlander and Linus (2013). One coder originally surmised that the authors had used interviews only for survey development (which resulted in quantitative data used to test hypotheses); however, a more careful reading of the paper, along with discussion among the coders indicated that the interviews had also been drawn upon for interpretation and theory development, hence this piece was considered mixed method. In most instances where categorization was ambiguous, we erred on the side of considering the piece mixed method. So, like others before us, rather than dismissing an article if one of the two methods was "weaker," we considered it mixed method if theory development or testing resulted from its use (Molina-Azorin, 2007). For example, if media reports were content analyzed with a summary of occurrences, we considered this qualitative data that had been quantified, and if other sources of qualitative data were included, we categorized this as Type (4) mixed method/multiple sources.

Thus source of data (specifically single or multiple) was revealed as important during our coding process, for three reasons: (1) number of sources was sometimes confused with number of methods, (2) use of multiple sources was often a technique used to extend a single method study, and (3) number of sources was often a technique that helped to establish an emphasis on one method over another in a mixed method study. Interestingly, rather than discrete categories, the review demonstrates that the use

of multiple sources is a means by which emphasis on one method or the other can be achieved without negating the complementary strengths of the other method. We also noted that in some instances, the same authors were involved in multiple articles, all of which pertained to a common project. Each article may have used a single method, but across the articles, the project may have been mixed method. For example, one article may have reported on the qualitative portion of the project, while a second article may have presented a series of experiments. Although I focus here on the article as the unit of analysis, this is another intriguing alternative that I come back to in the discussion.

Results. As shown in Table 2, a meager 4.48% of the articles published in the four outlets (i.e., 69 articles out of the total of 1539 that were published across the four journals between 2009-2014) are of the Type (3) mixed method/single source or Type (4) mixed method/multiple source. Type (1) single method/single source and Type (2) single method/multiple sources, are by far the most prevalent during the period in question (together constituting over 95.52% of the articles published). Of the four journals reviewed for this article, the outlet most likely to publish mixed methods designs was *Administrative Science Quarterly*, with 13% of articles published during this period categorized as either Type (3) or Type (4). The outlet least likely to publish mixed method designs was *Journal of Applied Psychology*, with 1% of articles published categorized as either Type (3) or Type (4). Compared to prior reviews, this prevalence is lower than that reported previously, yet coincides with prior reports, when articles are only interpreted as mixed method if both methods contributed to theory development or testing.

Insert Table 2 about here

Approaches and Sources of Value

The aim of the second set of analyses was two-fold: first, to understand the approaches utilized in recent mixed method research, and second to understand what can be done to maximize the value of such research while minimizing the liabilities of it. To accomplish these aims, we conducted a thematic analysis of the 69 mixed methods articles published between 2009-2014, followed by an in-depth case study comparison of four papers (note that the 69 articles are denoted with an * in the reference list).

Approaches. As we read each of the 69 articles, we took note of how methodologies were combined, in what order and for what purposes. We began with the understandings from prior literature on mixed method research (see Table 1), but allowed for novel approaches that had not yet been elaborated upon in other reviews. Our aim was to reach a state in which the analysis was trustworthy, rather than to establish inter-rater reliability as described in quantitative analysis. Although some authors support the calculation of inter-rater reliability in qualitative analysis, other sources vehemently reject it. For example, Lincoln and Guba (1985) argue that because interpretive research implicitly assumes that every person conducting a research study will have unique interpretations of results, the concept of inter-rater reliability cannot be applied (see also Van Maanen, 1979). Instead, experts recommend that data trustworthiness be ensured by carefully maintaining records for data, notes, and codes, and by using peer debriefings, subject matter experts, and industry contacts to discuss codes, and to assess if the conclusions that were reached were plausible (Lincoln & Guba, 1985; Corley & Gioia, 2004). To this end, we engaged researchers uninvolved with the study to discuss emerging patterns in the data and to ask critical questions about the data collection and analysis procedure. We also asked an experienced qualitative researcher to help us assess the dependability of our data. The researcher examined our records (coding criteria, several categorizations, notes regarding discrepancies) to confirm the plausibility of our conclusions.

Five approaches emerged from the analysis: (1) qualitative analysis of experience followed by quantitative modelling of relationships, (2) quantitative modelling of relationships followed by qualitative analysis of experiences, (3) structural (network) analysis supplemented with qualitative analysis of experience, (4) content analysis of frequency patterns in qualitative data and quantitative modelling of relationships, and (5) case comparisons which drew upon both qualitative and quantitative data. The first two of these approaches corroborate prior reviews of mixed method research which emphasize the priority and sequencing of methods (e.g., Johnson et al. 2007; Molina-Azorin, 2012), but the other

approaches are more novel and have yet to be elaborated comprehensively in prior treatises. I first define each approach, and in the findings section I then provide illustrative examples.

The first approach supplements qualitative analysis of experience with quantitative data that are used to model relationships, allowing researchers to "check their interpretation of qualitative data, and to strengthen their confidence in qualitatively based conclusions when the two types of data converge" (Edmondson & McManus, 2007). Although this same sequence (qualitative followed by quantitative) was the most dominant discovered in prior reviews such as that conducted by Molina-Azorin (2012), where our findings diverge is that many prior reviews indicate that the quantitative portion of the study is more dominant (e.g., in his review, 108 of the 165 mixed methods articles in *SMJ* used a sequential design in which qualitative was conducted first, but the quantitative portion that followed was the dominant method). Yet the current review revealed an increasing number of articles in which the dominant method was qualitative. This approach was recently illustrated in the work of Barley and his colleagues (2011) examining the use of different media in organizations, as described below.

The second approach begins with quantitative modelling of relationships and supplements that with qualitative analysis of experiences, with the result being "a fuller explanation of statistical relationships between variables, ensuring in particular that the proposed theory constitutes a valid analysis of the phenomenon rather than artifacts of measurement. This approach also provides a deeper understanding of and rationale for a proposed new construct" (Edmondson & McManus, 2007: 1166). Again, prior reviews indicate the quantitative portion has primacy, with only one study categorized as having such a design with in which the qualitative portion came second and was dominant (Molina-Azorin, 2012). In contrast, the current review indicates the efficacy of such an approach, as illustrated in the article by Gardner (2013) discussed in detail below. I also note that the deeper understanding is not only reached for new constructs, but can also apply to existing constructs that are not well understood or documented, or for which there is substantial confusion or debate, as was the case with Gardner's concept of performance pressure.

Extending prior reviews of mixed method research, the analysis conducted here uncovered three additional approaches for mixed method designs not well elaborated in the literature. A third approach involves structural analysis to quantitatively document the network of ties among a set of actors or other entities using network analysis (Krackhardt, 2010), followed by qualitative analysis of interviews to uncover expectations and motivations of the actors or mechanisms for the relationships. This approach is illustrated by Toegel et al. (2013), discussed in detail below. I do note two interesting instances (McDermott et al. 2009; Sosa, 2011) in which qualitative analysis was followed by structural (network) analysis. In McDermott et al. (2009), ethnographic and interview-based analysis was conducted first, followed by network analysis of relationships among wineries and grape growers and their ties with associations, banks, technology suppliers, or other support institutions. In Sosa (2011) interviews were conducted with senior executives and group leaders, followed by network analysis of relationships among software developers in a European technology firm. Given these were fairly isolated examples, I simply note these as an interesting variant, rather than referring to this as a separate approach.

A fourth approach to mixed methods research involves content analysis in order to systematically uncover patterns of co-occurrences which appear in textual data, and then using this data alongside quantitative data to model relationships. Again, this approach was identified as rare in prior reviews (Molina-Azorin, 2012), but was evident in the current review and is illustrated below by the work of Bezrukova et al. (2013). A final approach involves case study or case comparison that includes both quantitative and qualitative data. This approach was utilized in only three instances during this period (Davis & Eisenhardt, 2011; Funk & Hirschman, 2014; McKendrick & Hannan, 2014), but we note it as a promising avenue for future mixed method research. Supplementing qualitative analysis of experience with quantitative modelling was the most common approach, represented in over half of the mixed method articles published between 2009-2014 (36 out of 69 articles).

Value-add. The second phase of the analysis centered on illustrating the primary value added by mixed method research, while also acknowledging the challenges. In addition to reviewing the 69 mixed

method articles, I selected four cases, based on the following criteria: (1) to illustrate each of the four most common approaches to mixed methods research that emerged during the qualitative analysis of the 69 mixed method articles, (2) to provide coverage across the four journals included in the review, (3) to encompass a range of methods (network, survey, interviews, case studies). The lead author of each case exemplar was interviewed by phone or by email. Interviews were semi-structured to allow for emergence of unique insights and probing of themes as they arose. Respondents were first asked to reflect on the article. Next, I asked the following questions: (1) What considerations helped you design the research? (2) Did you consider other approaches or techniques besides those included in the paper? (3) What was it that motivated you toward the approach you selected? (4) What do you see as the strengths of the approach? (5) Which aspects of your process proved to be critical features for success? (6) Were there aspects of the process that proved particularly difficult? (7) Do you have any words of wisdom to share regarding how to address these?

Interviews were transcribed and together with the articles themselves were subjected to multiple iterations of inductive coding, in which the three coders began with detailed line-by-line analysis to generate initial codes (open coding), most of which were in-vivo codes (i.e., verbatim terms used by the authors during the interviews, Strauss & Corbin, 1998). We then merged these into higher order themes. In accordance with the constant comparative method (Glaser & Strauss, 1967), we compared interview data with our own reading of the articles to examine whether they provided supporting or contrasting information. Second, interviews and our assessments were compared to develop the most prevalent codes for the article. Third, themes were then compared across articles, discussed among the coding team, and with peer experts in qualitative analysis, and finally, shared with authors of the case exemplars themselves (i.e., the interviewees). During these discussions further information and clarifications were obtained (and became part of the data), but in no case were the general conclusions challenged.

During this analysis process, four themes regarding the key assets of mixed method research were illustrated, corroborating but also extending points made in prior reviews: (a) elaboration, (b)

generalization, (c) triangulation, and (d) interpretation. *Elaboration* allows scholars to go deeper into a phenomenon than they would have been able to go, if they had used only a single method and single source. Prior reviews have emphasized that mixed methods provides opportunities for expansion (e.g., using different methods to assess different facets of a phenomenon, Molina-Azorin, 2012; Creswell & Plano Clark, 2011), but our cases revealed important insights about using mixed methods to develop depth, rather than breadth. *Generalization* allows scholars to document that findings occur in a variety of contexts, to ensure that results are not idiosyncratic to a particular context. Prior reviews have emphasized that mixed methods can increase conclusion validity (Johnson & Christensen, 2004), but our cases illustrated the specific instances in which mixed methods allowed for access into different contexts than would a single method. *Triangulation* allows scholars to document consistency in findings using different means of obtaining those findings, increasing our confidence that the findings are not driven by a particular method or data source. Prior reviews have mentioned the benefit of obtaining convergence about the same phenomenon using different methods (e.g., Creswell & Plano Clark, 2011; Molina-Azorin, 2012), but our cases extend this to emphasize the strategic value of multiple sources of data in conjunction with the mixed method approach. Finally, the fourth asset of a mixed method approach revealed in our cases, *interpretation,* allows scholars to provide additional insight into the meaning or implications of a finding (or pattern of findings) that was uncovered in one method or source, using another method or source. Prior reviews have noted that mixed methods may help to clarify results (Molina-Azorin, 2012), but do not emphasize the value for extracting meaning and extending theoretical implications. Next I illustrate these themes for adding value in the four cases.

Findings: Case Illustrations

Case 1: Qualitative analysis of experiences and quantitative modelling of outcomes

Stephen Barley and his colleagues (Barley, Meyerson & Grodal, 2011) examined how people use communication devices to construct their availability to others and manage their work lives. Specifically, they provided a theoretically nuanced understanding of the relationship between email use and stress by

showing that, "one cannot understand how media induce stress without considering how properties of technologies become entangled with social norms, interpretations, and the flow of daily work" (p.888). Most prior research had argued that e-mail creates extra work, in part, because its asynchrony allows people to send and receive work-related messages at any time. Yet, as Barley et al. (2011) point out, researchers had seldom investigated the social forces that shape people's experience of technologies.

Among a sample of 79 employees in a computer company, Barley et al. (2011) conducted 40 semi-structured interviews. They analyzed the transcribed interview data in multiple phases, following an inductive process that involved reading and coding the text numerous times (Lofland & Lofland, 1984). The initial phase involved reading through all transcripts to develop a general sense of the data, and creation of preliminary codes. During subsequent phases, they developed second- and third-level codes that captured the various ways informants used and talked about e-mail and other technologies. According to the authors, "These early analyses were invaluable in helping eliminate several lines of inquiry and focus our subsequent qualitative analysis on explicating patterns and relationships that appeared to be robust" (p.896). During a third phase, the authors coded the entire set of interviews using the previously derived codes, then met to compare codings, discuss discrepancies, and refine understanding of when a code should be applied.

Barley et al. (2011) collected quantitative data from two sources. First, respondents recorded in a log book all work-related communication activities that occurred during the course of two workdays, as well as that which occurred in the morning before they came to work, in the evening after they left work, and on one weekend day. Second, respondents completed a brief survey measuring which communication devices they used, stress (i.e., the emotional exhaustion subscale of Maslach and Jackson's (1981) burnout inventory), and coping (Families and Work Institute, 1992). Variables capturing the outcomes 'time worked,' 'overload,' and 'coping' were constructed from these two quantitative sources. Quantitative analysis techniques included hierarchical, ordinary least squares regressions to

assess whether being a manager, the number of communication events employing various media, and the time spent using various media influenced the length of respondents' workdays, overload or coping.

The final phase of their analysis was critical in combining the qualitative and quantitative data (Barley et al. 2011: 896):

> "we identified patterns and relationships in the interview data and triangulated those against the quantitative data from the survey and logs.… All analytic memos included… exceptions to identified patterns, which led to additional analyses that helped us understand the reasons for the exceptions. We triangulated the patterns and tentative theories that emerged from these analyses with the quantitative data, which enabled us to explore further, affirm, and sometimes refute our understandings. Similarly, when our quantitative analysis pointed to relationships between variables, we turned to our interview data to deepen our understanding of these relationships."

Barley et al. (2011) discovered that because of e-mail's features, and the norms and meanings associated with its use, informants blamed email for the stress they experienced. This was true regardless of the amount of time they worked and regardless of the fact that other communication activities also contributed to their workload and the stress they felt. As the authors state, "In short, email was not just a source, but also a symbol of overload," even though the quantitative data showed that other media also contributed to feelings of overload. Interviews revealed that processing email increased informants' sense of being able to cope with their work. Hence, the mixed method approach allowed them to make sense of many contradictions, which would not have been evident nor made sense of, if only a qualitative or quantitative approach had been utilized.

This example illustrates that *elaboration* was enabled by the mixed method approach, in that the quantitative data allowed the authors to uncover sources of stress that were not revealed in the qualitative data. Further, the quantitative data collection involved a wider number of respondents across a greater part of the organization, indicating that the findings were *generalizable*, not just unique to the small subset of the organization included in the qualitative study. *Triangulation* was obtained, in that numerous patterns in the qualitative data were confirmed in the quantitative data, lending additional confidence that the interview process did not "manufacture" the results. Finally, the example illustrates

increased capacity for *interpretation* in that, through the additional data, it was understood that these added sources of stress were not in the foreground of informant's accounts, yet served a symbolic role.

At the same time, reflections from the lead author indicate a variety of challenges. First, he noted that scholars may have the best laid plans for a mixed method study, only to find that planned data sources are not available, or that the organization serving as the field site will agree to one method, but not another. In this instance, obtaining the communication logs was a first step, but then subsequently gaining permission for interviews and a survey was an even bigger "ask." With regard to the analysis, Barley commented that mixed method studies can be very time consuming (he estimated that the analyses unfolded over three years on this paper), for many reasons, but chief among them is that sometimes results across methods are inconsistent, and the researchers must then decide how to proceed when newly derived patterns don't make sense. For example, Barley explained that in this study, the quantitative data didn't support what people were saying in interviews (as much as he thought it would): "There were other things that were troublesome to these people (that turned up on the survey), other than email, but email was all they talked about, and so we had to figure out why." This meant exploring alternative framing to arrive at a new focus. He also described having to learn new analysis techniques in order to aggregate data to the level necessary for full understanding, given the anomalies. Finally Barley commented on the difficulty in publishing mixed method research: "The first version had hypotheses, and we got trashed for having them. So we got rid of them. We re-wrote the paper, but then we got all kinds of push back about the combination of the logs and the qualitative data from the interviews. And they didn't like the regressions where we had the stress scale involved alongside the other types of data. I remember that I was mad enough to kill! But we did overcome it."

Case 2: Quantitative modeling of relationships combined with qualitative analysis to uncover mechanisms

Gardner (2012) was interested in how performance pressure, defined as the importance of a team delivering superior outcomes, affects team knowledge use. Prior research had indicated that on the

one hand, high-pressure projects can cripple teams, resulting in members' psychological withdrawal from the task (Pearsall, Ellis, & Stein, 2009); on the other, it also suggested that high pressure situations can provide contexts for teams to create and use their knowledge (Cannon & Edmondson, 2001). Gardner's (2012) study involved collecting quantitative data pertaining to 72 audit and consulting teams from a global Big Four accounting firm, including a client survey to measure team performance; a survey regarding performance pressure completed by senior partners; and a survey with team members regarding their own and other members' effort, as well as existence, recognition, and use of general and domain-specific expertise.

Results of hierarchical OLS regression showed that as performance pressure increased, team members overly relied on general expertise, while discounting domain-specific expertise, leading to suboptimal performance. Interestingly, contrary to her prediction, quantitative results also showed that use of general professional expertise did not enhance team performance. In true iterative spirit, Gardner (2012) explored why that might be the case with follow-on interviews with clients, who reported that when they hire a Big Four accounting firm, they expect project teams to have sufficient general professional expertise. But for a client to be very highly satisfied, the team must customize its work; and the more critical the project, the more this is important. This customization requires domain-specific expertise. Yet, when the teams needed domain-specific knowledge the most, they tended to use it the least!

In the third phase of the research, she sought to uncover specific group processes involved in this paradox. According to the author, "I designed my follow-up study as a combination of team observation and interviews to explore the behavioral mechanisms that underpin knowledge-suppression effects in teams, rather than to confirm or disconfirm hypotheses" (2012: 19). Specifically, she conducted case studies of six project teams across two firms, following each team through its entire project (three to ten weeks), observing at least one team meeting per week. This allowed her to understand how performance pressure varies at different phases of a team's project, capturing more

fine-grained data than the surveys allowed. To determine the level of performance pressure in each meeting, she extracted relevant passages from meeting notes and assigned a score on a 7-point scale. Finally, she coded the source material to indicate the two types of expertise, categorizing team members with the highest level of each type of expertise.

Analyses also consisted of mapping knowledge-use behaviors of team members under different levels of performance pressure, overlaying role assignments onto team members, and evaluating how behaviors affect expertise contribution and use. She uncovered four team processes that seemed especially strongly associated with team-knowledge use behaviors under performance pressure: (1) heightened drive for consensus, (2) increased propensity to focus on common knowledge, (3) switch in priorities from learning to project completion, and (4) emphasizing conformity to members' position in the team's hierarchy.

In uncovering these findings, the mixed method design allowed *elaboration* upon a more comprehensive conceptual model to guide future research on teams' knowledge use and effectiveness, highlighting the multidimensional nature of task-relevant knowledge. *Generalizability* was increased, in that although the survey was only drawn from a single firm, quantitative findings were mirrored with the qualitative data, which was drawn from a considerably different professional service firm. *Triangulation* was evident in that the qualitative findings replicated the pattern found in the quantitative data, that teams rely on general professional experts more than on domain-specific experts under higher performance pressure, but it also helps us understand how this process unfolds, hence elaborating on what was found with the quantitative data. Finally, depth of *interpretation* was achieved, in that the qualitative data showed that team members of all role types initiated, accepted, and reinforced the full range of knowledge-use behaviors; there was no clear pattern suggesting that the general professional expert or the domain specific expert was more or less responsible for the way the team used knowledge. Such insight could not have been gleaned from the survey alone.

Gardner commented on a number of challenges in this project, including needing access to increasingly more sensitive data as time passed in the project. She described a process of continually providing feedback at each phase as a means of relationship building. Perhaps the most salient challenge was the difficulty in "marrying up" the different types of data about each construct. For example, mid-way through the project, she had to find a credible way to categorize each meeting's level of performance pressure based on the observational data, and she ultimately used some ancillary data that she hadn't initially been sure were valuable in order to do so (i.e., notes about each meeting context based on discussions and observations before the team's official meeting began). This highlights the resourcefulness that is often required in conducting mixed method research.

Case 3: Social network analysis combined with comprehensive interviews

Reviewing the literature on social exchange and leader member relationships, Toegel et al. (2013) found little to explain why and how mangers engage in the process of helping subordinates with their negative emotions. To address these issues, Toegel et al.'s study was guided by four research questions (2013: 337): (1) do managers actually incorporate the emotion-helping function in their behaviors? (2) what motivates managers to engage in the potentially unpleasant task of intervening in the management of others' negative emotions? (3) is emotion helping seen as in-role or extra-role behavior by those providing the care and those to whom it is provided? and (4) do different types of emotion helping prompt different outcomes from discrepant interpretations on the part of managers and subordinates?

They answered these questions in a sample of 67 employees of a recruiting agency that specialized in providing managerial staff to retail outlets. First, they collected social network data concerning who went to whom for emotion help with negative emotions. They calculated homophily, that is the extent to which people nominated same-category others as those who helped manage and alleviate their emotional distress. In a second phase, they conducted 30 semi-structured interviews asking participants to tell about a situation in which they experienced stress, anxiety, tension or emotional pain. Analysis progressed from extracting instances concerning incongruent expectations and reciprocity,

which they characterized as "informant sensemaking" to then comparing data from different interviewees to develop higher order analytic dimensions (Van Maanen, 1988), and finally arriving at more general emergent themes useful for building an emergent theoretical model.

They found that emotion help was provided because managers thought that organizational and economic benefits would accrue from helping others cope with their negative emotions, or because they felt it was an important skill that could be used in other areas of life. Most provided the help because they thought they would gain something back from the provision, specifically recognition of their efforts from subordinates. Perhaps their most interesting insight pertained to the incongruence in expectations. As they state, "employees treat caring as part of the mangers' role that requires no reciprocation, whereas managers see such help-giving as discretionary extra-role behavior that requires reciprocated commitment" (Toegel et al., 2013: 334). Disconfirmation of the managers' expectations resulted in anxiety, insecurity, and helplessness; whereas for employees, it diminished trust in the supervisors.

The mixed method design utilized by Toegel et al. (2013) enabled *elaboration* on the social exchange literature, illuminating a curious incongruity, as stated by the authors "that helping behavior designed to ameliorate negative emotions may itself generate negative emotions on the part of managers waiting in vain for employees to replay their kindness" (p.350). The mixed methods were instrumental for increasing *generalizability*, because they enabled derivation of more general themes that are likely applicable even outside this particular set of network actors, beyond the service sector. The interviews also enabled *triangulation*, which would not have been as compelling had interviewees not commented directly on the importance of the level at which the help had been provided. Finally, their pairing of the social network data with interviews also enhanced *interpretation* of the patterns uncovered in the network analysis, which may have been elusive without greater understanding behind the motivations for provision of help uncovered in the interviews.

Toegel reflected on the challenges of this research. She mentioned that unlike single method studies, in which participants are approached only once (or in the case of archival data, may not be

approached at all), employees in this study were approached multiple times by the researchers. One employee commented, with a bit of irony "Is there a third phase of your research?!" Hence, there is the danger of respondent fatigue which is not as prevalent in other research designs. To combat this, the research team were clever in offering feedback on network centrality to employees following the network data collection, which increased the motivation of people to participate and strengthened the relationship with respondents to enable more candid conversations during the interviews. Toegel also commented on difficulties during the review process, similar to those noted above by Barley. At least one reviewer was not enthusiastic about the inclusion of the network analysis, but Toegel and her team were adamant that it enabled a deeper interpretation, and were insistent with regard to retaining it in the paper. The dramatic benefits of pairing these different methods shows that this persistence paid off.

Case 4: Content analysis combined with quantitative survey data

An insightful paper by Bezrukova, Thatcher, Jehn, & Spell (2012) provides yet a different example of the means by which qualitative and quantitative data and analysis techniques can be combined. The result was richer and also more discriminating analysis and important contributions to the diversity literature. The authors examined the effect on performance of a specific type of group split: informational faultlines (members' alignments based on skill, knowledge, and expertise). A key contribution of this piece stems from the ingenious qualitative approach to capturing a condition that may alter the direct effect of faultlines – specifically the group and departmental cultural environments which provide contextual influence on the groups. As the authors state, in doing so, they were able "to integrate the literature on faultlines and organization-based culture by theorizing about the specific content of cultures (results-focused), recognizing the multilevel nature of organizational cultures, and showing how cultural alignment across organizational levels may operate as a moderating variable that influences performance in groups with faultlines" (p.85). Specifically, their findings demonstrate that although informational faultlines were detrimental for group performance, the negative relationship between faultlines and performance was reversed when cultures with a strong emphasis on results were

aligned; was lessened when cultures with a weak emphasis on results were aligned; and remained negative when cultures were misaligned with respect to results orientation.

Uncovering this finding would not have been possible without their mixed methods approach. To capture group-level results-focused culture, company guides were content-analyzed to understand the extent to which results-focused values were expressed (e.g., see Abrahamson & Hambrick, 1997; Kabanoff, 1997). The number of times a results-focused value (e.g., "competitive thinker," "results driven") had been mentioned as being representative of the group was counted. Next, a measure of department-level culture was generated by content-analyzing 5,844 pages of archived open-ended text responses contained in employee surveys. Key terms representing a results-focused culture were systematically derived by multiple raters, excerpts containing these words were extracted (several lines of text occurring before, during, and after a search term). Following the procedure of Gibson and Zellmer-Bruhn (2001), the raters scored each employee response included in the analysis by counting the number of search terms that occurred in the response. To control for differences in the number of words across responses (the greater the length, the more likely that a given term would appear), they further divided the number of occurrences by the total number of words in the response. "In-context verification" was performed to ensure that the words were used as suggested by the results-focused culture definition.

Quantitative data captured faultlines using the algorithm developed by Thatcher et al. (2003) and used in by others (e.g., Bezrukova, Spell, & Perry, 2010), based on multivariate statistical clustering analysis (e.g., Jobson, 1992; Sharma, 1996). Group performance was measured using group stock options and group bonuses. Three-level hierarchical linear modelling (HLM3; Bryk & Raudenbush, 1992; Raudenbush, Bryk, Cheong, & Congdon, 2000) was conducted, given the hierarchical structure of the data with observations at one level of analysis (individuals) nested within a second level of analysis (groups) and within a third level of analysis (departments).

Utilizing the qualitative approach to understanding the cultures enabled *elaboration* upon the boundary conditions for faultline operations. The piece is also a good example of *triangulation* and

generalization assets of mixed method research. As the authors point out, their approach is not plagued with percept-percept bias. The practical implications from the research were also well-grounded in the richer understanding of context that resulted from their research design. They suggest strong leadership may result in a cultural alignment throughout various organizational levels that can help to leverage demographic-based faultlines that are prevalent in the current workforce. This can be accomplished either in formal ways (such as letters or memos) or through socialization tactics—where group members experience common learning with other groups in their department. Finally, by taking care to represent cultures qualitatively at two different levels (group and department), using two different sources of qualitative data, *interpretation* was enabled – the authors derived the notion of alignment across the two levels as key for faultlines. This interpretation may not have arisen without the qualitative/multi-source data (e.g., had they only obtained information about culture from one source).

Reflections from the lead author, though, did reveal some challenges. Like Barley and his colleagues, Bezrukova and her team found that often companies provide "random data and you have to make the best out of what you get. In our case, we were lucky and were provided with multiple data sets that could be merged since they had subsets of the same employees represented in each dataset. Mixed methods were a solution to this." Equally important in their case was perseverance and use of an iterative approach. At the same time, she also commented on how important it is to apply the mixed method approach in those instances where the theoretical contributions are potentially very strong. She mentioned that reviewers considered the mixed methods a strong aspect of the study since it had the potential to tell so much about cultural alignment across different levels.

Discussion

Based on this analysis and drawing from the personal reflections obtained from the authors of the case examples, the value of mixed method research is clear. Authors of these studies viewed their combination of qualitative and quantitative data as instrumental for their deep elaboration on phenomenon that would have been hidden without the use of mixed methods, for increasing

generalizability across contexts and cases, for triangulation across evidence and instances, and for interpreting complex patterns that would have remained coarse or somewhat superficial otherwise. Although these features may not be equally important to all researchers (e.g., non-positivists may not embrace generalizability or triangulation to the same extent as those with a positivistic approach), the articles reviewed here illustrate that they are potential assets of the mixed method approach. Further, the four lead authors commented that these assets increased the rigor and impact of the research. By impact, they reiterated several of the indicators mentioned in the literature, including 'advancing understanding and knowledge' and ability to 'influence or contribute to improvements in practice.' Yet mixed method research is not a panacea, and it is not without its challenges. Indeed, as mentioned previously, the appropriateness of any design depends on many potential factors, including the maturity of the domain of study, question being asked, and objectives of the researchers. And whether value will be realized is certainly contingent on the extent to which the research is conducted systematically, ethically, and in a technically appropriate manner. Corresponding to each of the ways in which mixed methods adds value, the lead authors mentioned tensions and struggles around these issues. Below, I offer a series of recommendations to combat these challenges (summarized in Table 3).

Insert Table 3 about here

Enhancing Elaboration in Mature Domains

In designing research, scholars often seek to select a method that will enhance scientific and practical contributions, while at the same time minimizing threats to rigor, and balancing time, effort, and resources. Prior reviews have emphasized the choice amongst quantitative, qualitative or mixed methods, indicating that mixed methods are particularly appropriate where the goal is to increase validity of new measures or to generate greater understanding of the mechanisms underlying quantitative results in at least partially new territory (Edmondson & McManus, 2007). Less insight has been offered regarding the use of mixed methods in mature research domains. Extending prior reviews, comprehensive analysis of the various approaches in the 69 mixed method articles revealed that *even fairly*

well documented and mature domains of organizational research can benefit from a mixed method approach that is finely tuned to elaborate on shortcomings in prior construct or model development. One of the primary reasons the elaborate deep-level theoretical contributions are possible is that the specific mixed method approaches selected fit the research questions being asked. It wasn't just a matter of recognizing that mixed methods would be stronger than a single method, rather the specific mixed method approach was critical in order to obtain the necessary theoretical contributions for a given set of research aims.

For example, Bezrukova et al. (2012) addressed a research domain (fault lines) which has received a tremendous amount of attention in the last ten years using both qualitative and quantitative methods. Specifically, fault line operationalization has reached a very high level of quantitative sophistication. As a result, if Bezrukova et al. had utilized an inductive initial approach, their insights may have yielded little additional theoretical development beyond the current state of the literature. Focusing on the boundary conditions for faultline effects, the approach they developed, in which text data were qualitatively analyzed, and then quantified for use alongside the sophisticated quantitative fault line operationalization, allowed for the set of theoretical extensions they sought. Their research is notable because very little is known about how cultural environments may shape the relationships between group faultlines and outcomes. Presumably, one of the stumbling blocks to exploring this issue in the past is that cultural environment is difficult to capture empirically, and even more challenging given that multiple cultures must be captured, if variance across group faultlines embedded within them is to be examined (which is important for linking these two constructs). While it might be less onerous to document a single cultural environment richly and deeply, to do so across 138 groups (as did these authors) is nearly an insurmountable task. Hence the content analysis approach to mixed methods design was an excellent solution. The possibility of utilizing this approach in such a way extends prior reviews (e.g., Greene et al. 1989) that indicated it may be helpful to use naturalistic qualitative methods to assess context first, and then use positivist quantitative methods for other purpose later in the study. Bezrukova et al. applied a different type of qualitative analysis (content analysis) simultaneously with

their quantitative approach to understand context, and they did so in a relatively mature research domain (i.e., team fault lines), extending it in new and exciting ways.

As another example, Barley et al. (2011) initiated their project because they were sceptical that the role of communication technology can be revealed simply by noting patterns of use. Instead their research questions pertained to the social norms and interpretations surrounding use. Given this question, it made sense that qualitative data were needed to induce the potential symbolic aspects of use. As the authors themselves note, "Combining both types of data is valuable because it not only allows one to confirm common findings across methods (Jick, 1979), but just as importantly, one can identify dynamics obscured by one data source or another (Bernard et al., 1985)." Analyzed alongside the interviews, the quantitative data documented patterns of use and provided a direct measure of stress that helped the authors to point to sources of stress that were not emphasized in the informant's interview accounts, because (according to the authors) "they were not figural to their work culture." It also allowed the authors to uncover the seemingly contradictory evidence among respondents that although email was "all they talked about" there were other things on the survey what were troublesome to these people, thus highlighting the symbolic nature of email. Prior reviews have indicated that mixed methods can used with the explicit intent of uncovering paradox and contradiction (referred to as the purpose of 'initiation' by Greene et al. 1989), yet have also noted this is rare. In fact, Barley did not indicate this was an explicit purpose, rather that it emerged as the analysis unfolded.

Toegel commented that being very clear about what the analysis across methods is designed to achieve can be critical – is the emphasis on elaboration, interpretation or triangulation? In her case, it was on elaboration of findings that were difficult to understand purely on the basis of the social network data, and this guided her interview protocol and qualitative analysis techniques, it also implied that the qualitative data collection and analysis should occur following the network analysis. This departs from some recommendations that have appeared in the literature, which indicate that if 'complementarity' is the goal (i.e., using the results from one method to elaborate, enhance or illustrate the results from the

other) then the mixed methods should be used simultaneously (Green et al. 1989: 266). Such an approach would not have worked for Toegel et al., whose insights were made possible specifically by the sequence of the design. Generally there has been recognition in the social network literature of the importance of understanding the psychology that undergirds ties (see Casciaro et al. 2015 for a recent perspective on this). But gaining this understanding likely requires mixed method approaches, and as Toegel et al. have demonstrated, in particular supplementing traditional network analysis with inductive techniques can be fruitful, but necessitate a very different skill set and frame of mind. The key lesson here is that even in mature research domains, elaboration on phenomena that could be hidden by a single method is made possible using mixed methods, and this is contingent on selecting the approach to mixed methods that enables this, given the particular research aim.

Utilize Iterative Processes to Expand Access and Improve Generalizability

Moving into data collection, the gaining of access to firms, teams, respondents, or data is often the bane of researchers' existence and many would soon have it over and done with as quickly as possible. Many research design handbooks indicate that data collection should be strategic and pre-formulated and conducted according to plan (Tashakkori & Teddlie, 1998; 2003; 2010; Teddlie & Tashakkori, 2009), although several do acknowledge that emergent designs might be viable, these are not as well elaborated (Creswell and Plano Clark, 2011). The analysis here revealed, however, that often *important knowledge comes from unexpected sources during the process of conducting mixed method research and iterative, negotiation, and relationship-based techniques are essential for improving access and generalizability, and more generally, ensuring rigor and impact*.

The authors interviewed all indicated that it is important for researchers to remain open to insights and data sources, even they are not be part of the original design. This is part and parcel of a proximal approach to theory building (Gibson et al., 2012), hence the reason mixed method designs may be particularly well suited for such endeavors. For example, Gardner advised that researchers suspend assumptions while in the field about what data might be crucial, remaining open to collecting and

utilizing data, even from unanticipated sources, given it might prove valuable later in the process. Drawing upon the metaphor of a powerful vacuum cleaner, she claims her motto in research since the project described here has been, "Hoover up all the data I can get my hands on while it's available."

The research teams I have participated in have gleaned similar insights. For example, in one project we planned to collect data using interviews and longitudinal surveys. As part of our relationship building phase with the site, we were invited to attend a face-to-face meeting. Doing so initially seemed outside the scope of our research purview. However, upon accepting the invitation, we realized that attending such meetings constituted a valuable ethnography that could reveal phenomenon not likely to be illuminated in the interviews or surveys, hence we requested and received permission to attend all such meetings during our research process, even travelling overseas in order to do so. In the end, the most valuable comparisons were made during the ethnography, allowing us to extend our findings to include non-domestic operations and intercultural issues within an expanded scope of theory building, as well as to deliver important feedback to the firm's headquarters about regional challenges faced by study participants. It should be noted that remaining open to data sources is not the same as the 'paramedic' use of mixed methods described by Greene et. al. (1989). In their analysis of articles published in educational science, they noted that "qualitative data often appeared the emergency room of report writing as a life-saving device to resuscitate what was either a failed program or a failed evaluation" (1989: 269); yet they also argued that mixed method studies had not yet tested the limits of their potential and suggested a more integrated approach. Authors in our examination appeared to have heeded this advice, in that the openness to data and resulting mix of methods wasn't intended to "fix" problematic results, but rather in order to expand explanations and create a deeper understanding.

Several of the lead authors mentioned that being able to navigate between the worlds of academia and practice was instrumental, as was being willing to provide feedback and consultation to respondents during the project. Gardner described a process of starting with a small request (e.g., interviews with some relatively junior professionals), and then using what she learned from that to

inform the senior client contact, such that he saw the value of the study and then advocated for her to get access to several executives. She then used insights from those interviews to persuade them to conduct team surveys in their divisions. As Gardner commented, "I never asked them for access to new data sources until I had a fresh insight I could share with them from my ongoing research. Ultimately, they granted me access to their clients, which is extremely delicate."

Barley suggested that gaining such access often involves negotiating sample size for subsequent phases of the study. If analyses are to be triangulated across methods, this may require matching participants from phase to phase, hence the entire study may end up with a smaller sample across methods. Yet, such a compromise is likely worthwhile. As the Barley et al. (2011) piece illustrates, being willing to accept the smaller sample overall allowed for quantitative and qualitative data for each respondent to be compared, hence increasing the trustworthiness of the data, while still maintaining breadth across the organization.

Coordinating and synchronizing multiple data sets mean that logistics and project administration become critically important. Bezrukova recommends careful protocols for labelling and storing data sets. She also notes that given mixed methods often mean the merging of data sets, if one anticipates using a mixed method approach, it is helpful to know some programming language (e.g., SQL), or to invite someone to join the research team who does. Other tactics such as keeping an updated data dictionary with information on data format are also helpful. Bezrukova explained that these techniques are particularly necessary when conducting mixed method research to be sure that results are reproducible. Likewise, Barley suggested attention to these details before embarking on the research in order to be efficient during the analysis process.

Equally important is building a team with a variety of methodological expertise, and revisiting with discussions among the team the emphasis placed upon, and insights provided by, the different methods at numerous junctures. The importance of planning research team composition and methodological skill breadth was emphasized by Hurmerinta-Peltomaki and Nummela (2006), but

Bezrukova also emphasized the importance of an iterative approach, in which findings from one phase inform the data collection and the addition of research team members for subsequent phases, ensuring greater interpretability across the project. This approach was corroborated by Barley, who suggests using specific, concrete findings from one method to inform explorations that can be continued with a different method. In his project, instances recorded in the communication logs informed specific questions the researchers asked of those respondents during interviews, hence they deviated from a structured interview protocol to help solve the puzzles that arose. The prescription here is that impact on both knowledge generation and practice can be increased if negotiating access and designing data collection strategies are ongoing processes, informed by emergent insights, with generalizability in mind.

Obtain Triangulation Through Shifts in Sequence and Unit of Analysis

As they reflected on the analysis phase of research, many researchers lamented the difficulty in developing consistency across methods, yet obtaining triangulation is often an explicit goal of mixed methods research! Triangulation is less precarious in the approaches that involve content analysis and quantification of text data, and in the case comparisons. These approaches share aspects of what Creswell (2003) referred to as 'concurrent designs,' and those categorized by Molina-Azorin (2012) as 'simultaneous,' which involve collecting both forms of data at the same time and then integrating the information in the interpretation of the overall results. Yet determining the order and priority when methods are sequenced may be more challenging. The interviews and examination of articles here revealed a number of *strategies to achieve triangulation by expanding the analytical options, including decoupling the sequence of analysis from the sequence in which data was collected, shifting the unit of analysis, and revisiting the literature to help inform analysis.*

Frist, researchers may need to re-consider the sequencing of their analysis as it unfolds. Although one may design a project to begin with collection of one data type followed by a second data type, it may be that the data collected first are most useful for theory development if they come into play later in the analysis. This process is different than the 'emergent mixed method design' described by

Creswell and Plano Clark (2011), which occurs when a second approach (quantitative or qualitative) is added after the study is underway because one method is found to be inadequate. Rather, interviewees indicated that a mixed method study may be designed with a particular sequence in mind at the outset, and the order of data collection may have a particular intent, but the usefulness of the data might change during the analysis process necessitating a re-sequencing. In fact, beginning analysis with the data that were collected first (in time), just because that was the sequence of data collection, may make triangulation more difficult.

For example, it is interesting to note that although Barley et al. (2011) collected quantitative data first, their analysis began with the qualitative data (hence our coding of the article as "Qual-Quant"). They first identified patterns and relationships in the interview data, and then triangulated those against the quantitative data from the survey and logs, noting the areas of discrepancy as potentially ripe for theory development. This suggests that researchers should not be shy about re-ordering the sequence of analysis based on an emerging sense of the findings, even if the analysis sequence then differs from the data collection sequence. So decoupling the sequence of data collection from the analysis, and then shifting back and forth between types of data analysis is a technique for achieving triangulation. Although they collected surveys and interviews sequentially, Barley et al. (2011) reported "teleporting back and forth among the qualitative data, the quantitative data, and emerging categories and relationships" (p. 893). Hence although they described 'phases of the analysis,' they note that the analytic processes that characterized each phase were rarely confined to that phase.

Gardner indicated that analysis is even more challenging in mixed method, multi-level research, as findings obtained at one level or with one method, may not coincide with those at other levels achieved with different methods. Addressing this issue may require shifting the focal unit of analysis, which in her case became the team meeting. As a result of very similar issues, I am currently working on a mixed method project which has required shifting the unit of analysis from the team, to the transitions that each team makes in their activities over time. Given each team typically makes 3-4 such identifiable

shifts each year, analysing the transitions is more appropriate for the dynamic focus that has emerged in the piece, and it increases the number of observations. But it also requires a shift in the conceptualization and theory development, because the emergent theory becomes one of transitions, as opposed to being centered on the team. Finally, it requires multilevel modelling techniques, which have different parameters and constraints. So a very practical lesson from these design challenges is that value can actually be maximized if researchers remain open to such shifts, even if they are as dramatic as changing the unit of analysis.

Coinciding with openness in analytical approach, researchers will need to be willing to revisit the literature as they are conducting analysis. As Gardner describes, initially she generated a set of descriptive codes from prior research to categorize segments of text according to certain classes of phenomena. Next, she assigned interpretive codes to data units, reflecting a deeper understanding of the situation dynamics and to offer additional insight in to the initial codes; this meant "modifying the list of descriptive codes to capture additional actions embedded in the sequences of action"(Gardner, 2013: 21). She then analyzed the coded data to uncover behavioral patterns across larger passages, which depicted how initial codes fit together. As she put it, "I sought meaning in the patterns as it related to my research question…I iterated between the data and existing small groups research to understand how data units fit together into meaningful processes" (p.23). This process of moving between literature, data, and emerging theory may be foreign for those accustomed to a more deductive approach, and if the research team consists of members having different comfort levels with it, negotiation within the research team will be necessary. In summary, important prescriptions for achieving triangulation include being willing to shift unit and order of analysis, as well as revisiting the literature during analysis.

Including Benefit of Mixed Methods to Fortify Interpretation for Publication

Finally, several researchers commented on the publication process, and that incorporating strategic framing about the value of both qualitative and quantitative methods within the submission itself and during the review process can be critical for winning over "purists" who discount one method

or the other. The key is to emphasize how the combination of methods lends itself to deeper, novel, or more useful interpretations. Although handbooks on conducting mixed methods research sometimes provide guidance on the structure of a writing a mixed method article, they rarely address this aspect of the publication process in much detail. For example, in a very helpful section on Writing and Evaluating Mixed Methods Research, Creswell and Plano Clark (2011: 262) suggest including reasons that mixed method research is appropriate to address the research problem, but the analysis here extends this to suggest the *strategic framing of findings to illustrate the depth of interpretation made possible by mixed methods, both within the article itself, but also during the submission and revision process*.

For example, Gardner was able to refine the construct of performance pressure through her iterative, mixed method approach, and she emphasized this aspect of the findings in order to convince both reviewers and readers of the value of such designs. As she stated, "Combining the results [from the qualitative study] with my survey findings allowed me to develop a more comprehensive conceptual model of performance pressure's effects on team processes and outcomes…my findings highlight an irony of team life: when teams are under pressure to perform at their best – and even when they are motivated to do so – they engage in behaviors that actually constrain their performance" (p.32). Mixed methods appear to be particular justifiable when such ironies, counter-intuitive findings, or innovative juxtaposition are revealed during the interpretation process. For example, having the insight to pair interviews with the network analysis enabled Toegel et al. (2013) to illuminate the prevalence of behaviors that are relatively superficial (e.g., listening and giving advice); this was novel given prior research has suggested that social support and concrete help and assistance are critical. It is highly unlikely that this would have surfaced without the in-depth personal interviewing techniques the authors employed. Being able to emphasize in the article itself that such insights were only possible due to mixed methods made a strong case for an article that utilizes such methods.

Interviewees also commented on the need to persevere when one has a strong case for the value of the mixed method approach. Gardner described how she initially failed to convince one reviewer on

the merit of the qualitative study, but that s/he came around by the second revision: "If I hadn't been so personally passionate about the idea, I may have been tempted to listen to his advice." Seeking encouragement from others who have made the journey to publication successfully using a mixed method approach can help to address this challenge. For those who aim to pursue mixed method research, Barley advises the following, "If your analyses are empirically viable, you have been thorough and careful, and you get a review that is driven by a reviewer's religion (methodological or theoretical), you need to stand up for your work. Sometimes you will get rejected, but often you will get a receptive audience." As he described it, during his review process, the methodological purists discounted the qualitative data, because they had included quantitative data. Eventually, they saw the publication through to fruition, but the key was in demonstrating that the combination of the two methods added value to the interpretation, and subsequently to the impact of their contribution, in terms of adding insight and building new knowledge.

Often, the balance between depth and breadth across methods and levels is precarious. It may be impossible to conduct as deep an analysis as might have been optimal for each type of data in one paper. To address this, it is helpful to consider what the primary data sources are, provide depth around analysis of those data, and then utilize the secondary data sources in a less elaborate manner. Another strategy alluded to earlier, is that authors might consider publishing each method separately in different papers. The project is mixed method, but any given article from the project becomes single method. Yet, this prohibits the aim of increasing elaboration or interpretation within a single article, and relies on readers' willingness to read multiple articles, which may not be available simultaneously (e.g., in the same publication year) or in the same outlet. Hence, the reason I focus here on mixed method articles.

In my own publishing efforts using mixed methods, an important key to success has been to focus on what is revealed by one method that would have been obscured without the other. Quantitative scores often do not reflect the "shades of grey" that comprise the actual experience of work by respondents, and qualitative evidence can provide these interpretations. Explaining these nuances

requires a very comprehensive understanding of the current state of the literature, so that one can have confidence in the novelty of the findings, to strengthen the case for mixed methods. Scholars have offered suggestions for a variety of means of integrating quantitative and qualitative data, including using data analysis software or using metainferences (Teddlie & Tashakkori, 2009; Johnson et al. 2007). Likewise, our interviewees indicated the criticality of integration for publication success.

In conclusion, mixed methods offer great potential for increasing rigor and impact, yet remain rare in the organizational literature. Increasing the representation of mixed methods research is a matter of proactively addressing the challenges and practical liabilities of such designs, even before embarking on the research, but equally importantly, remaining open to a dynamic and emergent approach during the data collection, analysis and publication process. Doing so enhances the value of mixed methods for organizational research.

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Table 1. Definition, Purpose and Approaches For Mixed Methods Research in Prior Literature

Authors	Core of Definition Of Mixed Methods	Purpose of Mixed Methods	Approaches to Mixed Methods
Creswell & Plano Clark (2011)	"Collects and analyzes persuasively and rigorously both qualitative and quantitative data" (p.5)	Provides a better understanding of research problems than either approach alone; in particular those problems in which one data source may be insufficient, results need to be explained, exploratory findings need to be generalized, or a second method is needed to enhance a primary method, a theoretical stance needs to be employed, and an overall research objective can be best addressed with multiple phases or projects (p.8)	Six prototypical designs: (1) convergent (concurrent qual and quant); (2) explanatory (quant followed by qual; (3) exploratory (qual followed by quant), (4) embedded (collection of supporting data), (5) transformative (design that specifically advances the needs of underrepresented or marginalized populations), (6) multiphasic (combining other approaches over multiple phases)
Edmondson & McManus (2007)	"Hybrid methods mix qualitative and quantitative data" (p.1155)	The two methods can be successfully combined in cases where the goal is to increase the validity of new measures through triangulation, or to generate greater understanding of the mechanism underlying quantitative results in at least partially new territory (p. 1157)	Two approaches: (1) supplementing qualitative work with quantitative data; (2) supplements quantitative tests with qualitative data.
Greene, Caracelli, & Graham (1989)	"Include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words)" (p.256)	Five purposes: (1) triangulation (seeking convergence of results), (2) complementarity (overlapping and different facets of a phenomenon); (3) initiation (discovering paradoxes, contradictions, fresh perspectives), (4) development (results from first method inform the use of the second method (5) expansion (adding breadth and scope to a project) (p.258-260).	Compared designs as to (1) how different was each method used, (2) whether same or different phenomena were examined with each method, (3) how different was each paradigm employed, (4) the status of each method (equal vs. unequal, (5) whether the implementation was independent or interactive, and (6) whether the timing was sequential vs. simultaneous.
Johnson, Onwuegbuzie, & Turner (2007)	"The type of research in which a researcher… combines elements qualitative and quantitative research approaches (e.g., the use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques)" (p.123)	Methodological pluralism, which frequently results in superior research compared with that of monomethod designs	Three approaches: pure mixed, qualitative dominant and quantitative dominant.
Molina-Azorin (2012)	"Combines qualitative and quantitative data collection and analysis in a single study" (2012:33)	(1) Triangulation (convergence and corroboration), (2) development (using the results from one method to help develop or inform the other method), (3) expansion (using different methods to assess different facets of a phenomenon, (4) complementarity (clarifying, enhancing or illustrating the results from one method with the results from the other method) (2012: 35, based on Green et al. 1989).	Four approaches: (1) equal priority simultaneous, (2) equal priority sequential, (3) different priority simultaneous and (4) different priority sequential; these are created from a 2-by-2 crossing priority of quantitative vs. qualitative (equal or different) and implementation (simultaneous vs. sequential) (cf. Johnson & Onwuegbuzie, 2004).

Table 1. Definition, Purpose and Approaches For Mixed Methods Research in Prior Literature (continued)

Authors	Core of Definition Of Mixed Methods	Purpose of Mixed Methods	Approaches to Mixed Methods
Tashakkori & Teddlie (1998; 2003, 2010)	"Qualitative and quantitative approaches are used in types of questions, research methods, data collection and analysis procedures, and/or inferences" (2003: 711)	Five purposes: (1) triangulation (seeking convergence of results), (2) complementarity (overlapping and different facets of a phenomenon; (3) initiation (discovering paradoxes, contradictions, fresh perspectives, (4) development (results from first method inform the use of the second method (5) expansion (adding breadth and scope to a project) (1998:43, cf Greene et al. 1989).	Three major approaches: (1) concurrent, (2) sequential, (2) conversion (quan data are converted into narratives or when qual data are converted into numbers).
Teddlie and Tashakkori (2009)	"Qualitative and quantitative approaches are used in types of questions, research methods, data collection and analysis procedures and/or inferences" (2009: 16).	(1) Can answer research questions that other methods cannot (for example, allows the researcher to simultaneously generate and verify theory in the same study), and (2) allows stronger inferences, (3) provides the opportunity for a greater assortment of divergent views.	Five approaches: (1) parallel , (2) sequential, (3) conversion (quan data are converted into narratives or when qual data are converted into numbers), (4) multilevel (qual data collected at one level of analysis and quan data are collected at another), and (5) fully integrated (mixing of qual and quan approaches occurs in an interactive manner at all stages of the study.

Table 2 Comparison of articles published in four journals with mixed methods single source and mixed methods multiple sources 2009-2014

Journal	Total articles 2009-2014	Mixed methods	% mixed	mixed/single	mixed/single %	mixed/multiple	mixed/multiple %
Academy of Management Journal	379	17	4%	7	2%	10	3%
Administrative Science Quarterly	112	15	13%	1	1%	14	13%
Journal of Applied Psychology	550	6	1%	4	1%	2	0.36%
Organization Science	498	31	6%	10	2%	21	4%
Total	1539	69	4.48%	22	1.43%	47	3.05%

Table 3: Practical Recommendations Emerging from Analysis

Phase	Recommendation	Description of Implementation	Example	How Extends Prior Reviews
Research Design	Select specific approaches to mixed methods in mature research domains, to enhance construct and model elaboration.	Even fairly well documented and mature domains of organizational research can benefit from a mixed-method approach that is finely tuned to elaborate on shortcomings in prior construct development or relationships included in models.	Bezrukova et al.'s (2012) elaboration as to the specific aspects of context that are important for understanding the effects of team fault lines using a combination of qualitative content analysis followed by complex quantitative modelling	Edmondson & McManus (2007) indicate that mixed methods are well suited for research domains that are of "intermediate" stage of development; our analysis indicates that even mature domains benefit, if the specific approach to mixed methods suits the research objectives for elaboration.
Data Collection	Utilize iterative processes in which insights gained in one phase inform data collected in other phases to expand access and improve generalizability.	Important knowledge comes from unexpected sources during the process of conducting mixed method research and iterative, negotiation, and relationship-based techniques are essential for improving generalizability, and more generally, ensuring rigor and impact; using specific, concrete findings from one method to inform explorations that can be continued with a different method.	In the Barley et al (2012) study, instances recorded in the communication logs informed specific questions the researchers asked of those respondents during interviews, hence they deviated from a structured interview protocol to help solve the puzzles that arose.	Most handbooks describe research design as a pre-formulated process that occurs prior to commencing data collection(e.g, Tashakkori & Teddlie, 1998; 2003; 2010; Teddlie & Tashakkori, 2009), but mixed methods can also be successfully executed with an iterative and emergent approach, which ultimately enhances generalizability.
Data analysis	Expand analytical options through shifts in sequence and unit of analysis to obtain triangulation.	Decoupling the sequence of analysis from the sequence in which data was collected, shifting the unit of analysis, and revisiting the literature to help inform analysis can help in achieving triangulation because they each expand analytical options.	Barley et al. (2011: 893) collected data sequentially but note "teleporting back and forth among the qualitative data, the quantitative data, and emerging categories and relationships"; the analytic processes that characterized each phase were rarely confined to that phase; Gardner (2012) shifted unit of analysis to the team meeting to better understand inconsistencies in the data.	Cresswell (2003) referred to 'concurrent designs,' and Molina-Azorin (2012) described the rare (but possible) 'simultaneous' approach; both involve collecting quantitative and qualitative data at the same time; extending this interviewees mentioned using a particular sequence for collecting data but rather than being wedded to that, shifting back and forth between different types of data and analysis to achieve triangulation.
Interpretation and Dissemination	Include rationale and benefit of mixed methods to fortify interpretation during preparation and review process.	Strategic framing of findings to illustrate the depth of interpretation made possible by mixed methods, both within the article itself, but also during the submission and revision process; the key is to emphasize how the combination of methods lends itself to deeper, novel, or more useful interpretations.	Toegel et al. (2013) used in-depth personal interviewing techniques to illuminate the prevalence and importance of behaviors previously considered as superficial (e.g., listening and giving advice); being able to emphasize in the article itself that such insights were only possible due to mixed methods made a strong case for an article that utilizes such methods.	Creswell and Plano Clark (2011: 262) suggest including in the article itself the reasons that mixed method research is appropriate to address the research problem, but here this extended to address the strategic framing of findings to illuminate the depth of interpretation made possible by mixed methods in the article and during the publication process.