Article

The Practical Utility of Mixed Methods: An Empirical Study

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Abstract

While methodologists often assert that a mixed methods approach has greater practical utility than a monomethod approach used in a similar setting, empirical data have been lacking. To examine this assertion, we studied the practical utility of workplace assessments in 1801 public organizations in Denmark, of which 540 chose mixed methods. We measure utility in terms of action taken as well as perceived utility.

We contribute to mixed methods research by documenting higher practical utility in mixed methods. Mixed methods share with qualitative methods an association with influence from local stakeholders and employee engagement, but not the weaknesses of qualitative methods (such as lack of documentation and incompatibility with management preferences). Mixed methods may serve diverse stakeholders as a successful hybrid rather than as a unique paradigm.

Keywords

utility, use of mixed methods, mixed methods research a hybrid

Introduction: What Drives the Practical Utility of Mixed Methods?

As part of the knowledge society (Stehr, 1994), an increasing amount of research takes place in the practical, organizational, and political contexts of its use, the so-called "mode II" (Gibbons et al., 2010). The practical utility of research becomes an increasingly pressing issue. We apply the term utility to mean the influence, implications, or consequences of research findings (or of the research processes itself) (Forss et al., 2002; Schwandt, 2015). The term "practical" describes utility as contextual and situated and related to practical action. We argue that action taken as a result of a given study is a meaningful measure of its utility, especially when action is the declared purpose of the study. Another reasonable measure is the perceived utility of research among stakeholders centrally located in the practical situation at hand.

Mixed methods research (MMR) is participating actively in the mode II movement. With MMR being 2–3 times more prevalent in various forms of applied research as compared to pure research (Alise & Teddlie, 2010), it is involved in participatory research and democratic

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innovation (Escobar & Thompson, 2019), in client-oriented professions (e.g., nursing, education, social work, psychology, and public health) (Plano Clark & Ivankova, 2016) and in evaluation (Greene, 2007; Mertens & Tarsilla, 2016). Evaluation is a particularly illustrative example since the purpose of evaluation includes the intended use of findings for practical purposes (such as improvement, learning, and social betterment) (Mathison, 2007; Shadish et al., 1991).

Rationales for mixed methods research include deeper insight, triangulation, the enrichment of interpretations, and more validated knowledge (Creswell & Plano Clark, 2007; Flick et al., 2012; Molina-Azorin & Cameron, 2010; Schoonenboom & Johnson, 2017). The broad purposes of breadth, depth of understanding, triangulation, complementarity, and corroboration are seen as central (Greene, 2007; Johnson et al., 2007, p. 123, p. 45). MMR is said to "provide the most informative complete, balanced, and useful research results" (Johnson et al., 2007, p. 129). However, do these alleged special characteristics of knowledge produced in MMR in fact translate into practical utility?

Main developments in MMR have focused on design issues and knowledge-construction, while the practical utility of MMR remains an open empirical question (Schwandt & Lichty, 2016). Since Bryman (2008, p. 94) found a mismatch between the official rationale for mixed methods and how they are used in practice, the alleged strengths of MMR may or may not be good predictors of its strengths in real life. So *if* MMR has extraordinary practical utility under given circumstances, the next question is *why*. Are the underlying drivers of practical utility the specific knowledge produced by MMR or other aspects of MMR, such as how well MMR serves diverse needs among stakeholders?

Potential drivers of utility of MMR may be found in comparing mixed methods not only to monomethods but also to quantitative and qualitative methods, respectively. Mixed methods combine specific traits from quantitative and qualitative methods, which serves various stakeholders, ideally without inheriting any of the weaknesses of any single method.

We show how this is happening in a particular empirical field: Workplace assessments in public agencies in Denmark. Workplace assessments are evaluations of the physical and psychosocial work environment intended to support action and improvements. We study 1801 such agencies, of which 540 (or 30%) chose mixed methods, which is defined as the combination of at least one quantitative and at least one qualitative method in the same workplace assessment. This operational definition is consistent with common sense and with common definitions of MMR (Johnson & Onwuegbuzie, 2004, p. 17).

We operationalized the practical utility of workplace assessments as the extent to which these assessments lead to concrete actions intended to improve the working environment, which is their key purpose. We also assessed the perceived utility of workplace assessments in the eyes of key stakeholders called occupational safety and health representatives, for whom the workplace assessment is *the* most important instrument (LO, 2018).

Our research questions are as follows:

RQ1. Are workplace assessments with mixed methods characterized by a higher practical utility?

RQ2. Are workplace assessments with mixed methods producing knowledge with particular characteristics (such as reliable knowledge, new knowledge or knowledge fit for documentation purposes)?

RQ3. Are workplace assessments with mixed methods particularly associated with organizational variables (such as a balanced influence of various stakeholders, employee engagement or organizational conflict)?

In answering these questions, we do not assume paradigmatic uniqueness or superior knowledge production in mixed methods, nor do we build assumptions about ideal integration of multiple methods into our definition since it would be unfair to test the utility of *ideal* mixed methods against that of *actual* monomethods. Following Bryman (2008), we did not ask

practitioners about their normative justifications for MMR. We simply asked the occupational safety and health representatives which methods were used to collect data in their most recent workplace assessment. We asked them about the characteristics of the knowledge gained and organizational variables describing the context in which it took place. Finally, we asked them whether action was taken as a result of the workplace assessment and how they assess the utility of this type of assessment. Analytically, we then build a plausible pattern of explanations of the practical utility of mixed methods by looking at their correlations with the variables related to knowledge and organization.

This strategy allows us to contribute to the literature on MMR by demonstrating the practical utility of MMR empirically. We contribute to a research agenda that builds an empirical foundation for rationales for MMR. This is an important agenda for the credibility of MMR over time. Rather than just relying on normative and prescriptive statements about MMR of which the literature is rich already (Plano Clark & Ivankova, 2016), we document the practical utility of MMR and identify its potential sources. We believe our study is the first to back up this endeavor with a study of as much as 1801 cases.

More specifically, we test seven propositions about strengths (or weaknesses) of MMR. The first one predicts practical utility. The remaining six propositions help us systematically scan our data for associations between mixed methods and credible sources of potential utility. Three of these propositions include characteristics of the knowledge produced (the keywords being novelty, reliability, and documentation), and three mention organizational variables (stakeholder influence, engagement, and conflict).

By comparing mixed methods to quantitative and qualitative methods, respectively, in all these aspects, we can identify, point by point, what might be the underlying sources of the practical utility of mixed methods. We *determine* whether associations stipulated in our propositions actually exist empirically in our material. The causal interpretation of these associations is something we *discuss* but do not demonstrate. We only offer a plausible story about the sources of the practical utility of mixed methods based, guided by our propositions and supported by a large empirical material.

In the following sections, we consider situatedness and utility of MMR. We then describe the context in which workplace assessments take place in Denmark. Based on theory and the description of the role of these assessments, we explain and justify our seven propositions about the potential strengths of mixed methods. Next, our study is accounted for (itself a mixed methods study). Our findings are then presented, followed by a discussion, and finally, a conclusion.

The Situatedness of Mixed Methods Research

Knowledge is produced under social, organizational, and practical circumstances (Camic et al., 2011). Studies of the social life of methods (Savage, 2013) have tied the understanding of methods to their social history, circulation, and use (Timans et al., 2019). Methods hinge on "hinterlands" consisting of management capacities, infrastructures, funding bodies, political and economic agendas, and so forth (Law, 2004, p. 40).

Mixed methods research is conditioned by institutional, disciplinary, and social contexts (Plano Clark & Ivankova, 2016). MMR advocates argue for a grounded, pragmatic approach to understanding what researchers actually do (Torrance, 2018, p. 782). While the link between philosophical convictions and methods is loosened, even if this move is subject to much debate (Denzin & Lincoln, 2018, p. 314; Wouters, 2017), a common belief is that research methods or a package of them should be chosen with respect for situational and contextual specificities.

Sandelowski et al. (2012) and Plano Clark and Ivankova (2016) argue that strengths and weaknesses are not inherent in methods themselves, but in their ability to produce answers to

specific research questions. Benefits such as learning can also flow from participation in data collection and not only from results and findings; a phenomenon called "process use" (Forss et al., 2002). Successful learning processes may include positive feedback loops between participation in data production, a sense of ownership, perceived relevance, engagement, and subsequent use (Cousins, 2003; Nielsen & Randall, 2013).

In addition to effects upon the type of knowledge produced, mixed methods may have advantages for the involved stakeholders, such as the incorporation of diverse views and higher acceptability of results, including "political validity" (Onwuegbuzie & Johnson, 2006, p. 57). It is therefore reasonable to understand mixed methods in the context of the influence and engagement of various groups of stakeholders and in the context of overall patterns of cooperation and conflict.

The legitimacy of a method among a set of stakeholders can be taken into account when choosing methods (Patton, 2011). The aspects of mixed methods relating to knowledge and to social relations may of course interact in practice (Oakley, 2000). For example, when knowledge is produced and used in an organizational setting, it may count as official "documentation" only when certain institutional rules defining the forms of knowledge and formats for presentation are met (Morgan, 1986). Documentation refers to the ability of knowledge to travel through time and space and its ability to officially convince others. For example, systematic and standardized measurements are used by managers in large-scale organizations in a manner similar to "seeing like a state" (Scott, 1999) and using "statistics" (Desrosiéres, 2002).

At the same time, in processes of organizational learning and change, employee participation and engagement are needed (Nielsen & Randall, 2013). Mixed methods researchers may be particularly likely to reflect such multiple or even contradictory concerns in their work (Mertens & Tarsilla, 2016).

By implication, when understanding the situatedness of MMR, it is reasonable to take into account both its effects on the type of knowledge produced and the concerns and interests of the involved stakeholders in the organizational situation at hand. Given that MMR is practically situated, how can one assess its practical utility?

The Practical Utility of Mixed Methods Research

A literature consisting of systematic empirical studies of mixed methods is beginning to emerge (Plano Clark & Ivankova, 2016), but more is known about the prevalence of MMR (Alise & Teddlie, 2010; Plano Clark, 2010) and about frameworks for appraisal of MMR (Heyvaert et al., 2013) than about its actual utility. McKim (2017) found that students perceive mixed methods research to be relatively more credible. Molina-Azorín (2011) showed that studies based on mixed methods published in management journals received more citations than monomethod studies and that the themes addressed by mixed methods studies may help explain their impact. Nevertheless, it is difficult to find systematic large studies of the practical utility of MMR.

A part of the literature suggests that MMR may be motivated by philosophical pragmatism (Feilzer, 2010; Johnson et al., 2007; Tashakkori & Teddlie, 2003), but the combination of multiple methods in a given study can be driven by many purposes and does not require any philosophical commitment (Schwandt & Lichty, 2016).

In that light, utility of knowledge conceptually includes many dimensions and must take into account the interests of different stakeholders, and different time frames. While there may be many forms of use of knowledge in principle, including instrumental (direct and purposeful) use, process use, enlightenment, strategic use, tactical use, symbolic use, and more (Vedung, 1997), it is not possible to measure general utility of MMR in a comprehensive and exhaustive way. Our position here is a logical consequence of the situated view of mixed methods, according to which mixed methods responds to different questions and different purposes in different contexts.

In practice, however, it is often meaningful to focus on *primary use for primary users* in a given situation (Patton, 1986). What is primary depends on an interpretation of the situation. In our case, we find it meaningful to apply the official purpose of an evaluation as a yardstick in assessment of the utility of the evaluation. So, when the purpose of an evaluation is institutionally defined as mapping and ameliorating risks factors in a given area of life, then a good part of its practical utility ("primary use") hinges meaningfully on whether it actually supports *action* aimed at the reduction of these risks. Operationally, key users can report whether action took place and whether they found the evaluation useful. As central and meaningful (albeit not exhaustive) aspects of practical utility, we shall therefore focus on *actionable findings and perceived usefulness in the eyes of key actors*, whose role it is to further the purpose of the evaluation at hand. We do this out of respect of the users of MMR and of the complicated organizational realities that they must take into account in practice (Mertens & Tarsilla, 2016). We now focus on workplace assessments as a context for such a practice.

Workplace Assessments in the Danish Public Sector

An optimal context for a study of the practical utility of MMR is one where

(a) a large number of practitioners are required to carry out a form of systematic data collection under comparable institutional circumstances (such as a mandatory evaluation with the same overall purpose) so that fair comparisons can be made across cases.
(b) practitioners within each organization are free to choose MMR designs or monomethods so that variation across cases can be studied.
(c) data can be collected about characteristics of the knowledge produced as well as organizational variables, which may interact with methods and the use of results.
(d) meaningful indicators of the practical utility of these studies can be found, for example, with a starting point in the official purpose of the studies at hand and in the identification of practitioners with an institutionalized role that makes them responsible for knowing about the use of these studies.

All these criteria are met in workplace assessments in Denmark. EU Framework Directive 89/391 places the responsibility for assessments of workplace safety and health risks on the employer. Consequently, Danish legislation prescribes that all workplaces must carry out an assessment of such risks to workplace safety and health at least every 3 years. The purpose is to evaluate the existing work environment and pave the way for ongoing amelioration of physical and psychosocial risk factors. The workplace assessment must exist in a documented form, include an action plan, and be available to employees. At the same time, however, it is up to each workplace to decide which risks to focus on, how to design the assessment, and whether or not to use it systematically (Robson et al., 2007).

We study workplace assessments in the public sector because public sector employees suffer from stress and other psychosocial problems to a larger extent than do private sector employees (The National Research Center for the Working Environment, 2018). In workplaces with ten employees or more (which is the case for the vast majority of public sector workplaces), occupational safety and health representatives are elected among the personnel. In their work together with managers to monitor and improve the working environment (Dahler-Larsen & Sundby, 2019), the occupational safety and health representatives regard the workplace assessment as their single most important instrument (LO, 2018). We therefore used these representatives as informants.

When we asked them about whether their workplace assessments resulted in concrete actions and action plans, we tied our understanding of practical utility to the official purposes of the workplace assessments. We also asked the safety and health representatives about their overall assessment of the utility of workplace assessments. In sum, we captured key aspects of practical utility.

Propositions

Table 1 shows our seven propositions, their justification, and the definitions of the key concepts in each of them.

In proposition 1, we project that mixed methods are associated with higher practical utility (as a corollary of RQ1).

The remaining propositions all suggest potential pathways between method choices and utility. To cover RQ2, propositions 2–4 focus on aspects of knowledge. As suggested earlier, if mixed methods produce particular insights, there is reason to believe that the choice of mixed methods is associated with the production of new knowledge (Greene, 2007). If mixed methods provided corroboration of evidence, it may also produce more reliable knowledge (Johnson et al., 2007; Schoonenboom & Johnson, 2017). If mixed methods produce more reliable findings, deeper insight, triangulation, the enrichment of interpretations, and more validated knowledge (Creswell & Plano Clark, 2007; Flick et al., 2012; Molina-Azorín & Cameron, 2010; Schoonenboom & Johnson, 2017), we hypothesize that they might also serve documentation purposes better than monomethods.

In response to RQ3, we present propositions 5–7 which talk about how methods used in workplace assessments may reflect the influence of various stakeholders (Kroll, 2015), the engagement of employees in the process (Nielsen & Randall, 2013), and the level of organizational conflict (Ledermann, 2012), which may influence dialogue and collaborative use (Moynihan, 2008).

Each proposition predicts an empirical association, but not a unidirectional causal link. For example, in relation to proposition 6, mixed methods may breed engagement, but engaged employees may also help choose mixed methods in the first place. Either way, an empirical association of engagement and mixed methods may indicate that a road to the practical utility of MMR goes through the engagement of employees.

All of the propositions 2–7 are reasonably grounded theoretically and empirically as predictors of influence on use of information in organizations (Kroll, 2015), and on workplace assessments specifically (Dahler-Larsen & Sundby, 2019). Once we show that mixed methods are in fact associated with higher utility (proposition 1), we can therefore use propositions 2–7 to build a patchwork of explanations as to *why* this might be.

As a step toward theorizing about the utility of mixed methods, we will pay particular analytic attention to the scores of mixed methods *as compared to quantitative and qualitative methods, respectively*. A consistent pattern distinctly different from any monomethod on all seven accounts can be expected if there is a philosophical uniqueness to MMR as a paradigm. Alternatively, mixed methods are better described as a compromise or a hybrid if there are shifting strengths (and weaknesses) shared with either quantitative or qualitative methods in each of the seven aspects.

Methods

The study is part of a larger project intended to map the production and use of workplace assessments and to identify predictors of variations in their use in public organizations in Denmark. The in-depth study of methods in workplace assessments presented here fits logically into the larger purpose of the study.

Table 1. Seven Propositions.

Proposition	Justification	Key definitions
1. *Mixed methods in WPAs is associated with higher levels of use*	Mixed methods produce a particular kind of knowledge and serve organizational stakeholders well which lead to higher practical utility.	Use: Operationally defined as the degree to which the OSHR reports that the WPA led to action against physical and/or psychosocial risks and/or to action plans. The OSHR's assessment of the utility of the WPA.
2. *Mixed methods in WPAs is associated with new knowledge*	The combination of methods produces new insights.	New knowledge: The degree to which the OSHR reports that the WPA has produced knowledge hitherto unknown in the organization.
3. *Mixed methods in WPAs is associated with knowledge that is perceived to be more reliable*	Mixed methods solidify findings through triangulation. Mixed methods allow people to be heard in different ways. They will find the results consistent with their view of reality.	Reliable knowledge: The degree to which OSHR reports that the WPA provides a trustworthy picture of the real work environment.
4. *Mixed methods in WPAs is associated with knowledge fit for documentation purposes*	A wider set of data sources leads to more robust documentation.	Documentation: The degree to which the OSHR reports that the WPA documents on paper something which is already only informally known in the organization.
5. *Mixed methods in WPAs is associated with a balanced influence of different stakeholder groups*	The combination of methods serves different needs among managers and employees. In situations where the influence of these groups is balanced, mixed methods is a logical choice.	Influence: The degree to which the OSHR attributes influence to the "upper organization" (such as upper managers and HR departments) and the "local partners" (OSHRs, their colleagues and immediate bosses), respectively.
6. *Mixed methods in WPAs is associated with higher engagement among employees*	Employees are the key providers of data into WPAs. Mixed methods allow for expression of different views in different ways. Therefore, employees will be more engaged.	Engagement: The degree to which OSHR describes employees as engaged in the WPA process.
7. *Mixed methods in WPAs is associated with a moderate level of organizational conflict*	Mixed methods may allow for expression of different views and thus reduce conflict. However, if there is conflict to begin with, it may stand in the way of joint commitment to a design, where different voices are heard.	Conflict: The degree to which the OSHR experiences conflicting views about the working environment at the workplace.

While our research process was contingent, emergent, and reflexive as described in the literature (Creswell, 2011, p. 279; Escobar & Thompson, 2019, p. 506; Mertens & Tarsilla, 2016; Plano Clark & Ivankova, 2016, p. 277; Sanscartier, 2020; Schoonenboom & Johnson, 2017; Timans et al., 2019), the key components in our research design are schematically shown in Figure 1.

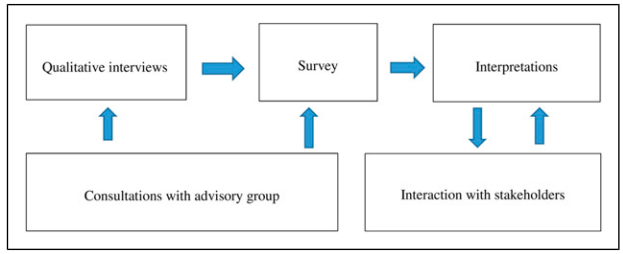

Figure 1. Design of the study.

The project was designed as a sequential mixed method study (Creswell & Plano Clark, 2007) with a dominant quantitative component, a survey (Johnson et al., 2007, p. 124). However, the design of the survey and the interpretation of its findings were highly dependent on qualitative inputs.

To understand basic dimensions of the work with workplace assessments and to make the subsequent survey questions as relevant as possible, we conducted qualitative studies with 15 key informants and occupational safety and health representatives. This number is within Brinkmann and Kvale's (2015) suggested range of 5–25 informants (depending on purpose) and within recommendations of 15–60 participants in interview studies (Saunders & Townsend, 2016). Consultations with our advisory board, which included a ministry official, a public sector HR manager, a work environment specialist, and trade union representatives also helped us understand the terminology and real-world challenges in work with workplace assessments, which was the objective for the qualitative component in our study. In particular, we used the qualitative interviews to make sure that we understood all dimensions of the practical utility of workplace assessments as seen from the perspective of the occupational safety and health representatives so that we could measure and interpret situated utility properly.

We conducted a large survey among these respondents after several rounds of pilot studies. We calibrated the formulation of items based on the knowledge gained in the interviews.

Given a lack of an official list, we contacted the respondents through twenty trade unions. The participating occupational safety and health representatives worked on the state, regional, and municipal levels in the public sector and in a broad variety of branches. A safety and health representative in one union is often elected to represent all of the employees in a workplace regardless of their function, educational background and trade union affiliation. The viewpoints of the safety and health representatives evidently do not represent all stakeholders in the organization, but they are central players in the workplace assessment process.

Data were collected in late 2018 and early 2019. We received responses from 2221 occupational safety and health representatives (32.8% response rate). Among these, 2047 report on their methods used in their most recent workplace assessment. We are not overly concerned with a potential non-response bias here since newly appointed occupational safety and health representatives may lack knowledge about the more recent assessment which could have taken place up to 3 years ago.

246 respondents reported using "other" methods, which excluded them from our systematic typology of method choices. When methods are mixed, we want to know exactly what is mixed. We therefore base our analysis on the remaining 1801 cases with a crystal-clear description of well-described method choices relevant for our study (see Table 2).

Since many workplace assessments are based on multiple methods, the exclusion of the category "other" influences the frequency of all categories of methods, but not in a way that distorts the overall distribution. The remaining 1801 cases were categorized into quantitative methods only, qualitative methods only, and mixed methods. To check whether the transition to

Table 2. Methods Used in the WPAs.

	All WPAs (*N* = 2047)	WPAs not using "other" methods (*N* = 1801)			
	All	Quant only	Qual only	Mixed methods	All
Survey	1729	1112	0	494	1606
Statistics	389	117	0	221	338
Single-person interview	256	0	60	172	232
Group interview	236	0	67	150	217
Summary from workshops	479	0	64	361	425
Other	246	0	0	0	0
Total	2047	1120	141	540	1801
% of WPAs in the study defined as quant, qual or mixed		62.2%	7.8%	30.0%	100%

1801 cases distorted the analysis, we were able to reproduce the same findings reported in Table 4 based on the 2047 cases (analysis not reported). We prefer the solution with 1801 cases because of its clarity. The 1801 occupational safety and health representatives represent 89,618 employees.

The feedback we received, first from our advisory board, then from stakeholders such as a ministry, an inspection agency, a university, and several trade unions, helped us interpret our findings. In our interpretations of the survey findings, we remain exploratory. For example, instead of just comparing mixed methods to monomethods, we compare mixed methods to both quantitative and qualitative methods in our search for nuanced explanations of the practical utility of mixed methods.

Operationalizations and Variables

All of the following variables are based on survey data with occupational safety and health representatives as respondents.

Methods

We asked our respondents to describe the methods used to collect data in the workplace assessments in terms of the following categories: Surveys, single interviews, group interviews, meetings/workshops, statistics, and other. Our "quantitative methods" comprise surveys and/or statistics. Qualitative methods are one or several of the following: interviews, focus groups, and meetings/workshops.

When we refer to, for example, quantitative methods in the following, we mean only quantitative methods. Similarly, when referring to qualitative methods, we mean only qualitative methods. We therefore refer to these categories as "monomethods." In contradistinction, we define mixed methods as the combination of at least one of the quantitative methods and at least one of the qualitative methods. This definition is operationally defined based on our empirical data, and remains consistent with common sense and with definitions in the literature (Escobar & Thompson, 2019; Johnson et al., 2007; Tashakkori & Creswell, 2007, p. 4, p. 120).

Driven by the theoretical ambition to find out whether mixed methods share particular traits with either quantitative or qualitative methods for each of the seven propositions, we represent these three method choices as three separate rows in our tables. With mixed methods as a reference, we test the significance of the differences in scores between organizations using mixed

methods versus those using quantitative methods (reported in the "quantitative row") as well as the significance of differences in scores between organizations using mixed methods and qualitative methods (reported in the "qualitative row"). This allows us to see if organizations using the monomethods systematically differ from those using mixed methods or whether there is a more complex set of similarities and differences between mixed methods and any of the monomethods, which would indicate that mixed methods operates like a hybrid.

Consistent with the terminology in our seven propositions we show empirical *associations* in our relatively simple tables. Especially when it comes to the interaction between organizational variables, methods, and utility, we shall discuss the causal interpretations of these associations with care.

We operationalized our variables in the following way.

Practical utility

We measured the practical utility of workplace assessments in terms of the extent to which occupational safety and health representatives report that the assessment has resulted in action taken to ameliorate risk factors in the physical and psychosocial domains, respectively. We also determined the degree to which the respondent is aware of an action plan to follow up on the assessment. This can be a useful indicator of subsequent action, too, since an action plan officially commits an organization to future action. All of this resonates with the official purposes of workplace assessments. We also asked the occupational safety and health representatives to assess the general utility of workplace assessments from their own perspective.

Aspects of the Knowledge Produced

New knowledge: We asked about whether the workplace assessment was seen to produce new knowledge hitherto unknown in the organization.

Reliable knowledge: We asked about the degree to which the workplace assessment was perceived to produce a reliable picture of the real problems in the work environment.

Documentation: We asked about the degree to which the workplace assessment documents on paper something which was otherwise only informally known in the organization.

Organizational Variables

We measured the influence of various stakeholders in the organization on the workplace assessment as a process, including the design, in terms of two indexes. "Influence of the overall organization" is based on how the respondents assess the influence of upper management, the HR department, and the working environment committee since they were found to be correlated in a factor analysis (Dahler-Larsen and Sundby, 2019). "Local influence" is another index based on how the occupational safety and health representatives assessed the influence of themselves, their immediate colleagues, and their immediate superior (also correlated in a factor analysis).

The level of engagement of employees in the workplace assessment was also assessed by the respondents. Finally, the level of conflict related to the work environment was measured in terms of how often the occupational safety and health representatives encounter contradictory views about the work environment in the organization.

All variables, except methods choices, were transformed into scales from 0 to 100 (for action plans: percentages) to facilitate easy comparison.

Findings

Dilemmas in Workplace Assessments. In the qualitative interviews, the informants told us about a general dilemma in the work with workplace assessments. Management support (and influence) is required to ensure a systematic approach and follow-up. However, if the design of the workplace assessment is determined from the top, the result is often a standardized survey with items that are perceived as less relevant in the local context (Dahler-Larsen & Sundby, 2019, p. 71). The occupational safety and health representatives saw a need for an open, exploratory approach to include the most pressing problems at the local level. One dilemma here is that the sensitivity of psychosocial issues creates a need for anonymity which is better served by a survey than by a qualitative, participatory, dialogue-based form of data collection with face-to-face contact.

In practice, these tensions are dealt with in cooperation between managers at different levels and occupational safety and health representatives in the context of dynamic organizational life.

The qualitative interviews also provided a nuanced understanding of several aspects of the utility of workplace assessments. First of all, occupational safety and health representatives are of course interested in making sure that the findings are transformed into action. This is sometimes easy with pedestrian changes in the physical environment for specific employees at specific locations (such as light, temperature and equipment). In the psychosocial domain, however, and with anonymous data, more general and systematic approaches are needed. Action plans are useful to coordinate larger, long-term systematic efforts. However, we learned not to assume that the action plan exists as legally required, but to check whether the occupational safety and health representative actually *knows* it exists. However, the full utility (as seen from the perspective of the informants) of the workplace assessment is not exhausted by reference to actions and action plans. They also find that an important function of the workplace assessment is to "keep safety and health on the agenda" and to "remind everybody" about the importance of the working environment. The interviews provided a nuanced understanding of these dimensions of practical utility of workplace assessments.

We now turn to our quantitative findings.

Descriptive Statistics. As Table 3 shows, about 79% of the workplace assessments lead to action plans. Perceived usefulness is at 65 on a 0–100 scale, which is higher than two actual forms of action taken in the physical and psychosocial domain, respectively. What interests us in particular, however, is of course how these measures of utility vary with methodological choices (see Table 4).

Practical Utility

Table 4 shows four aspects of practical utility. Workplace assessments with mixed methods have high scores on all of them, whether it is action taken in the physical or psychosocial domain, awareness of action plans, or the occupational safety and health representative´s assessment of the usefulness of workplace assessments. Mixed methods have significantly higher scores than quantitative methods on all these accounts. Compared to qualitative methods, mixed methods have higher scores with respect to action in the psychosocial domain and with respect to action plans. The fact that mixed methods score higher than any monomethod on all dimensions of practical utility indicates robustness in our findings.

We therefore ask whether mixed methods may be characterized by special properties of the knowledge produced which could help explain the practical utility of mixed methods.

Aspects of the Knowledge Produced in Workplace Assessments

All methods have relatively low scores with respect to the production of new knowledge. There is practically no difference between the methods in this respect (Table 5).

Table 3. Descriptive Statistics (N = 1801).

	Survey item(s)	Mean or % yes	N
New knowledge	Did the WPA lead to new knowledge not already existing at the workplace*	37.86	1645
Reliable picture	The WPA gives a reliable picture of the work environment*	61.61	1596
Documentation	Did the WPA lead to the documentation of problems already known to exist?*	58.20	1604
Upper organizational influence	How much influence did the following stakeholders have on the WPA design? An index constructed of: - upper management* - the HR department* - work environment organization*	62.08	992
Local influence	How much influence did the following stakeholders have on the WPA design? An index* constructed of: - my colleagues - my immediate boss - myself as an OSHR	51.92	1308
Employee engagement	The employees show engagement in the WPA (5-point scale)*	60.61	1612
Conflict recode	I encounter contradictory views about the work environment at my workplace*	52.85	1640
Use: Physical domain	Did the WPA lead to concrete initiatives aimed at improving the physical work environment?*	54.64	1599
Use: Psychosocial domain	Did the WPA lead to concrete initiatives aimed at improving the physical work environment?*	49.15	1551
Action plan awareness	Did the WPA lead to an action plan? (don't know counted as no)	79.31	1692
Perceived usefulness	Is the WPA generally a useful instrument?*	65.28	1608

*5-point scale(s) (e.g., strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree) recalibrated into a 0-100 range for comparison purposes.

Table 4. Aspects of Utility of WPAs Broken Down by Methodological Choice.

	Action in the physical domain	Action in the psychosocial domain	Awareness of action plan	Perceived utility
Mixed methods	59.2	53.8	86.2	69.7
Quantitative methods only	52.1***	47.0***	76.2***	63.1***
Qualitative methods only	56.8	48.3*	77.2*	65.7

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$ (independent samples two-sided T-test using mixed methods as reference group).

However, there is a significantly higher degree of perceived reliability for mixed methods as compared to quantitative methods. In comparison to qualitative methods, mixed methods have higher scores with regard to the production of knowledge used for documentation purposes. In other words, mixed methods have perceived reliability in common with qualitative methods, and documentation power in common with quantitative methods.

Finally, let us see how methods are associated with organizational variables.

Table 5. Aspects of Knowledge Produced in WPAs Broken Down by Methodological Choice.

	New knowledge	Reliable picture	Documentation
Mixed methods	37.8	64.1	58.7
Quantitative methods only	37.8	60.2***	58.9
Qualitative methods only	38.4	63.7	50.2***

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$ (independent samples two-sided T-test using mixed methods as reference group).

Table 6. Organizational Variables Broken Down by Methodological Choice.

	Upper organizational influence	Local influence	Employee engagement	Conflict
Mixed methods	63.3	63.9	64.0	50.6
Quantitative methods only	63.1	41.6***	58.5***	54.7**
Qualitative methods only	50.5***	73.5***	64.6	46.7**

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$ (independent samples two-sided T-test using mixed methods as reference group).

Organizational Variables

Mixed methods are associated with a higher level of upper organizational influence (upper managers and the HR department) than are qualitative methods. In turn, qualitative methods come together with a significantly higher level of influence of local partners (the safety and health representative, colleagues, and immediate manager) than mixed methods. In turn, quantitative methods are significantly associated with a particularly low level of influence of these stakeholders and a low level of employee engagement (Table 6).

Finally, quantitative methods are associated with a relatively high level of organizational conflict, and qualitative methods with a low level, while mixed methods can be found in the middle with significant distance to both of them.

Put differently, mixed methods are akin to quantitative methods with respect to the influence of upper management. Mixed methods resemble qualitative methods with respect to employee engagement. When it comes to the influence of local stakeholders and organizational conflict, the monomethods have entirely different scores at either end of our continuum, and mixed methods are placed between them.

Discussion

The Utility of Mixed Methods

Consistent with proposition 1, mixed methods have high scores on an all four aspects of use: Action taken in the physical or psychosocial domain, awareness of action plans, and the occupational safety and health representatives' assessment of the usefulness of workplace assessments. Mixed methods have significantly higher scores than quantitative methods on all four accounts. Our best explanation here is that monomethod quantitative surveys may be chosen as a default option in organizations where there is little interest in doing anything more than what is legally required and where there is no desire to open a dialogue about safety and health. This interpretation is consistent with what the safety and health representatives told us in interviews.

Mixed methods have higher scores than qualitative methods only with respect to action in the psychosocial domain and with respect to action plans. It might be that qualitative methods lack the anonymity needed to collect data in the psychosocial domain. Furthermore, qualitative data might be more locally used and not systematically incorporated into organizational action plans. We do not *know* this, but it is consistent with the idea that quantitative rather than qualitative data are typically used in general managerial information systems.

Still, even in aspects of utility where qualitative methods do not significantly differ from mixed methods, the latter still has the higher score. This suggests that the utility of mixed methods is second to none, regardless of which aspect of practical utility we are looking at. It also suggests robustness in our findings: Mixed methods do have utility. Next, what might be the underlying drivers? For example, do mixed methods produce a special kind of knowledge?

Factors Related to Knowledge

Proposition 2 predicted that mixed methods are associated with new knowledge. This was not found to be the case. Mixed methods do not have any particular advantage in this respect. Neither do any of the monomethods. In the interpretation of these findings, keep in mind that all aspects of knowledge, including its novelty, are based on the assessment made by the occupational safety and health representatives. These representatives have daily contact with the work environment, so it may be difficult for any method to deliver knowledge that they assess as genuinely new.

Mixed methods are positively correlated with reliable knowledge (proposition 4), but only in comparison to quantitative methods. A clue to an explanation rests with surveys (the dominant quantitative method) which allegedly suffer from low response rates, responses made haphazardly, and standardized items perceived to be less relevant for the local situation at hand (Dahler-Larsen & Sundby, 2019). So, when it comes to perceived reliability of workplace assessments, those with mixed methods are akin to those using qualitative methods.

The case is the opposite with respect to documentation power. There is a lack of ability in qualitative methods to provide data that serve as documentation. This is unsurprising. The belief in numbers as sources of solid documentation is deeply rooted in Western culture (Porter, 1995). Quantification also allows for comparison and for oversight in terms of averages and summaries. Documentation purposes seem to be served equally well by quantitative monomethods and by mixed methods. The critical and significant point is to *not* choose qualitative monomethods.

To sum up, in our findings, mixed methods do not deliver new knowledge, but they deliver reliable knowledge at least as well as qualitative methods do and documentation at least as well as the quantitative ones.

There is some, but not overwhelming support for the three propositions mentioning aspects of the knowledge produced in MMR. Mixed methods do not *generally* score higher than monomethods, but for two of the propositions, mixed methods *share* high scores with *one* of the monomethods at a time. However, mixed methods have a particularly low score in none of these aspects. It seems that mixed methods share some strengths with some monomethods but no particular weaknesses.

Organizational Factors

Mixed methods are not particularly associated with the influence of stakeholders placed in the upper layers of the organizational hierarchy, but the influence of these stakeholders is strongly negatively associated with qualitative methods. Our interpretation is that when upper managers are involved, they do not prefer qualitative methods as monomethods. This is logical if upper management wants documentation, comparisons, oversight, etc. But the influence of the upper

organization is the same for mixed and quantitative methods, which suggests that upper management accepts a qualitative component in a package which includes quantitative methods.

The influence of local stakeholders is strongly associated with methods. Qualitative methods have high scores in this regard, quantitative methods low scores, and mixed methods in between, but closer to the top than to the bottom. These findings are consistent with proposition 5, which talks about a balanced influence of the different stakeholders. The specific combination consistent with our data is that upper managers opt of qualitative methods as monomethods and local stakeholders prefer qualitative methods. So, under these cross-pressures, mixed methods seem to be an acceptable choice for all. It is also possible that local units in the organization simply add their own qualitative components in addition to quantitative designs chosen at the top. If different stakeholders use different methods in parallel in the same workplace assessment, it is still consistent with proposition 5. It is possible that different methods allow different stakeholders to use the components in a mixed assessment for separate purposes. Typically, it could be quantitative methods for management oversight and documentation purposes, while qualitative methods may facilitate local agenda-setting and development.

Mixed methods score better on employee engagement (proposition 6) than do quantitative methods. Again, the association may work in several ways. More engaged employees may exert influence on the choice of methods. Engaged employees presumably provide a fertile ground for the more demanding dialogue-oriented qualitative methods or mixed methods in contrast to surveys, which do not require much time and effort, particularly from non-responders. The similar scores on engagement for mixed methods and qualitative methods suggest that what might motivate employees is the opportunity to participate in defining problems and bringing up their concerns in their own words in non-standardized ways.

All other things being equal, mixed methods take more time and require more effort (Johnson et al., 2007; Molina-Azorín, 2011). If mixed methods are a proxy for general effort, it is hardly surprising that organizations that spend more energy on workplace assessments are also likely to use them more. In these ways, MMR and its practical utility both depend on and contribute to larger patterns of cooperation and engagement.

Finally, mixed methods are not associated with particular high or low levels of organizational conflict (proposition 7). But quantitative methods are characteristic of organizations with high levels of conflict, and qualitative methods with low conflict. Why is that? In conflict-laden situations, it may be tempting to choose surveys and statistics that do not require dialogue and in-person meetings. In contrast, methods which require direct personal contact (qualitative and mixed methods) are perhaps made possible by a more cooperative spirit, or they even contribute to such spirit, as these methods allow for more direct collaborative sense-making (Weick, 2000), participation, ownership, and learning in organizations (Cousins, 2003; Preskill & Torres, 1999). Mixed methods may occupy a middle position or a compromise.

At the same time, however, mixed methods share documentation power with quantitative methods, and documentation power may be most needed when there is some level of disagreement in the organization. The level of cooperation in the organization may influence both the choice of mixed methods and the subsequent use of the findings in ways that suggests compromises and tensions are at play.

Contribution to the Field of Mixed Methods

Our first contribution is that we have demonstrated empirically that workplace assessments with mixed methods have higher utility than other workplace assessments, especially higher than the quantitative methods used routinely, but also, in some respects, significantly higher utility than if qualitative methods are used in these assessments. It is highly encouraging for the field of MMR

that our large-N study has demonstrated advantages of MMR and a consistent high score an all aspects of practical utility that we studied.

Another contribution rests with our potential explanation of this particular utility in mixed methods. We found that mixed methods do not produce particularly novel findings (no methods do), but mixed methods share perceived reliability with qualitative methods and documentation power with the quantitative methods. So, if mixed methods have advantages in our material, they are more like a patchwork than a uniform function of a special and unique paradigm distinct from all monomethods. But it is a successful patchwork since mixed methods have low scores in none of the aspects of knowledge we have investigated (propositions 2–4). Mixed methods seem to borrow some advantages from monomethods point by point without getting the disadvantages.

Mixed methods also have an organizational life. We found mixed methods were associated with a balanced influence of various stakeholders, a relatively high influence of upper management without sacrificing the influence of local partners (consistent with proposition 5). Mixed methods facilitate employee engagement (proposition 6) as well as do qualitative methods, and much better than quantitative methods (which more often than not amounts to a standardized questionnaire in our workplace assessments). Qualitative methods are statistically associated with low levels of organizational conflict, and quantitative methods with high levels, with mixed methods between the two.

The associations between methods and organizational variables are as strong or stronger as the associations between methods and aspects of the knowledge produced by workplace assessments. This suggests that organizational relations and the interests of stakeholders play a strong role for the choice of mixed methods and for their utility.

For six out of seven propositions, we find that mixed methods are not distinct from monomethods in general but instead resemble only one of the monomethods, while quantitative methods and qualitative methods often have significantly different characteristics. These results are not consistent with a view of mixed methods as philosophically unique as compared to monomethods in general. To explain our findings, it is more useful to think of mixed methods as a hybrid rather than as a unique paradigm. Mixed methods seem to use *a clever strategy, which is to borrow advantages from qualitative methods, but not their weaknesses, while still keeping the same level of documentation power and management support as the quantitative methods.*

Our findings do not lend support to further thoughts about mixed methods as a distinct and unique paradigm. Instead, in our study, mixed methods seem to provide a workable compromise between the concerns of different stakeholders in organizational settings, a view consistent with Schwandt and Lichty (2016).

Limitations

The study has limitations. There is a price for our extensive study with a large N. We depend on our respondents to tick boxes in our survey which represent methods they believe were used to collect data for their workplace assessments, which says relatively little about their methodological understanding. There may also have been additional methodological work that they do not know about (at earlier points in time or in other parts of their larger organization), but this additional work may have limited impact on the use of the workplace assessment that our respondents are reporting on.

We also do not know each organization's approach to data analysis. Given the workplace assessments we have physically seen, what we have categorized as quantitative methods of data collection typically results in numbers and graphs, while the qualitative methods typically result in memos and free text (although this is not logically binding).

While mixed methods are operationalized as the choice of both quantitative and qualitative methods in the same process, our extensive survey data do not allow us to go into depth with what is mixed and how much (Greene, 2007). Although analytic integration of findings may be beneficial (Fetters & Freshwater, 2015), and for some even a part of the definition of MMR (Yin, 2006), integration is not always recommendable (Symonds & Gorard, 2010). Without integration, there might be more attention to different voices (Fisher & Freshwater, 2015, p. 670; Greene, 2008). In complex organizational settings, MMR perhaps implies some parallel use of different methods among managers and employees. A low degree of integration might not necessarily constitute a threat to the practical utility of MMR. However, it is a limitation that our study has not lifted the heavy empirical burden of accounting for the degree of integration of multiple methods used in the same workplace assessment.

These assessments usually cover a wide range of physical and psychosocial risks, some of which may be unspecific or unknown when the assessment is designed. When knowledge is produced about phenomena with little specificity, there may be several purposes, theories, and questions in play (Schoonenboom, 2016; Schoonenboom & Johnson, 2017). In the case at hand, we cannot determine the strength and weaknesses of mixed methods in relation to very specific questions, which is an important criterion for some (Yin, 2006). On the other hand, in the practical world, mixed methods may be used to answer several questions at the same time. We do, however, keep the institutional framework and larger official purposes of workplace assessments constant in our analyses of 1801 cases.

We do not know the degree of competence with which the workplace assessments are designed. As they take place in mode II contexts and outside academia, some assessments may be custom-tailored, homemade, and influenced by pedestrian concerns and negotiations among organization stakeholders. When methods are studied in the real world rather than in textbooks, these constraints are inevitable and must be considered when drawing the broader implications of the study. At the same time, we consider it important for the development of MMR as a field to study actual mixed methods rather than to merely prescribe ideal mixed methods.

Our operationalization of the practical utility of MMR hinges on occupational safety and health representatives as informants. However, we complement their subjective assessment of the utility of workplace assessments with additional measures of actual actions and action plans. Our respondents provide many examples of actions actually taken (in open questions in our survey), so we believe our measures of utility are stronger than just attitudinal variables, and mixed methods have robust scores across all our measures of practical utility.

Correlation is not causation. Mixed methods may not have an independent causal effect on use. Mixed methods and their use may be parts of larger organizational patterns, where many factors interact and reciprocal causality may be common. For example, the fact that method choices depend on the level of organizational conflict suggests that in some situations, mixed method may be a proxy for underlying organizational variables rather than an independent paradigm with its own effects on knowledge-creation.

The most serious threat to a belief in the independent power of mixed methods might lie in the underlying role of effort, engagement, and cooperation that some organizations afford in the workplace assessment process. More effort may lead to more methods and more action, but it might be the effort rather than the methods, which makes the difference. So, although the strong correlations we have found between methods and organizational variables support the relevance of a practical and stakeholder-based perspective on MMR, the same perspective cautions against exaggerated attribution of causal effects to methods in isolation. However, while an absence of unidirectional causality may be a critical problem for causal analysts, it is no obstacle for practitioners who see their mixed methods as interacting with organizational contexts in dynamic ways, also trying to change the context in which they are a part.

Implications

An implication of our findings relevant for MMR practitioners is that beyond textbook prescriptions, it is important to pay attention to the organizational contexts which shape the social life of mixed methods in practice. Mixed methods may be a clever response to diverse needs for knowledge among various stakeholders, but that does make dilemmas disappear. For example, patterns of cooperation and conflict may have an influence on the organizational choice of methods, but methods may also "talk back," for example, by inviting stakeholders to participate and/or by providing documentation that can be used to convince others about the state of affairs in the organization, which may be useful particularly in the absence of consensus. In practice, it may be fruitful to attend to MMR not as a separate paradigm but as a patchwork requiring a lot of actual patching. Consistent with a situated practical view on mixed methods, which respects issues of influence and even power (Torrance, 2018), MMR researchers should pay special attention to the influence of various stakeholders, their engagement and collaboration as key factors contributing to the practical utility of MMR.

Do our findings fly? With 1801 cases, our empirical material is not small, but it remains confined to a particular empirical field (public sector organizations in Denmark), and a particular form of assessment embedded in a specific legal framework. If the organizational requirements on cooperation between management and employees in Danish workplace assessments explain why we found such a strong association between organizational variables and the use of mixed methods, a similar mechanism might also operate in other contexts where methods are used in collaboration between different stakeholders (Pawson & Tilley, 1997). A cooperative spirit may enhance mixed methods and their use, but the link between methods and organizational conflict may indicate that when organizational conflict is intense, perhaps MMR is not chosen when the ground is not fertile. At the same time, mixed methods share documentation power with quantitative methods, and there is more need for documentation power in the absence of consensus in the organization. If some stakeholders use a workplace assessment for learning purposes, while other use it for documentation purposes, the net contribution of a mixed methods assessments may still be positive, even in situations where all stakeholders do not agree about the optimal design of the assessment. Instead of seeking to overcome all tensions, and then choose the optimal design, it may be recommendable to acknowledge that tensions exist and that mixed methods may be a good compromise or at least a way forward.

The link between mixed methods and organizational variables is indeed a very real link, both in positive and negative terms, but it is best understood as a set of contradictory forces and dilemmas. Only future studies may reveal how the specific strengths and weaknesses of mixed methods may vary from one domain to another (Buchholtz, 2019).

Conclusion

We found that mixed methods have high scores on all aspects of practical utility that we have measured. Mixed methods are significantly associated with subsequent action taken in both the physical and the psychosocial domain, with the awareness of action plans, and with subjective assessments of the utility of workplace assessments.

We reiterate that correlation is not causation, but the correlations we have found with types of knowledge produced and with organizational variables give substantial food for thought about the drivers of the utility of mixed methods in practical organizational life.

Mixed methods share perceived reliability with qualitative methods and the power to provide documentation with quantitative methods. Mixed methods are associated with a balanced influence of different stakeholders. Mixed methods are linked with influence to upper management

in the same way as quantitative methods but do not sacrifice the influence to local stakeholders as much as quantitative methods.

Mixed methods share a high degree of employee engagement with qualitative methods. There is a link between methods in workplace assessments and organizational conflict. Quantitative methods are associated with high conflict on the average, and qualitative methods with low conflict, with mixed methods between them.

Our findings do not support a view of mixed methods as distinct from monomethods in general. Instead, we see mixed methods as a hybrid that inherits particular characteristics of each of the monomethods. Mixed methods are found in workplace assessments which are deemed more reliable than the quantitative ones, as they escape the alleged superficiality characteristic of the typical quantitative survey. Instead, MMR inherits productive aspects known from qualitative methods, such as local influence and employee engagement. At the same time, mixed methods escape the downsides of qualitative methods, that is, incongruence with the preference of upper management and lack of fit with documentation purposes. In these two respects only, mixed methods have more in common with quantitative methods. This navigation between different organizational concerns, where advantages are shared with one monomethod at a time, but not downsides, may help explain why mixed methods end up with significant scores on all aspects of practical utility that we have measured.

In conclusion, mixed methods have significant, documented practical utility, but it is time to rethink the underlying sources. Our findings suggests that the strengths of MMR may lie less in any uniqueness in mixed methods per se as compared to monomethods in general, but instead in how MMR as a successful hybrid accommodates diverse practical concerns situated in broader patterns of influence, cooperation, and engagement.

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