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Triangulation and integration: processes, claims and implications

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ABSTRACT Researchers who advocate the use of multiple methods often write interchangeably about ‘integrating’, ‘combining’ and ‘mixing’ methods, sometimes eliding these descriptors with ‘triangulation’, which itself encompasses several meanings. In this article we argue that such an elision is problematic since it obscures the difference between (a) the processes by which methods (or data) are brought into relationship with each other (combined, integrated, mixed) and (b) the claims made for the epistemological status of the resulting knowledge. Drawing on the literature for examples, we set out different rationales for using more than one method, then we develop a definition of *integration of methods* as a specific kind of relationship among methods. We also discuss different places in the research process where integration can occur: for instance, data from different sources can be integrated in the analysis stage, or findings from different sources at the point of theorizing.

KEYWORDS: *integration, mixed methods, multiple methods, triangulation*

Introduction

The potential for ‘knowing more’ about a phenomenon through the use of different research methods in one empirical investigation is often discussed under the rubric of ‘triangulation’. In these discussions, the terms ‘integrating’, ‘combining’ and ‘mixing’ methods tend to be used interchangeably, eliding these descriptors with the concept of triangulation. We contend, however, that this elision is problematic because it obscures an essential difference between the *outcome* of using mixed methods (claims to triangulation)

and the *process* by which different methods and datasets are brought into relation with each other. We argue for the importance of paying attention to the practices and processes involved in bringing multiple methods and datasets together, with a particular focus on the notion of integration. We propose that integration in multi-methods/multi-data research must be understood as a particular practical relationship between different methods, sets of data, analytic findings or perspectives, while triangulation incorporates an epistemological claim about the outcomes of the research.

This article focuses on the use of mixed methods within single empirical investigations. We define 'mixed methods' as the use of two or more methods that draw on different meta-theoretical assumptions (i.e. that are cross-paradigmatic). Mixed-methods studies can include 'standard' positivistic-quantitative and interpretive-qualitative components, or a mix of different qualitative data (positivistic, interpretive, phenomenological, visual).¹ We start by setting out the various rationales put forward by researchers for using more than one method to investigate social phenomena, and then go on to draw distinctions among the concepts of triangulation, integration and combining methods. In particular, we define 'integration' and set out what it means to claim that mixed methods are integrated in a research design. We draw on the literature to demonstrate different practices involved in the harnessing of different research methods, unpacking the differences between the process versus the outcome of mixing methods; the techniques used versus the knowledge generated through mixing methods; and integration across datasets versus integration across research methods. We also explore the points in the research project at which integration can occur, notably in conceptualization, analysis and theorizing.

Using mixed methods

The use of more than one method in social research has a long history (Erzberger and Prein, 1997); indeed, as Fielding and Schreier (2001) point out, some 'methods' such as ethnography have always involved several data sources. In recent times, mixed methods have been actively promoted, particularly in relation to research concerning social problems and the evaluation of social intervention programmes (Greene et al., 2001). However, this promotion of an eclectic approach to generating empirically based knowledge does not stem from a homogenous positioning of what it is that is achieved when multiple data are brought to bear on a research question. In fact, mixed methods are incorporated into research designs for different reasons and in varying ways. Different approaches to mixed methods reflect epistemological debates about the status of the data produced by different methods, and these have implications for the way researchers see the relationships among findings generated by methods situated within distinct theoretical perspectives. For example, mixed methods are seen to have several distinct benefits: increasing

the accuracy of research findings and the level of confidence in them (e.g. Kelle, 2001); generating new knowledge through a synthesis of the findings from different approaches (e.g. Foss and Ellefsen, 2002); hearing different voices and bringing into play multiple constructions of the phenomenon (Moran and Butler, 2001); reflecting the complexity and multi-faceted ontology of a phenomenon (Boaler, 1997; Coyle and Williams, 2000; Deren et al., 2003); or logically implementing a theoretical framework (Bowker, 2001; Coxon, 2005; Nash, 2002; Pawson, 1995).

The literature also suggests that the use of mixed methods reflects trends within certain disciplines or sub-disciplines. For example, there has been extensive use of mixed-methods research designs in education (see, for example, Boaler, 1997; Nash, 2002; Punch, 2005) and in health (Barbour, 1999; Foss and Ellefsen, 2002). Indeed, multiple approaches are now considered to be essential underpinnings to whole programmes of research for some social problems (Mazur and Parry, 1998; Oakley, 1998; White, 2002).

So, using mixed methods is commonly seen as a valuable research strategy. We now turn to what specifically is gained in comparison to using one method, focusing first on the various conceptualizations of 'triangulation'.

Outcomes: what triangulation achieves

Triangulation is an epistemological claim concerning what more can be known about a phenomenon when the findings from data generated by two or more methods are brought together. The concept of triangulation has been comprehensively reviewed, developed and debated by a number of authors (see, for example, Bryman, 2004; Greene et al., 2001; Kelle, 2001), so here we will just summarize the issues to emphasize their epistemological nature.

In social science, triangulation initially referred to the claim that comparing findings from two or more different research methods enables the researcher to conclude whether an aspect of a phenomenon has been accurately measured, just as comparing several measurements of a geographical area allows a more accurate mapping of the territory. This claim rested on the assumption that if different research methods produced similar results about a phenomenon then accurate measures had been used. In contrast, if they produced divergent results, one or more of the 'measurement instruments' were flawed (Campbell and Fiske, 1956). In this model of triangulation, each method was seen to include unavoidable biases, but these were seen to offset each other (Webb et al., 1966). Importantly, the possibility that different methods might have similar flaws which amplify and, thereby, hide error has been ignored (Fielding and Fielding, 1986). Thus, at the heart of this model of triangulation is the increased confidence in the implied measurement outcomes of the research where there are convergent findings. We call this the 'increased validity' model of triangulation.

Objections to this epistemological claim have been generally predicated on a view that, in projects mixing qualitative and quantitative methods, paradigmatic differences between positivist and interpretivist accounts of the nature of social reality nullify the interpretation of convergence as an indicator of measurement validity (see, for example, Lincoln and Guba, 1985; Smith and Hershuisius, 1986). In response to this, advocates of triangulation in what we may call cross-paradigm projects argue for an extension of the conceptualization of triangulation in the light of theorizing the social world as complex and multi-faceted. They suggest that, while validity of measurement cannot be claimed, methods can be triangulated to reveal the different dimensions of a phenomenon and to enrich understandings of the multi-faceted, complex nature of the social world.

In other words, this view replaces the idea that different results suggest flawed measurement with the idea that different results reflect different aspects of a phenomenon. This approach has been described as generating complementarity (e.g. Greene et al., 1989) and has become a common way in which mixed methods are now said to have been 'triangulated'.

Some researchers take up a middle-ground position where they reject the 'increased validity' claim, retain an acceptance of the significance of methodological paradigms, but remain open to the value of triangulation in generating more knowledge about a phenomenon. Sale et al. (2002), for example, take this line. They take up the view that the paradigms which underpin quantitative and qualitative methodological approaches rest on apparently incompatible assumptions about how we understand and theorize notions of reality, and so cannot be combined to produce increasingly accurate approximations to the 'truth' of a phenomenon. However, they argue that these approaches can still be combined to study complex social phenomena because that complexity itself consists of both 'interpretivist' and 'positivist' phenomena.

Commensurate with this, other advocates of triangulation emphasize the necessity of using mixed methods to understand the social world from theoretically driven bases. Rather than focusing on the ontological complexity of social phenomena, these authors suggest that social phenomena operate on different levels – specifically, those of structure and agent (Boaler, 1997; Hartnoll, 1991; Kelle, 2001; Nash, 2002). In this respect, the use of multiple methods to generate appropriate types of data is held to be essential to the development of robust sociological explanations of the social world. Kelle (2001) makes a strong case for this, arguing that for those empirical questions about phenomena, which operate at both macro and micro levels, one method alone cannot offer a sufficient basis for sociological explanation. Indeed, Kelle urges a reclaiming of the original navigational/cartographic meaning of triangulation wherein an accurate identification of a position requires at least two measures. In mapping terms, the required measures are sightings from two known points, including at least one distance and one angle measurement (Kelle and Erzberger, 2004: 174). In social research terms, Kelle argues, the

necessary measurements include at least one macro/meso-level measure and one micro-level reading.

Alternative theoretical positions concerning the nature of social reality such as postmodernism and post-positivism have also provided a rationale for the use of multiple methods to capture complexity and multiple contexts of a phenomenon (e.g. Bowker, 2001).

In effect, then, the meaning of triangulation has been broadened since it was first imported into the social sciences. Researchers have expanded claims of what triangulation achieves, and what it allows researchers to conclude both about social phenomena and about the research process. Triangulation still remains an epistemological claim for the outcome of mixed methods, but the nature of that claim is less concerned with validity of findings per se, and more frequently concerned to engage with the multiplex, contingent nature of the social world (Fielding and Fielding, 1986). This, in effect, dissolves the difficulties concerning the interpretation not only of convergence but also of divergence in findings generated by different methods.

Other advocates of mixed methods steer away from the language of triangulation, locating themselves instead in theoretical positions which fundamentally challenge conventional philosophical divisions between different methods. One argument here for the use of mixed methods is a pragmatic one which rests on seeing methods in a technical rather than epistemological frame (Bryman, 1988: 127). This case is also put by authors such as Tashakkori and Teddlie (2003), and Greene et al. (1989) who point out that researchers engaged in applied research pay little attention to paradigm differences in actual research practice, and different methods are not treated as exclusive to a particular perspective.

An alternative position proposes a continuum principle, which argues that the dichotomy drawn between quantitative and qualitative approaches is artificial (Brewer and Hunter, 1989; Caracelli and Greene, 1997). Other researchers make the case more strongly, suggesting that differences between qualitative and quantitative paradigms are illusory (Coxon, 2005; Howe, 1988; Pawson, 1995). Here, researchers may adopt a single theoretical framework which unites the different methods and data types in one paradigm (theoretical unison).

The process of mixing methods

Many authors are not precise in distinguishing between triangulation outcomes or theoretical unison, and the use of mixed methods for other purposes. Greene et al. (1989) identified three uses of multiple methods that did not involve triangulation: the use of one method to inform the design of another method, with the latter often seen as more significant for answering the research question; the use of mixed methods or perspectives to increase depth or breadth of data generated; and the use of mixed methods to

encompass multiple components in a single empirical project. Indeed, the term triangulation is sometimes used, without any epistemological status attached, simply to indicate that more than one method was deployed in the research. Our own research,² into the practices and processes involved in using mixed methods (the PPIMs project), suggests this 'loose talk' obscures important conceptual differences between the processes of generating findings using mixed methods and the epistemological outcomes that can be claimed.

In our study, we aimed to make visible the intellectual and practical work involved in using different methods and different methodological approaches to studying a substantive area. To do this, we conducted five small investigations into the topic of 'vulnerability', exploring how this concept differs when viewed through a variety of epistemological lenses (quantitative, qualitative and visual), and across a range of populations (whole households, people living alone and people who are homeless). Our overall aim has been to examine the processes, practices and implications associated with 'integration' at each stage of the research process, from conceptualization through to interpretation of findings. Emerging out of our own critical reflections in the project is a sharp awareness that *integration* is a particular type of relationship among methods, data, analytic methods, or theoretical perspectives, which carries significant implications for how that part of the research process functions. In the rest of the article, we focus on the concept of integration and some of the implications it has for the research process.

The concept of integration

Semantically, to integrate is 'to combine (one thing) with another to form a whole' (Oxford Dictionary of English, 2003). In other fields, such as electronics systems, communities of people, or transport facilities, integration denotes a relationship among objects that are essentially different to each other when separate but which comprise a coherent whole when they are brought together. The material differences of those separate entities are not erased, but work synergistically to produce a whole that is greater than the sum of its parts. Integrated transport provides a model of integration which we find useful as a metaphor for understanding methodological integration in cross-paradigm research. In transport, integration is 'the principle of ensuring transport modes operate in conjunction with one another' (Commission for Integrated Transport, UK, 2005). Ideally, an integrated transport system allows a passenger to purchase one ticket for the whole journey despite changing between modes of travel (bus, train, plane), and alight from one vehicle and board the next at the same location and with minimum waiting. In other words, to change vehicles effortlessly in pursuit of the goal of reaching a destination. In this system, the process is smooth, efficient and relatively trouble-free for the passenger because of the ordered, integrated relationships between the different modes of transport.

Similarly, in mixed-methods research, we argue that 'integration' denotes a specific relationship between two or more methods where the different methods retain their paradigmatic nature but are inter-meshed with each other in pursuit of the goal of 'knowing more'. We describe the greatest level of integration as *integrated methods*, in which the inter-meshing occurs from conceptualization onwards to the final reporting of the research. Many mixed-methods projects integrate at later stages of the process. In this case, each method may be operationalized at some distance from the others, and/or the data sets may be brought together only at the point of analysis, interpretation or theorizing. Integration, as we define it, may still occur. At each of these points, though, researchers must be clear about the process that generates the integrated relationship and the inevitable implications for subsequent analysis, interpretation and theorizing. The integrated relationship, by itself, does not imply any particular epistemological claim – that must be based on a theoretical position concerning the intended purpose of bringing the mixed methods together.

Integration, then, involves the generation of a tangible relationship among methods, data and/or perspectives, retaining the integrity of each, through a set of actions clearly specified by the research team, and that allows them to 'know more' about their research topic. (The specific ways they 'know more' depend on their particular theoretical and epistemological approaches.) We will provide examples of the various types of integration shortly. But there are other means of mixing methods which do not involve integration, which we describe as 'combining' methods. We will provide examples of this next, in order to differentiate more clearly the concept of integration in mixed methods from other approaches.

COMBINING METHODS – NOT INTEGRATION

Methods may be *combined* rather than integrated. For example, it is not uncommon for a qualitative method to follow after a quantitative one to 'flesh out' the quantitative findings (e.g. Clarke, 2003), or, alternatively, to precede the design of a survey to inform the content of the questionnaire. Here, the qualitative component is an adjunct to the quantitative, improving its depth or quality, rather than positioned as making an equal contribution to knowledge about the phenomenon (Greene et al., 1989). Also along these lines, methods may be combined in more focused and innovative ways. Gobo (2001), for example, used conversation analysis to improve the response rate to a telephone survey. He used findings from the conversation analysis to redesign the survey, which improved the response rate at initial contact and, thus, the representativeness of the sample. Here, quite different methods were used (conversation analysis and a quantitative survey), but not to answer the same research question.

Punch (2005: 246) identifies three key points for consideration when using mixed methods: whether the methods are taken as equal; whether or not they

influence the operationalization of each other; and whether they are conducted simultaneously or sequentially. Building on this, we would argue that the decisions taken in respect of the first two points have a critical bearing on whether the methods can be said to have been combined or integrated. We argue that integration requires that different methods (or types of data) are given equal weight, and, with respect to operationalization, that they are orientated to a common goal or research question and are, therefore, necessarily interdependent while retaining their paradigmatic modalities – in metaphorical terms the bus remains a bus, and the train a train, but there is a clear mechanism which creates an appropriate and effective interface between them.

INTEGRATED METHODS

Pawson (1995) and Coxon (2005) argue for research where methods have been integrated at the outset and remain integrated in the processes of data analysis and interpretation. In the examples they cite from their own work, integration is accomplished at a practical as well as theoretical level.

Pawson (1995) argues strongly for an approach which uses mixed methods to fuse the domains of 'structure and agency, of individual and institutional, of the macro and the micro' to generate 'ontological synthesis' (p. 9), rather than what we have described as a complexity approach (which he characterizes as taking 'a bit of this and a bit of that to form a more complete picture', p. 9). He is critical of multiple methods/multiple data approaches which primarily generate more data about a phenomenon without addressing how the plurality of data will be combined analytically. In this respect, he calls for more explanation of the 'mechanics of data collection and data analysis through which the qualitative and quantitative are fused' (1995: 10). In his own work – for example, in evaluating a prison education programme – he integrated qualitative and quantitative methods to generate more appropriate data and a more insightful analysis of 'what works' in prison education. In this study, initial interviews with prison educators, which explored what they thought 'worked' in terms of being able to divert an inmate from further crime after they were released, provided data which he used to generate variables and hypotheses which were, in turn, integrated into the analysis of quantitative data derived from case files. This fusion allowed him to address the question: 'what is it about the [educational] programme that works for whom?' (p. 25). Subsequently, he interviewed inmates using a combined structured and unstructured interview design in what Pawson entitles 'the realist interview'. This type of interview incorporates structured questions developed out of the earlier interviews and quantitative data analysis which invite the respondent to interact with the knowledge generated from the earlier methods, and to 'agree, disagree and to categorize themselves in relation to the attitudinal patterns as constructed in such [interview] questions but also to refine their conceptual basis' (p. 37).

Pawson argues that this integration, which occurs through the interaction

of the beliefs of different respondents and the response of individuals to macro-level, quantitative findings in the realist interview, allows the generation of mutual knowledge. He suggests that techniques such as vignettes also generate mutual knowledge in that the researcher has contributed the knowledge derived from other empirical or theoretical work and the respondent contributes the knowledge of themselves in the situations under investigation.

This example illustrates one type of integration of methods (which Pawson names 'synthesis'). The practicalities of integration here involved pre-planning, the maintenance of the modalities of the different types of data while at the same time dissolving barriers among them. The methods are not 'transformed' one to another but they do interface and enmesh with each other.

A second, different, example of integrating methods is evident in the work of Coxon (2005), who positions the general nature of phenomena as being both quantitative and qualitative (see also Nash, 2002, on this perspective). Coxon proposes that integrated methods can be developed which access both qualitative and quantitative aspects of a particular phenomenon to provide a fuller understanding of it. Drawing on his earlier work, he shows how an inter-related analysis does not treat data as either exclusively quantitative or qualitative, since data are not dichotomized in that way at the point of generation. In a project on the sexual lives of gay men, participants provided data in a structured diary format. The diary elicited particular elements of interest to the researchers, but also enabled participants to generate textual narratives of their sexual encounters. The resulting data could then be analysed both quantitatively and qualitatively, blending the findings into a coherent account. Similarly in a study of occupational hierarchies, Coxon developed a technique that generated quantitative ranking data, spatial data and qualitative data on occupational hierarchies. This multiplex data is integrated and is viewed as constitutive of respondents' conceptualizations of occupations in a hierarchy rather than as separate 'types' of data. Coxon identifies a challenge in analysing the integrated data associated with the practicalities of what is needed, in terms of technical software, to enable the data to be 'related and retrieved in context' (2005: para. 9). Thus, he shows that it is possible to create a dataset in which the everyday integration of quantitative and qualitative aspects of phenomena such as occupational hierarchies becomes evident and observable, but the analytic software and techniques currently available do not yet meet the demands that follow on from an integrated methods design such as this.

So, the integration of methods has significant implications for the practical means by which the data are generated and the practical means by which they can be analysed. Given this, it may not be surprising to find that most mixed-methods designs defer integration to the point of analysis or indeed to the point of theoretical interpretation. While some researchers may argue that this is not integration, we disagree and argue that integration is still achieved at these

levels. Nevertheless, we reserve the term 'integrated methods' for those studies in which integration occurs from the point of conceptualization and across all phases of the research.

SEPARATE METHODS, INTEGRATED ANALYSIS

The challenge of an analysis that is integrated in any sense lies in developing some form of common analysis of a diverse set of data without losing the characteristics of each type of data. One approach would be to analyse each set of data within the parameters of its own paradigm but addressing common analytic questions. Alternatively, the approach described by Coxon (2005) interweaves the analysis among the different types of data.

We have developed another approach we call 'following a thread' (Moran-Ellis et al., 2004). In our project, we used multiple methods in one investigation to generate several datasets, which include quantitative, interview, narrative, visual (maps, photos) and multimedia (video) data. We positioned all the datasets alongside each other conceptually, and started with an initial analysis of each within the relevant paradigm parameters to identify key themes and analytic questions requiring further exploration. Based on the literature and the original research questions, we picked an analytic question or theme in one dataset and followed it across the others (the thread) to create a constellation of findings which can be used to generate a multi-faceted picture of the phenomenon. This, in effect, is an analysis led in the first instance by a grounded inductive approach but developed through a focused iterative process of data interrogation which aims to interweave the findings that emerge from each dataset. The value of this integrative analytic approach lies in allowing an inductive lead to the analysis, preserving the value of the open, exploratory, qualitative inquiry but incorporating the focus and specificity of the quantitative data.

Kelle (2001) describes a somewhat similar process, but he capitalizes analytically on divergences and tensions in findings from different sets of data. In one example, he shows how a finding from a quantitative panel study – a statistically significant correlation between access to training for workers in particular occupations in Germany and sex of respondents – provides evidence of gender discrimination, but cannot illuminate the micro-social processes by which the discrimination occurs. A linked set of qualitative data enables an exploration of these processes. Kelle emphasizes the opportunities afforded by multiple methods in understanding how occupation, training, gender and social class interact both at the structure and at the agency level. Without both sets of data, the interplay between the macro-level findings that uncover links between gender and occupational type, and the micro-level findings that show the processes of individual choice and action, would remain unobserved and, therefore, could not be incorporated into an explanation of how the occupational and educational system mediates social and gender stratification. Thus, while the data are separate (although linked in the sample) they are

integrated via analysis and then given equal weight in their contribution to theorizing the relationship between macro-, meso- and micro-social processes.

Another example of an integrated analytic process is that described by Bazeley (2002), where quantitative and qualitative data are brought together in a qualitative data analysis software program (N-Vivo), which can hold different types of data and allows researchers to make links across them.³ The technical mechanisms available in recent versions of this software enables the researcher to generate various kinds of quantitative analyses of the qualitative data, and to co-produce the qualitative and quantitative findings, retaining the link between the qualitative data which has been rendered in a quantitative format. Again, as in our approach, the integration of the different types of data at the point of analysis follows separate production of those data.

However, the generation of one analytic approach which combines quantitative and qualitative data walks a narrow path between the transformation of one data type to the other for the purposes of analysis (Caracelli and Greene, 1997) and an integrated analysis where the differences in the nature of the data become immaterial but are not eradicated. The former approach can be seen in the example of Gray and Densten (1998) who use a 'top-down' latent variable analysis approach to analyse both qualitative and quantitative data generated in their research into how managers of small businesses perceive their success. In a comprehensive account, they show how the principles of latent variable analysis guide the analytic decisions and interpretations that are made, and the quantitative paradigm leads the research.

SEPARATE METHODS, SEPARATE ANALYSIS, THEORETICAL INTEGRATION

Finally, data generated by different methods may be integrated only at the point of theoretical interpretation, each having been analysed within the parameters of its own paradigm. Integration at this point of the research process is interpretive integration where an explanation is generated from the empirical work which incorporates the knowledge produced by the different methods, blending it into a coherent account (see Green, 2003, for an example of this). This particular approach does not combine the methods or the analysis, but, rather, takes each set of findings and brings them together into one explanatory framework. This differs from Kelle's (2001) approach in that there is little or no interaction between the datasets during the analysis process. This means that contradictions, divergences and convergences in the findings produced by each analysis are reconciled only at the point of interpretation and explanation. Reconciliation may be achieved with difficulty (see Perlesz and Lindsay, 2003, on dealing with dissonant data) or accomplished through deferring the resolution to the reader by allowing multiple accounts to stand alongside each other to reflect polyvocality (e.g. Moran and Butler, 2001).

Conclusion

Integration in mixed-methods research can take place at several points in the research process. We reserve the term 'integration of *methods*' for studies in which the inter meshing of methods occurs from the earliest conception of the project, but also recognize approaches, which, for theoretical or pragmatic reasons, situate integration of data, findings or perspectives in other parts of the research process. Regardless of the point at which it occurs, we argue that integration generates a specific inter meshed relationship between methods and/or data while, crucially, retaining the modalities of the different paradigmatic approaches. It is the outcome of this inter meshing, rather than the process that achieves it, which can then be positioned epistemologically. The integrated relationship does not in itself imply anything about what can be claimed; such claims are made on the basis of the researchers' theoretical perspectives and their positions on, for instance, triangulation and complexity. Where one method is subsumed to the other in terms of the weight of its contribution to the research question, or, where one type of data is transformed into another paradigmatic format for single analysis, then, 'integration' is not an appropriate description of the relationship between the methods or datasets. On the other hand, where data generated by different means are brought together at the level of analysis or theory to generate an overarching account of the phenomenon, then we may speak of analytic or interpretive integration. However, the practicalities of these types of integration must be set out in descriptions of the process by which the findings were integrated.

As the warrant for methodological pluralism has become more widely accepted, the recognition of the value of using different or mixed methods needs to be accompanied by a recognition of the pragmatic and epistemological implications of how those methods are to be brought into relationship with each other in a particular study. These processes merit close attention since it is in the *practices* of social research that the potential for epistemological claims are created: in the practicalities and the pragmatics of generating, analysing and interpreting data. Finally, we would argue in support of methodological pluralism since even in studies where, for pragmatic or epistemological/ontological reasons, a decision is made not to include mixed or multiple methods in the research design, a willingness to explore their use and potential contribution (whether that be in combination or integration) enriches both the theoretical and epistemological approaches taken to the topic in question.

NOTES

1. Some of the literature we review divides social science into two dichotomous paradigms, qualitative (interpretive) and quantitative (positivistic). We believe that this oversimplifies the nature of social theorizing, on the one hand, because types of data do not necessarily imply a particular paradigm – for instance, qualitative research can in fact be positivistic. Similarly, visual data can be analysed from a

realist perspective as documentation, or it can be translated into verbal/textual information, or it can be left in the form of visual knowledge, which is said to differ from other types of knowledge. On the other hand, the simple dichotomy between qualitative and quantitative is unhelpful because the meta-theoretical assumptions that underpin different paradigms are multiple and complex. Indeed, social science embraces many 'paradigms' that vary along multiple dimensions, including epistemology, ontology and conceptions of the nature of human action.

2. ESRC award H3 33250054: *Investigating Practice and Process in Integrating Methodologies: A Demonstrator Project*. Focusing on a substantive concept, this project investigates the methodological issues that arise in multi-method and multi-level approaches to a research question concerned with how 'vulnerability' is perceived, experienced and responded to in everyday life and at the planning/policy level. The project is funded by the ESRC under the Research Methods Programme: <http://www.ccsr.ac.uk/methods/>
3. For information on N-Vivo and other computer assisted qualitative data analysis software programs, and a review of their capacities to deal with quantitative and qualitative data together, see the CAQDAS Networking Project website: <http://caqdas.soc.surrey.ac.uk/>

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