

CHAPTER 17

DATA ANALYSIS I: OVERVIEW OF DATA ANALYSIS STRATEGIES.

Julia Brannen and Rebecca O’Connell

KEY TERMS: Mixed method research; data integration, survey, qualitative data

CHAPTER OBJECTIVES

1. The chapter enables the reader to consider issues that are likely to affect the analysis of mixed method research.
2. It identifies the ways in which data from MMR can be integrated in principle and gives detailed examples of different strategies in practice.
3. It examines a particular type of MMR in which national survey data are analyzed alongside a qualitative study whose sample is drawn from a national survey. By working through three analytic issues, it shows the complexities and challenges involved in integrating qualitative and quantitative data.

INTRODUCTION

The chapter begins with a consideration of the conditions under which integration is possible (or not). A number of factors that need to be considered before a researcher can decide that integration is possible are briefly discussed. This discussion is followed by a consideration of Caracelli and Greene’s (1993) analysis strategies. Examples of mixed method studies that

involve these strategies are described and the ways they attempt to integrate different data, in particular data transformation, examination of typologies and outlier cases, and the merging of data sets. It is shown that these strategies are not always standalone but can merge into each other. The chapter concludes with a discussion of an extended example of the ways in which a study called Families, Food and Work (2009-14) sought to employ analysis of relevant questions from different large scale data sets with data from a qualitative study of how working parents and children negotiate food and eating.

ISSUES TO CONSIDER BEFORE DOING MIXED METHOD RESEARCH AND ANALYSIS

There are a number of issues that the researcher should consider before embarking on mixed and multi method research [MMR], that need to be revisited in the analysis of the data.

The first concerns *the ontological and epistemological assumptions* underpinning the choice of methods used to generate the data. Working from the principle that the choice of method is not made in a philosophical void, the data should be thought about in relation to epistemological assumptions underpinning the aspect of the research problem/question being addressed (see for example Barbour, 1999). Thus in terms of best practice, researchers may be well advised to consider what kind of knowledge they seek to generate. Most MMR researchers, while not necessarily thinking of themselves as pragmatists in a philosophical sense, adopt a pragmatic approach (Bryman, 2008). Pragmatism dominates in mixed and multi method research (Omwuegbuzie and Leech, 2005), especially among those from more applied fields of the social sciences (in which MMR has been most widespread). However, pragmatism in this context connotes its common sense meaning, sidelining philosophical issues so that MMR strategies are

employed as a matter of pragmatics (Bryman, 2008). Some might argue that if different questions are addressed in a study which requires different types of knowledge then the data cannot be integrated unproblematically in the analysis phase. However, it depends upon what one means by “integration” as we shall later discuss.

The second issue concerns *the level of reality* under study. Some research questions are about understanding social phenomena at the micro level while others are concerned with social phenomena at the macro level. Thus researchers in the former group emphasize the agency of those they study through an emphasis upon studying individuals’ subjective interpretations and perspectives and have allegiances to interpretivist and post-modernist epistemologies. Those working at the macro level are concerned with identifying larger scale patterns and trends and seek to hypothesize or create structural explanations, which may call upon realist epistemologies. However, all researchers aim to focus to some extent on the relation between individuals and society. If one is to transcend conceptually the micro and the macro levels, then methods must be developed to reflect this transcendence (Kelle, 2001). For example, in qualitative research that focuses on individuals’ perspectives, it is important to set those perspectives in their social structural and historical contexts. Whether those who apply a paradigm rationality will apply both qualitative and quantitative methods will depend upon the extent to which they seek to produce different levels and types of explanation. This will mean interrogating the linkages between the data analyzes made at these levels.

The third issue relates to *the kinds of human experience and social action* that the study’s research questions are designed to address. For example, if one is interested in life experiences over long periods of time, the researcher will employ life story or other narrative methods. In this case he or she needs to take into account the way stories are framed in particular

how they are influenced by temporal perspectives, the purposes of the narrator and the way stories are told. The data the researcher will collect are therefore narrative data. Hence how these stories fit, for example, with quantitative data collected as part of a MMR approach will require close interrogation in the analysis of the two data sets taking into account both interpretive and realist historical approaches.

The fourth issue to consider is whether the data are *primary or secondary* and, in the latter case, whether they are subjected to secondary analysis. Secondary data are by definition collected by other people, although access to them may not be straightforward. If the data have already been coded and the original data are not available, this will limit the types of secondary analysis possible. Moreover the pre-existence of these data may influence the timetabling of the MMR project and may also shape the questions that are framed in any subsequent qualitative phase and in the data analysis. Moreover, depending on the nature and characteristics of the data, one data set may prove intrinsically more interesting. Thus more time and attention may be given to its analysis. A related issue therefore concerns the possibilities for operationalizing the concepts employed in relation to the different parts of the MMR inquiry. Pre-existing data, especially those of a quantitative type, may make it difficult to reconceptualize the problem. At a practical level, the questions asked in a survey may poorly relate to those that fit the MMR inquiry, as we shall later illustrate. Since one does not know what one does not know, it may only be at later stages that researchers working across disciplines and methodologies may come to realize which questions cannot be addressed and which data are missing. The fifth issue relates to the *environments* in which researchers are located. For example, are the research and the researcher operating within the same research setting, for example the same discipline, the same theoretical and methodological tradition, or the same policy environment? MMR fits with the

political currency accorded to ‘practical enquiry’ that speaks to policy and policymakers and which informs practice, as distinct from scientific research (Hammersley, 2000). However, with respect to policy, this has to be set in the context of the continued policy importance afforded to large scale data, but also the increased scale of these data sets and the growth in the availability of official administrative data. In turn, these trends have been matched by the increased capacity of computing power to manage and analyze these data (Brannen and Moss, 2012) and the increased pressure on social scientists to specialize in high-level quantitative data analysis. As more such data accrue, the apparent demand for quantitative analysis increases (Brannen and Moss, 2012). However, MMR strategies are also often employed alongside such quantitative analysis especially in policy driven research. For example, in cross-national research, governmental organizations require comparative data to assess how countries are doing in a number of different fields, a process that has become an integral part of performance monitoring. But, equally, there is a requirement for policy analysis and inquiries into how policies work in particular local conditions. Such micro level analysis will require such methods as documentary analysis, discourse analysis, case study designs and intensive research approaches. Furthermore, qualitative data are thought useful to ‘bring alive’ research for policy and practitioner audiences (O’Cathain, 2009).

Another aspect of environment relates to the sixth issue concerning the constitution of the research team and the extent to which it is *inter or transdisciplinary*. Research teams can be understood as ‘communities of practice’ (Denscombe, 2008). While paradigms are pervasive ways of dividing social science research, as Morgan (2007) argues, we need to think in terms of shared beliefs within communities of researchers. This requires an ethic of ‘precarity’ to prevail (Ettlinger, 2007, p. 319) through which researchers are open to others’ ideas and to relinquish

entrenched positions. However, the success of communities of practice will depend on the political context, their composition and whether they are democratic (Hammersley, 2005). Thus in the analysis of MMR it is important to be cognizant of the power relations with such communities of practice since they will influence the researcher's room for maneuver in determining directions and outputs of the data analysis. At the same time, these political issues affect analysis and dissemination in research teams in which members share disciplinary approaches.

Finally, there are the *methodological preferences, skills and specialisms* of the researcher, all of which have implications for the quality of the data and the data analysis. MMR offers the opportunity to learn about a range of methods and thus to be open to new ways of addressing research questions. Broadening one's methodological repertoire mitigates against 'trained incapacities' as Reiss (1968) termed the issue – the entrenchment of researchers in particular types of research paradigms as well as questions, research methods and types of analysis.

THE CONTEXT OF INQUIRY: RESEARCH QUESTIONS AND RESEARCH DESIGN

The rationale for MMR must be clear both in the phase of the project's research design (the context the inquiry) and in the analysis phase (the context of justification). At the research design phase, researchers wrestle with such fundamental methodological questions as to what kinds of knowledge they seek to generate; whether to describe and understand a social phenomenon or to seek to explain it? Do we wish to do both, that is to understand and explain? In the latter case the research strategy will typically translate itself into employing a mix of

qualitative and quantitative methods which some argue is the defining characteristic of mixed method research (Tashakorri and Creswell, 2007).

If a mixed methods research strategy is employed this generally implies that there are a number of research questions to address about a substantive issue. MMR is also justified in terms of its capacity to address *different aspects* of a research question. This in turn leads the researcher to consider how to frame their research questions and how these determine the methods chosen. Typically research questions are formulated in the research proposal. However, they should also be amenable to adaptation (Harrits, 2011 citing Dewey, 1991); adaptations may be necessary as researchers respond to the actual conditions of the inquiry. According to Law (2004), research is an ‘assemblage’, that is something not fixed in shape and incorporating tacit knowledge, research skills, resources and political agenda that are ‘constructed’ as they are woven together (p. 42). Methodology should be rebuilt during the research process in a way that responds to research needs and the conditions encountered – what Seltzer-Kelly et al. term ‘a constructivist stance at the methodological level’ (Seltzer-Kelly et al., 2012 p. 270). This can also happen at the phase when data are analyzed.

Developing a coherent methodology with a close link between the research question and the research strategy holds out the best hope for answering a project’s objectives and questions (Woolley, 2009, p. 8). Thus Yin would say that to carry out an MMR analysis it is essential to have an integrated set of research questions (Yin, 2006). However, it is not easy to determine what constitutes coherence. For example, the research question concerning the link between the quality of children’s diet in the general population and whether mothers are in paid employment may be considered a very different and not necessarily complementary question to the research

question about the conditions under which the children of working mothers are fed. Thus we have to consider here how tightly or loosely the research questions interconnect.

The framing of the research question influences the method chosen that, in turn, influences the choice of analytic method. Thus in a study of children's food that examined the link between children's diet and maternal employment we examined a number of large scale data sets and carried out statistical analyzes on these, while in studying the conditions under which children in working families get fed, we carried out qualitative case analysis on a subset of households selected from one of the large scale data sets.

THE CONTEXT OF JUSTIFICATION: THE ANALYSIS PHASE

In the analysis phase of MMR the framing of the research questions becomes critical affecting when, to what extent and in what ways data from different methods are integrated. So, for example, we have to consider the temporal ordering of methods. For example, quantitative data on a research topic may be available and the results already analyzed. This analysis may influence the questions to be posed in the qualitative phase of inquiry.

Thus it is also necessary to consider the compatibility between the units of analysis in the quantitative phase and the qualitative phase of the study; for example, between variables studied in a survey and the analytic units studied in a qualitative study. Are we seeking analytic units which are equivalent (but not similar) or are we seeking to analyze a different aspect of a social phenomenon? If the latter, how do the two analyses relate? This may become more critical if the same population is covered in both the qualitative and quantitative phases. Thus, what happens when a nested or integrated sampling strategy is employed, as in the case of a large-scale survey analysis and a qualitative analysis based on a subsample of the survey?

There have been a number of frameworks suggested for integrating data produced by quantitative and qualitative methods (Greene et al., 1989; Brannen, 1992; Caracelli and Greene, 1993). While these may provide a guide to the variety of ways to integrate data, they should not be used as fixed templates. Indeed, they may provide a basis for reflection after the analysis has been done.

(1) *Corroboration* – in which one set of results based on one method are confirmed by those gained through the application of another method.

(1) *Elaboration or expansion* – in which qualitative data analysis may exemplify how patterns based on quantitative data analysis apply in particular cases. Here the use of one type of data analysis adds to the understanding gained by another.

(2) *Initiation* – in which the use of a first method sparks new hypotheses or research questions that can be pursued using a different method.

(3) *Complementarity* – in which qualitative and quantitative results are regarded as different beasts but are meshed together so that each data analysis enhances the other (Mason, 2006).

Together the data analyses from the two methods are juxtaposed and generate complementary insights that together create a bigger picture.

(4) *Contradiction* – in which qualitative data and quantitative findings conflict. Exploring contradictions between different types of data assumed to reflect the same phenomenon may lead to an interrogation of the methods and to discounting of one method in favor of another (in terms of assessments of validity or reliability). Alternatively, the researcher may simply juxtapose the contradictions for others to explore in further research. More commonly one type of data may be presented and assumed to be ‘better’ rather than seeking to explain the contradictions in relation to some ontological reality (Greene et al., 1989; Denzin and Lincoln, 2005).

As Hammersley (2005) points out, all these ways of combining different data analyses to some extent make assumptions that there is some reality out there to be captured, despite the caveats expressed about how each method constructs the data differently. Thus, just as seeking to corroborate data may not lead us down the path of ‘validation,’ so too the complementarity rationale for mixing methods may not complete the picture either. There may be no meeting point between epistemological positions. As Hammersley suggests, there is a need for a dialogue between them in the recognition that absolute certainty is never justified and that ‘we must treat knowledge claims as equally doubtful or that we should judge them on grounds other than their likely truth’ (Hammersley, 2008, p51).

MMR ANALYSIS STRATEGIES: EXAMPLES OF STUDIES

Caracelli and Greene (1993) suggest analysis strategies for integrating qualitative and quantitative data. In practice these strategies are not always standalone but blur into each other. Moreover, as Bryman (2008) has observed, it is relatively rare for mixed method researchers to give full rationales for MMR designs. They can involve data transformation in which, for example, qualitative data are treated quantitatively. They may involve typology development in which cases are categorized in patterns and outlier cases are scrutinized. They may involve data merging in which both data sets are treated in similar ways, for instance, by creating similar variables or equivalent units of analysis across data sets. In this section, drawing on the categorization of Caracelli and Greene (1993), we give some example of studies in which qualitative and quantitative data are integrated in these different ways (Table 1). These are not intended to be exhaustive nor are the studies pure examples of these strategies.

(1) Qualitative data are transformed into quantitative data or vice versa

In survey research, in order to test how respondents understand questions it is commonplace to transform qualitative data into quantitative data. This is termed cognitive testing. The aim here is to find a fit between responses given in both the survey and in the qualitative testing. For example, most personality scales are based on prior clinical research. An example of data transformation on a larger scale is taken from a program of research on the wider benefits of adult learning (Hammond, 2005). The rationale for the study was that the research area was under-researched and that the research questions relatively unformulated (p. 241). The aim was to carry out qualitative research to identify variables to test on an existing national longitudinal data set. The qualitative phase involved biographical interviews with adult learners. The quantitative data consisted of data from an existing UK cohort study (the 1958 National Child Development Study – NCDS). A main justification for using these latter data concerned the further exploitation of what are expensive data to collect. The qualitative component was conceived as a ‘mapping’ exercise carried out to inform the research design and the implementation of the quantitative phase, that is the identification of variables for quantitative analysis (Hammond, 2005, p. 243). This approach has parallels with qualitative pilot work carried out as a prologue to a survey, although the qualitative material was also analyzed in its own right. Moreover, while suggesting that the qualitative data were used to identify appropriate variables to examine in the quantitative part of the research project, Hammond also insists that that the qualitative data should *not* be used to explain quantitatively-derived outcomes but to interrogate them further (Hammond, 2005, p. 244).

However, while qualitative data were used with the aim of finding common measures that fitted with the quantitative inquiry, contradictions between the respective findings arose. For example, Hammond reports that the effect of adult learning on life satisfaction (the transformed

measure) found in the NCDS cohort analysis was greater for men than for women while women reported themselves in the biographical interview responses to be positive about the courses they had taken. On this issue, the biographical interviews were regarded as being ‘more sensitive’ than the quantitative measure. Hammond also suggests that the interview data showed that an improved sense of well being (another transformed measure) experienced by the respondents in the present was not necessarily incompatible with having a negative view of the future. The quantitative data conflated satisfaction with ‘life so far’ and with ‘life in the future’. (See Brannen and Nilsen, 2007 for a similar critique of quantitative data concerning planning and perspectives on time). Similarly, another finding from the cohort study suggesting marginal benefits to individuals of taking several adult education courses was modified by the earlier qualitative evidence: that taking courses may act as a replacement activity for those who lacked informal support networks, thus balancing out the additional beneficial effects of courses.

Contradictions were also explained in terms of the lack of representativeness of the qualitative study (the samples did not overlap). In addition, it is possible that priority was given by the researcher to the biographical interviews who may have preferred or placed more trust in this approach (although the latter is not explicitly stated). In any event the biographical interviews were conducted *before* the quantitative analyses and were used to shape the decisions about which analyses to focus on in the quantitative analysis. Hence the qualitative data threw up hypotheses so that the quantitative data were rejected or supported. Another relevant factor in explaining contradictions was that the researcher in question had no stake in creating or shaping the quantitative data set. Indeed, while the research design was shaped by the pre-existence of this cohort study, there was no protocol suggesting the ways in which it might be useful to pursue this line of research. However, what is interesting about the use of qualitative work to test

on quantitative evidence is the rationale given: namely the way mixed method strategy allows researchers to pose or initiate new lines of questioning (Greene, Caracelli and Graham, 1989) – a result not necessarily anticipated at the outset of the research.

(2) Deepening the analysis: Typologies, extreme or outlier cases are subjected to further scrutiny either at a later time point or in another data set

A longitudinal or a multi-layered design provides researchers with opportunities to examine the strength of the conclusions that can be drawn about the cases and the phenomena under study. For an example of this strategy, we turn to the classic study carried by the Gluecks (Glueck and Glueck 1950, 1968).

The study *Five Hundred Criminal Careers* was based on longitudinal research of delinquents and non-delinquents that began in 1949 and continued to 1965. The Gluecks studied the two groups at three age points; 14, 25, and 32. The study had a remarkably high (92%) response rate when adjusted for mortality at the third wave. The Gluecks collected very rich data on a variety of dimensions of juvenile and adult development including major life course events. Their approach to qualitative research was to embed open-ended questions within a survey framework. They carried out interviews with the respondents and their families, but also with key informants (social workers, school teachers, employers, and neighbors for example). They also carried out home observations and examined official records and criminal histories.

Some decades later, Laub and Sampson (1993, 1998) reanalyzed the rich data created by the Gluecks' in a longitudinal way; the Gluecks had originally analyzed the data cross sectionally. Laub and Sampson (1998) note that the Gluecks' material "represent the comparison, reconciliation and integration of these multiple sources of data" (p. 217) although the Gluecks

made no attempt to treat the qualitative data in their own right. From a methodological and epistemological viewpoint, the study was firmly grounded in a quantitative logic where the purpose was to arrive at *causal explanations* and *the ability to predict criminal behavior*.

It is significant that the Gluecks were carrying out their research in a pre-computer age. Their coding was therefore less atomized than it would have been today and hence it facilitated a reanalysis of the material. When Laub and Sampson (1998) came to recode the raw data many years later, they rebuilt the Gluecks' original data set but also used the Gluecks' coding schemes to validate the Gluecks' original analyzes. Laub and Sampson then constructed the criminal histories of the sample using the data in a longitudinal way and drawing on and integrating different kinds of data that were available. This involved merging the data.

Next, they selected a subset of these cases for intensive qualitative analysis. They chose the cases purposively in order to explore consistencies and inconsistencies between the original findings and the original study's predictions for the delinquents' future criminal careers - what happened to them some decades later. They examined 'off diagonal' and 'negative cases' that did not fit the quantitative results and predictions. In particular, they selected individuals who on the basis of their earlier careers were expected (according to the Gluecks' original analysis) to follow a life of crime but did not, and those expected to cease criminality but did not.

Citing Jick (1979), Laub and Sampson (1998) suggest how divergence can also turn out to be an opportunity for enriching explanations (p. 223). They argued that the strategy of examining outliers or deviant cases on the basis of one data analysis and interrogating these in a second data analysis was beneficial in two ways. First, it enhanced the original quantitative data analysis and demonstrated the complex processes that take place over long periods of the life course and in pathways into and out of crime. Second, through examining residual or 'negative

cases' that did not fit the quantitative results and predictions, it led them to examine 'unidentified pathways' into and out of crime that took place over long time periods (Laub and Sampson, 1998, p. 222). They argued that "without qualitative data, discussions of continuity often mask complex and rich qualitative processes" (Sampson and Laub, 1997 quoted in Laub and Sampson 1998, p. 229). Moreover, they also made a crucial claim for a biographical approach; that it enables the researcher to interpret data in relation to the historical context, in this case to understand criminality in relation to the type and level of crime prevalent at the time.

Some fifty years later, Laub and Sampson (1998) selected a further sub sample of the original sample of delinquents, having managed to trace them through a variety of official sources (Laub and Sampson, 1993). It is noteworthy that, at the time of writing (the project was ongoing), they were using a life history/story approach in which they asked the original respondents in this study to review and interpret their past lives. The researchers were particularly interested in identifying the turning points and thus to understand what had shaped the often unexpected discontinuities and continuities in the careers of these one-time delinquents.

This study is therefore a good exemplar of the analytic strategy of subjecting typologies to deeper scrutiny, in the sense that its design was longitudinal and that it collected a variety of types of data which were subjected to secondary analysis many years later by new researchers. In addition, it afforded these same researchers the opportunity to theorize about the conditions concerning cases that deviated from predicted trajectories. However, such opportunities are rarely taken advantage of by researchers, while it is often difficult to trace former respondents for practical and ethical reasons.

(3) Data merging - the same set of variables is created across quantitative and qualitative data sets

Here assumptions are made that the phenomena under study are similar in both the qualitative and quantitative parts of an inquiry so that the same set of variables is used in both. This strategy is exemplified in the following two studies. As well as in terms of the research foci and concepts employed, the treatment of the data in both parts of the study was seamless. This strategy blurs into the first strategy because it involves transforming data. In a longitudinal study Blatchford (2005) examined the relationship between classroom size and pupils' educational achievement. The quantitative sample consisted of 10,000 children from a random selection of English schools. Blatchford justifies using a mixed method strategy in terms of the power of mixed methods to reconciling inconsistencies found in previous research, but he does not address the issue further. He argues that quantitative information was necessary to examine statistical associations between class size and pupils' educational achievement. (The project also collected data on adult-pupil ratios and teacher time etc.) The rationale given for using qualitative methods was the need to assess the relationships between the same variables but in particular case studies.

Referring to the analysis phase, Blatchford notes that "priorities had to be set and some areas of investigation received more attention than others." (2005, p. 204). In this study, the quantitative analysis concerning the statistical association between class size and educational achievement dominated. Blatchford comments that this occurred despite the researchers having collected "fine grained data on classroom processes" that could have lent themselves to other kinds of analysis, such as analysis that deals with understanding how students learn in different classroom environments. The qualitative data were in fact put to limited use. Instead they were largely treated quantitatively. In effect the qualitative data were merged with quantitative data.

Sammons et al. (2005) similarly employed a longitudinal quantitative design to explore the effects of pre-school education on children's attainment and development at entry to school

(the sample was drawn from six English local authorities and six types of pre-school provision). Using a purposive rationale, they selected a smaller number of early education centers from their original sample on the basis of their contrasting profiles. Sammons et al. (2005) coded the qualitative data in such a way that the “reduced data” (p. 219) were used to provide statistical explanations for the outcomes produced in the quantitative longitudinal study. Thus again the insights derived from the qualitative data analysis were merged with the quantitative variables, which were correlated with outcome variables on children’s attainment.

In this latter case, it seems that qualitative data were used to support the original quantitative results. In this study, the fieldworkers doing the qualitative case studies sought to ‘protect’ themselves from knowledge of the quantitative results in order to avoid bias. This suggests that the study in question while using qualitative methods was underpinned by a set of philosophical assumptions typically associated with positivism concerning bias and neutrality. The researchers in question could have drawn on both the qualitative and quantitative data for different insights, as is required in case study research (Yin, 2006) and as suggested in their purposive choice of pre-school centers.

TABLE 1 MMR ANALYSIS STRATEGIES: EXAMPLES

Analytical strategy	Summary	Example(s)	Why/how useful
Data transformation	Qualitative data are transformed into quantitative data or vice versa	Hammond, 2005	e.g. to identify variables for quantitative analysis and interrogate quantitative outcomes
Deepening of the analysis via case selection and typologies	Typologies, extreme or outlier cases are subjected to scrutiny either at a later time point or in another data set	Glueck and Glueck 1950, 1968	e.g. to enrich interpretation and further explanation
Data merging	The same set of variables is created across quantitative and qualitative data sets	Blatchford, 2005 Sammons et al., 2005	e.g. to make consistent comparisons across data sets

USING QUANTITATIVE AND QUALITATIVE DATA: A LONGITUDINAL STUDY OF WORKING FAMILIES AND FOOD

In this final part of the chapter we take an example from our own work in which we faced a number of methodological issues in integrating and meshing different types of data. In this section we discuss some of the challenges involved in collection and analysis of such data.

The study we carried out is an example where its quantitative and qualitative constituent parts were designed to address differently framed questions. Its questions were, and remain, currently highly topical in the western world and concern the influences of health policy on

healthy eating, including in childhood, and its implications for obesity.¹ Much of the health evidence is unable to explain why it is that families appear to ignore advice and continue to eat in unhealthy ways. The project arose in the context of some existing research which suggests an association between parental (maternal) employment and children's (poor) diet (Hawkins et al., 2009). We pursued these issues by framing the research phenomenon in different ways and through the analysis of different data sets.

The project was initiated in a policy context in which we tendered successfully for a project that enabled us to exploit a data set commissioned by government to examine the nation's diet. Somewhat of a landmark study in the UK, the project is directly linked to the National Diet and Nutrition Survey (NDNS) funded by the UK's Food Standards Agency (FSA) and Department of Health (DH), a study largely designed by those from public health and nutritionist perspectives. These data, from the first wave of the new rolling survey, were unavailable to others at that time. We were also facilitated in selecting a subsample of households with children from the NDNS that we subjected to a range of qualitative methods. The research team worked closely with the UK government to gain access to the data collected and managed by an independent research agency, in the identification of a subsample to meet the research criteria and in seeking the consent of the survey subsample participants.

Applying anthropological and sociological lenses, the ethnographically trained researchers in the team sought to *explore inductively* parents' experiences of negotiating the demands of 'work' and 'home' and domestic food provisioning in families. We therefore sought to understand the contextual and embodied meanings of food practices and their situatedness in

¹ The study titled Food Practices and Employed Families with Younger Children is funded as part of a special initiative funded by the UK's Economic and Social Research Council and the UK's Food Standards Agency (now with the Department of Health). The current research team includes Charlie Owen and Antonia Simon (statisticians and secondary data analysts), the Principal Investigator Dr Rebecca O'Connell (anthropologist) and, Professor Julia Brannen (sociologist). Katie Hollinghurst and Ann Mooney were formerly part of the team (psychologist).

different social contexts (inside and outside the home). We also assumed that children are agents in their own lives, and therefore we included children in the study and examined the ways in which children reported food practices and attributed meaning to food. The main research questions for the study were:

- (1) What is the relationship between parental employment and the diets of children (aged 1.5 to 10 years)?
- (2) How does food fit into working family life and how do parents experience the demands of 'work' and 'home' in managing food provisioning?
- (3) How do parents and children negotiate food practices?
- (4) What foods do children of working parents eat in different contexts – home, childcare and school - and how do children negotiate food practices?

The study not only employed a MMR strategy it was also longitudinal, a design that is rarely discussed in the MMR literature. We conducted a follow up study (Wave 2) approximately two years later, which repeated some questions and additionally asked about social change, the division of food work, and the social practice of family meals. The first research question was to be addressed through the survey data while questions 2, 3, and 4 were addressed through the qualitative study. In the qualitative study, a variety of ethnographic methods were to be deployed with both parents and children aged 2 to 10 years. The ethnographic methods included a range of interactive research tools which were used flexibly with the children since their age span is wide: interviews, drawing methods, and, with some children, photo elicitation interviews in which children photographed foods and meals consumed within and outside the home and discussed these with the researcher at a later visit. Semi-structured interviews were carried out with parents

who defined themselves as the main food providers and sometimes with an additional parent or care-provider who was involved in food work and also wished to participate.

In the context of existing research that suggests an association between parental (maternal) employment and household income with children's (poor) diet (Hawkins et al., 2009) carried out on a different UK data set and also supported by some US research (e.g. Crepinsek and Burstein, 2004; McIntosh et al., 2008), it was important to investigate whether this association was born out elsewhere. In addition and in parallel, we therefore carried out secondary analysis on the NDNS Year 1 (2008/2009) data and on two other large scale national surveys, the Health Survey for England (HSE 2007, 2008) and the Avon Longitudinal Study of Parents and Children, (ALSPAC, otherwise known as 'Children of the Nineties') to examine the first research question (above). This part of the work was not straightforward. In the first place we found that, contrary to a previous NDNS (1997) survey that we had looked at that had classified mothers' working hours as full or part time, neither mothers' hours of work nor full/part time status had been collected in the new rolling NDNS survey. Rather, this information was limited in most cases to whether a mother was or was not in paid employment. Thus it was not possible to disentangle the effects of mothers working fulltime from those doing part-time hours on children's diets. This was unfortunate since the NDNS provided very detailed data on children's nutrition based on food diaries, unlike the Millennium Cohort Study (MCS), which only collected mothers' reports of children's snacking between meals at home (Hawkins et al., 2009). Whilst the MCS analysis had found a relationship between long hours of maternal employment and children's dietary intake, no association between mothers' employment and children's dietary intake was found in the NDNS (Simon et al., forthcoming; O'Connell et al.,

2011). However, it is possible that a relationship might have been found if we had been able to disaggregate women's employment by hours.

In the following we describe three instances of data analysis in this longitudinal MMR study in relation to some of the key analytic issues set out in the research questions described above (see Table 2).

- (1) Studying children's diets in a MMR design
- (2) Examining the division of household food work in a MMR design
- (3) Making sense of family meals in a MMR design

TABLE 2 MMR ANALYSES IN WORKING FAMILIES AND FOOD STUDY

Research questions	Data sets	Integration or not of analyses
(1) What is the link/association between parental employment and children's diet?	-NDNS national survey HSE national survey -ALSPAC (Regional survey) -Qualitative sub sample of NDNS (2 time points)	Lack of integration e.g. - Different measures and concepts across data sets - Diets of children may have changed by time of interview as children older
(2) How do households organize the division of food work and how is this influenced by parental employment?	-NDNS -US (National Panel Study) -Qualitative sub sample of NDNS (2 time points)	Convergent analysis as similar focus on behavior PLUS Qualitative data provide outlier cases (compared with survey results) to further scrutiny
(3) What is the relationship between family meals and parental employment?	-NDNS data taken from diaries (who present when children eating) -US (National Panel Study) (Self report of meal frequency) -Qualitative sub sample of NDNS (patterns of eating together in working week)	Lack of integration e.g. -NDNS measured who present when child eating and missing data on working hours -US self report of frequency of 'family meal' (assumes one shared meaning)

	(2 time points)	- NDNS qualitative study asked about patterns of eating together in working week
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(1) Linking data in a longitudinal MMR design: studying children's diets

The research problem

Together with drawing a sample for qualitative study from the national survey, we aimed to carry out secondary analysis on the NDNS data in order to generate patterns of 'what' is eaten by children and parents and to explore associations with a range of independent variables, notably mothers' employment. The NDNS diet data were based on four day un-weighed food diaries which recorded detailed information about quantities of foods and drinks consumed as well as where, when, and with whom foods were eaten (Bates et al., 2011). On behalf of the NDNS survey, the diaries were subjected by researchers at Human Nutrition Research (HNR), Cambridge University, to an analysis of nutrient intakes using specialist dietary recording and analysis software (DINO - Data In Nutrients Out) (Bates et al., 2011).

Methodological challenges

These nutritional data proved challenging for us as social scientists to use, and they involved discussion with nutrition experts from within and outside HNR who created different dietary measures for the use of the team in the secondary analysis, thereby involving some interesting cross-disciplinary discussion. Working with nutritionists, we developed a unique diet quality index which compared intakes for children in different age ranges to national guidelines, giving an overall diet 'score;' a composite measure which could be used to sample children from the survey and also as an outcome measure in the regression analysis described above, which set out to answer the first research question on the relationship between maternal employment and

children's dietary intakes (Simon et al., 2012). Whilst the usefulness of the diet data was constrained by the fact that no data had been collected about mothers' working hours (nor indeed maternal education, an important cofounder), an important impact of our study has been to have these added to the annual survey from 2015 to increase the study's usefulness to social science and indeed social policy.

As noted another aim of using the national survey data set, the NDNS, was to help us draw a purposive subsample of children (N=48) in which cases of children with healthier and less healthy diets were equally represented (as well as to select the sample on demographic variables). However, a challenge that we encountered was that because of the small number of children in the age range in which we were interested we had to include a wider age range of children (1.5-10 years) than would have been ideal.

We also sought to link use the quantitative diary data from NDNS with the ethnographic and interview data from parents and children concerning their reported food practices. However, whilst the NDNS dietary data and the diary method used are considered the 'gold standard' in dietary surveys (Stephen, 2007) they were less useful for us at the level of the qualitative sample and in practice this proved not to be feasible. For one, the scores were based on dietary data collected over a single brief period of time (4 days) (Bates et al., 2011). At the aggregate level, because the whole survey was conducted over an extended time period (one year), with a mixture of weekdays and weekend days surveyed, this was unproblematic. However, at the individual level, it was clear that these four days were not generalizable to dietary intakes over a longer time period. One parent in the qualitative study, for example, said the diary had been collected over a weekend break in Scotland where the family had indulged in holiday eating including plenty of chips. In addition, since the data we had was about nutrient intakes - we did not have

the resources (time or expertise) to examine the raw diary data, which could potentially have been provided - we had no idea of what children were actually eating. Furthermore, there was a time lag between when the diet data were collected and when we did the fieldwork for the qualitative study (around 6 months later). We could have waited for all the NDNS data to be cleaned and analyzed, which would have given us additional information about children's food intakes (for example, their consumption of fruit and vegetables), but this would have caused a far greater time delay in starting the qualitative study. Given the rapidity with which children in the younger age range change their preferences and habits, the diet data would then have been 'out of date' by the time we conducted qualitative interviews. Our decision to construct a diet quality index was therefore a pragmatic one, largely determined in practice by the data available to us within a reasonable time from the diary data collection - those provided as feedback to the study participants after the NDNS visits².

As we were also interested in the foods children were eating, we asked parents and children in the qualitative interviews to describe what they ate on the last weekday and on the last weekend day and typicality, rather than repeating the diet diaries which would have been highly resource intensive. Mothers were also asked to assess their children's diets. We could not compare mothers' descriptions and assessments of their child's diet with diaries since we did not have access to the latter. However, in comparing these assessments with the child's NDNS diet score there appeared in some cases to be corroboration whilst others appeared to bear no relation. Indeed some of the apparently 'worst' cases, according to mothers' assessments, did not necessarily have scores suggesting poor diets. Although hours of employment were asked in the

² A 'Dietary Feedback' report is provided to each individual participant about his or her own intake within three months of the diet diary being completed. This provides information about the individual intakes of fat, saturated fat, Non-Milk Extrinsic Sugars (NMES), dietary fibre (as non-starch polysaccharide (NSP)), Vitamin C, folate, calcium, iron and energy (Table 1) relative to average intakes for each of these items for children in the UK, these being based on the results for children of this age from the NDNS conducted in the 1990s (Gregory et al 1995; 2000).

qualitative study, no patterns were found in these data between hours of employment or other characteristics such as social class³. In analyzing other research questions, about patterns of family meals and child versus adult control for example, diet scores did not generally appear to be related to patterns found in the qualitative data. This may have been explained by the small sample or by lack of validity of the diet data at the individual level or by changes in children's diet between the survey and qualitative study. In a follow up qualitative study we are conducting with families two years later we will be able to compare analyses over two time points using the same questions put to parents and children about children's food and eating.

In terms of linking dietary data in a MMR design, the NDNS survey data suffered from a number of limitations. Even setting aside our particular epistemological assumptions, theoretical interests and research objectives which were different from those of the survey, these affected the integration of the data. The usefulness of the NDNS data for addressing the research questions at the aggregate and individual level was questionable, notably the lack of data on the working hours of mothers and the difficulties of accessing detailed diary data collected at one time point as an individual measure of nutrition. The NDNS had rather small numbers of the groups in which we were interested, that compounded the selection of the qualitative subsample. There were issues concerning the employment of different methods at different time points; this was especially challenging methodologically given the focus on younger children's food tastes and diets that can change dramatically within a short period of time. A further issue concerned conceptualization across different data sets, in particular relating to issues around food practices such as healthy eating. As noted, in the case of the survey data composite, measures of children's

³ However at the aggregate level, secondary analysis of the National Diet and Nutrition Survey (NDNS) for 2008-2010 (National Centre for Social Research et al., 2012), a combined dataset of respondents from Year one (2008-2009) and Year two (2009-2010), found that social class and household income were related to children's fruit and vegetable consumption and overall diet quality (as measured by our nutritional score) (Simon et al., forthcoming).

nutrient intake at a particular moment in time were created using food diary data, and the measurements were then compared to national guidelines. In contrast, in the qualitative study, latitude was given to parents to make their own judgments about their child's diet from their perspectives while we were able to compare what parents reported at two time points and so take a longer term view of it. Therefore in integrating and interpreting both sets of data, we wrestled with the epistemological and ontological assumptions which underpinned the study's main research questions concerning the meaning and significance of food and our own expectations about the kinds of 'essential' socio-demographic data that we would expect any survey to collect.

Nonetheless we had to overcome these tensions and to demonstrate the societal impact of research that focused on an emotive and politically sensitive topic - maternal employment and diets of young children. In practice the study's outputs remained divided by approach, with papers drawing on mainly qualitative (Brannen et al., 2013; O'Connell et al., 2013; Knight et al., forthcoming) or quantitative (Simon et al., forthcoming) findings or describing methodological approaches (e.g. Simon et al., 2012; O'Connell, 2012; Brannen and Moss, 2012).

(2) Similar units of analysis in a MMR longitudinal design: examining the division of household food work

The research problem

Mothers' employment is only one small part of the picture of how food and work play out in households in which there are children. UK evidence exists suggesting that men are more likely to cook regularly and share responsibility for feeding the family when women are absent, usually because of paid employment. However, this research was conducted some time ago (e.g. Warde and Hetherington, 1994; England and Farkas, 1986).

The analysis

The more recent evidence that we analyzed is from the NDNS and the 40,000 UK Household Panel study called Understanding Society. The NDNS (Year 1: 2008/9) survey findings suggest that mothers are the ‘main food providers’ in 93 per cent of families with a child 18 months -10 years, with no significant differences according to work status or social class. Data from Understanding Society (Wave 2: 2010/2011) provide data on parental hours of work (10,236 couples with a child aged 0 - 14 years). Our secondary analysis of these data suggests that mothers working part time are significantly less likely to share cooking with their partners, compared with mothers working full time (but not those working 48 or more per week⁴). Complementing this, the secondary analysis also found that, in general, the longer the hours worked by a father, the less likely he was to share cooking with his spouse or partner.

In the qualitative study we asked questions (mainly to mothers) about who took charge of the food work, including cooking and food shopping. At the follow-up study (Wave 2) we asked about whether this was the same, had changed, whether children were encouraged to do more as they got older, and how the participants felt about how food work was shared. In their responses, the participants, usually mothers, mentioned other aspects of food work such as planning for meals, washing up, and loading the dishwasher. In classifying the cases, we drew on DeVault’s (1991) concept of ‘domestic food provisioning’ and did not limit food work to cooking but also included shopping, clearing up, and less visible aspects such as meal planning and feeling ‘responsible’ for children’s diets. (At Wave 2 we asked a question about which parent worried more about the target child’s diet, thus eliciting responses about ‘responsibility’.)

The methodological challenges

⁴ A feasible explanation for this finding is that mothers working these long hours are more likely to use paid or unpaid childcare in addition to sharing with a partner or spouse.

Intrinsic to the way we approached the qualitative analysis was the treatment of households as cases. We plotted the households according to the level of fathers' involvement in food provisioning on a continuum. This resulted in a more refined analysis compared with the quantitative data analysis (in the UK panel study Understanding Society). It enabled us to identify features of family life, not only mothers' and fathers' working hours – albeit these were mentioned most often – which were important in explaining the domestic division of food work (Metcalf et al., 2009, p. 109-111). Moreover, because we investigated the division of food work over time (two years), we were also able to explore continuities and discontinuities at the household level. Parents accounted for changes in the division of food work accordingly: a mother becoming ill, moving house, the birth of an additional child, loss of energy, children being older and easier to cook for, the loss of other help, and health concerns. We found, therefore, that patterns within households do change, with some fathers doing more food work and some doing less in response to circumstances in their lives (within and beyond the household), albeit only a minority do equal amounts or more. The conceptual approach that was adopted included a focus on routine practices and on accounting for practices to help shift the gaze away from a narrow behavioral 'working hours perspective' towards understanding how family (food) practices are influenced by the interpenetration of public and private spheres (home and workplace) and how people make sense of (and thus reproduce or redefine) patterns of paid and unpaid work. Food practices, like other family practices, are shaped by gendered cultural expectations about motherhood and fatherhood - what it means to be 'a good mother' and 'a good father' – as well as by material constraints of working hours.

As well as providing a more refined analysis than the quantitative data, the qualitative data also provided a way of examining outliers or cases that did not fit the general pattern shown

in the survey results (according to Caracelli/Green's categories described above). Although the general trend was for a man to share cooking more when his spouse worked longer hours and to do less sharing when he worked longer hours, the qualitative data provided examples of where this did not fit (as well as where it did). For example, in one case, a father worked fewer hours than his wife but did almost no food work as he was said by his wife to lack competence, whilst another father who worked longer hours took most responsibility for food work as this fitted with his and his wife's shift patterns.

In addressing the research question of how parental employment influences the division of food work, the use of both the survey data and the qualitative material together proved relatively successful since the unit of analysis in both referred to behavior. To some extent the MMR approach provided corroborating evidence while the qualitative material refined and elaborated on the quantitative analysis. Broadly the results were comparable and complementary albeit that the research questions relating to each method were somewhat different; notably in the qualitative study, there was a concern to understand the respondents' accounts for the division of food work and to examine food work in the context of the families more holistically and the meaning of mothering and fathering more generally. By contrast in the survey, food work was conceptualized behaviorally and broken down into constituent 'tasks' such as cooking (cf. DeVault, 1991).

(3) Concepts and meaning in a MMR longitudinal design: the study of family meals

The research problem

Studies have identified an association between frequency of 'family meals' and children's and adolescents' Body Mass Index (BMI), nutritional status, social wellbeing and

physical and mental health. These studies suggest that children who eat fewer family meals have poorer health, nutrition and behavioral outcomes than those who eat more meals with their families (e.g. Neumark-Stzainer et al., 2003). Some longitudinal research implies causality rather than mere association; that family meals are ‘protective’ against a range of less optimal nutritional and psychosocial outcomes, especially for girls (e.g. Neumark-Sztainer et al., 2008). There is widespread agreement about the reduced frequency of eating dinner as a family as children age (e.g. Gilman et al., 2003, p. 22). Some studies also find an association with socio-economic status and mothers’ paid employment (e.g. Neumark-Stzainer et al., 2003). In Wave 1 of the study we were concerned to examine via the qualitative dataset the relationship between children’s participation in family meals and their parents’ employment to establish whether maternal employment seemed important in explaining the social dimension of children’s eating practices (in this case meals). We asked about eating patterns on the previous work and non-work day and their typicality. We also asked about presence of different family members on different days of the week.

The analysis

These questions enabled us to develop a typology of eating patterns in the working week; eating together most days, the modified family meal in which children ate with one parent and a third situation in which eating together never occurred. In addition we asked what participants understood by the term ‘family meal’ and whether family meals were important to them. Most people suggested that family meals were important, but fewer managed to eat them on most working days. We drew upon the concept of synchronicity to shed light on how meals and meal times were coordinated in family life and the facilitators and constraints upon coordination (Brannen, O’Connell and Mooney, 2013). We found that whether families ate together during the

week, at the weekend only, or more rarely was not only influenced by parents' work time schedules, but also by children's timetables relating to their age and bodily tempos, their childcare regimes, their extra-curricular activities, and the problem of coordinating different food preferences and tastes. Whilst we did not report it, as the numbers were small, there was very little difference between the average diet score of children in each group (meals, no meals, and modified meals), which, as explained above, is perhaps to be expected given that the differences within each group meant there were many factors involved.

At Wave 2, we aimed to extend this analysis by examining quantitatively the relationship between children eating 'family meals' and socio-demographic variables (e.g. child age, maternal employment, social class) and nutritional intake at the aggregate level. To do so we aimed to explore a unique aspect of the archived NDNS dataset which has currently only been analyzed in one other study (Mak et al., 2012). These data are 'contextual' in relation to the food and nutrition data in that participants were asked as part of the food diaries to record, in relation to each eating occasion, not only what was eaten, but also the time of eating, where, with whom, and whether the television was on (Bates et al., 2011).

The methodological challenges

The main advantage of using these data was that, in contrast to dietary surveys which include a measure of 'family meal frequency', and take the meaning of family meal for granted, these data were not collected by retrospective self-reports. Given the normative status of 'the family meal,' as set out in the sociological literature (e.g. Murcott, 1997, 2010; Jackson et al., 2009) and our own qualitative study (Wave 1), we thought that these data were advantageous.⁵ In

⁵ They avoid two key problems associated with self report of family meals in the extant literature in which 'family meals' are not usually defined by interviewers but by interviewees themselves (cf. Hammons and Fiese, 2011): that people will answer the same response but mean different things and, additionally, also because of the normativity surrounding family meals some participants may over report their participation in them. In short, such data seemed

addition, since the NDNS contains information about overall dietary intake, we could link family meal frequency to diet quality using our score. However, there were also disadvantages, namely that the socio-demographic data (especially maternal education and hours of employment) had not been collected. There were also other methodological challenges for the team, specifically in designing an operationalizable definition of a ‘family meal.’ In short, we had to define ‘what is a meal’ and ‘what is a family’ in relation to the data available. This was limited by the following factors among others. First, in relation to the variable ‘Who eaten with,’ we found little within-group variation in that most children were not reported as eating alone. Whilst we thought it feasible to create a dichotomous variable – family/not family – decisions about how to do this were tricky given the data had been coded into categories which were not mutually exclusive (‘alone,’ ‘family,’ ‘friend’s,’ ‘parent(s)/care-provider,’ ‘siblings,’ ‘parent(s)/care-provider & siblings,’ ‘care-provider & other children,’ ‘other’). Second, the number of possible eating occasions throughout the day was considerable, involving consideration of which ‘time slot’ to examine for a possible ‘family meal.’ We opted to look at the family evening meal, as this is implied if not explicitly spelled out in popular understanding and in research about family meals and, furthermore, we had established that 5pm-8pm was the most common time slot for children’s eating in the NDNS data. However, we were aware that this might exclude some younger children who might eat earlier.

Other problems not limited to this dataset were that we could not know from these data whether those present were actually eating with the child or whether they were eating the same foods (both of which are thought to be potentially important in explaining any association

advantageous compared to poorly designed survey questions that are associated with known problems to do with reliability, validity and bias (e.g. c.f. Hammons and Fiese, 2011).

between family meal frequency and children's and adolescents' overall dietary intakes e.g. CRFR, 2012; Skafida, 2013).

In operationalizing 'family meals' in the NDNS dataset, we therefore recognized that we had moved away somewhat from the idea of a 'family meal' as held by most people. Whilst we were avoiding the problem of asking participants to define this themselves, we were creating new problems in that any conclusions would not relate to family meals as they are popularly understood but would rather relate to very particular practices – a child eating between 5 and 8pm with an adult member of his or her family present (or not).

Thus in examining the topic of family meals via a MMR design, we sought via the qualitative data to explore similar issues to those examined in the quantitative data namely to determine the frequency of parental presence and child presence at family mealtimes. However, we were also able to tease out whether children and parents were both eating and whether they were eating the same foods and the conditions under which they did and did not do so (Brannen, O'Connell, and Mooney, 2013). The qualitative study also provided insight into the symbolic and moral aspects surrounding the concept of family meals as well as practices of eating together, while in the analysis of the quantitative data set the onus was on us to define what constituted eating together or not.

Given the risk inherent in the experimental nature of our analysis of NDNS data and the political appetite for statistical findings, we sought also to analyze participation in family meal frequency and socio-demographic factors in two other UK large-scale surveys, which have asked about children and adults eating together: the Millennium Cohort Survey and Understanding Society. Since these were not dietary surveys we could not examine associations of self-reported family meal frequency with diet outcomes, but we could examine the relationship with factors

such as hours of maternal employment. Albeit that the data were limited by their reliance on self report based on the assumption of a shared understanding of the concept of family meal as outlined above, in combining results with findings from our complementary analyses of the qualitative data and the NDNS ‘contextual data’, we hope to foreground the importance of methodology and highlight the complexities of measuring children’s participation in family meals and any association with socio-demographic factors or health and behavioral outcomes.

In disrupting common sense and taken for granted assumptions about the association between family meals and other factors such as mothers’ work and children’s overall diets, our findings based on applying a MMR approach – whilst unsettling in the sense of raising methodological uncertainties - speak directly to political and policy concerns in that they caution against the idea that family meals are some sort of ‘magic bullet’ albeit that they are a convenient way for politicians to (dis)place responsibility for children’s food intake upon parents (O’Connell and Simon, 2013; Owen, 2013).

CONCLUSION

We hope we have demonstrated some of the benefits as well as the methodological issues in multi method research. In particular it is important to take into account that quantitative and qualitative methods each suffer from their own biases and limitations. Survey diary data, while advantageous in measuring behaviors (for example what children ate), have the disadvantage that they do not address issues of meaning (in the above example concerning the study of family meals). Qualitative methods, while providing contextual and symbolic meanings (about food and meals for example), may not provide detailed information about what is eaten and how much.

However, it also needs to be born in mind that the combination of these methods may not provide a total solution either, as we have demonstrated with particular reference to our own study of food and families. Qualitative and quantitative methods may not together succeed in generating the knowledge that the researcher is seeking. In researching everyday taken for granted practices, both methods can suffer from similar disadvantages. In surveys, practices may not easily be open to accurate recall or reflection. Likewise, qualitative methods, even when a narrative approach is adopted, may not produce recall but instead provoke normative accounts or justifications. While survey data can provide a ‘captive’ sample for a qualitative study and the opportunity to analyze extensive contextual data about that sample, the two data samples may not be sufficiently comparable. Survey data conducted at one moment in time may not connect with qualitative data when they are collected at another time point (this is critical for example in studying children’s diets). Thus it may be necessary to build in resources into the qualitative phase of the inquiry for re-assessing children’s diet using a method based on that adopted in the survey. This may prove costly and require bringing in the help of nutritionists.

It also needs to be born in mind that many practices are clothed in moral discourses and are thereby difficult to study by whatever method. Surveys are renowned for generating socially acceptable answers but in interviews, respondents may not want to admit that they do not measure up to normative ideals. In discussing methodological issues in MMR, it is all too easy artificially to segment qualitative and quantitative approaches (Schwandt, 2005). As already stressed, MMR can provide an articulation between different theoretical levels as in macro, meso and micro contexts. However, these theoretical levels typically draw upon different logics of interpretation and explanation, making it necessary to show how different logics can be

integrated (Kelle, 2001). Moreover, we should not adopt a relativist approach but continue to subject our findings to scrutiny in order to draw less false conclusions.

Translating research questions across different methods of data collection may involve moving between different epistemologies and logics of inquiry and is likely to affect the data and create problems of interpretation as has been discussed in the example of families and food. Quantitative and qualitative analyzes do not necessarily map on to each other readily; they may be based on different forms of explanation. While sometimes they may complement one another, in other instances analyzes are dissonant. However, we should also expect that findings generated by different methods (or conducted at different points in time) do not match up. It is, for example, one thing to respond to an open-ended question in a face to face interview context and quite another to tick an item from a limited set of alternatives in a self completion questionnaire.

Given the complexities of linking quantitative and qualitative data sets, it is suggested that a narrative approach should be adopted in reporting the data analyses. By this we mean that in writing up their results the researchers should give attention to the ways in which the data have been integrated, the issues that arise in interpreting the different data both separately and in combination, and how the use of different methods have benefited or complicated the process. This is particularly important where MMR is carried out in a policy context so that policymakers and other stakeholder groups may be enlightened about the caveats associated with different types of data and, in particular, the advantages and issues of employing more one type of research methodology (typically quantitative data are preferred by policymakers) (Brannen and Moss, 2012).

In addition, the researcher should be attentive to the ways in which the processes of ‘translation’ involved in interpreting data are likely, often unwittingly, to reflect rather than reveal the contexts in which the research is carried out. Data have to be understood and interpreted in relation to the contexts in which the research is funded (who by and for whom), the research questions posed, the theoretical frameworks that are fashionable at the time of study, and the methods by which the data are produced (Brannen, 2005).

Just as when we use or re-use archived data, it is important in primary research to take into account the broad historical and social contexts of the data and the research inquiry. All data analyses require contextualization and whether this is part of a mixed method or multi-method research strategy, it is necessary to have recourse to diverse data sources and data collected in different ways. MMR is not only a matter of strategy. It is not a tool-kit or a technical fix nor is it a belt and braces approach. MMR requires as much if not more reflexivity than other types of research. This means that researchers need to examine their own presumptions and preferences about different methods and the results that derive from each method and to be open to shifting away from entrenched positions to which they cling – theoretical, epistemological and methodological. At a practical level, the multi method researcher should be prepared to learn new skills and engage with new communities of practice.

FUTURE DIRECTIONS

In future social science research is likely to become increasingly expensive. Primary research may also prove more difficult to do for other reasons, for example the restrictions imposed by ethics committees. Many researchers will have recourse to secondary analysis of existing contemporary data or turn to older archived data. MMR research will therefore

increasingly involve *the analysis of different types of data* rather than the application of different methods. For example, in our own work we have become increasingly engaged not only in examining data from different surveys but in interrogating the assumptions that underlie the variables created in those surveys and reconciling (or not) these variables with new qualitative data collected by ourselves.

Another possible trend that is likely to promote the use of MMR is the growth in demand for interdisciplinary research that embraces disciplines beyond the social sciences. This trend will require even more emphasis on researchers working outside their traditional comfort zones and intellectual and methodological silos. For example, in our own research on families and children's food practices we have been required to engage with nutritionists.

A third trend concerns the growing external pressure on social scientists to justify the importance of their work to society at large, while from within social sciences there is pressure on them to reassert the role of social science as publically and politically engaged. In the UK we are increasingly required by funding bodies – research councils and government - and by the universities to demonstrate the societal 'impact' of our research. Part and parcel of this mission is the need to demonstrate the credibility of our research findings and to educate the wider world about the rigor and robustness of our methods. In order to understand the conditions of society in a globalised world it will indeed be necessary to deepen, develop and extend our methodological repertoire. MMR is likely to continue to develop an increasingly high profile in this endeavor.

DISCUSSION POINTS

- (1) Discuss the benefits and challenges of linking a qualitative sample to a survey.

- (2) Identify within a MMR study a research question that can be addressed both by qualitative and quantitative methods and a research question that can be addressed via one method only; discuss some different ways of integrating the data from these methods.
- (3) Discuss two or three methodological strategies for integrating dissonant research results based on quantitative and qualitative data.
- (4) Create a research design for a longitudinal research project that employs MMR as part of that design.

WEBSITES

<http://eprints.ncrm.ac.uk>

This is the website of the UK's National Centre of Research Methods where its 'e-print' series of working and commissioned papers are found

<http://www.qualitative-research.net/fqs>

This is the website of a European online qualitative journal

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