Designing for multimodal data and mixed methods within a qualitative framework

Pat Bazeley

Abstract

Designing for multimodal data means one is, inevitably, also designing for a mix of methods, and for bringing what is learned through those different methods into cohesive study conclusions. In addition to the usual considerations of purpose and questions, this means specific attention is directed to defining the cases and samples for the study to maximise the potential for integration of varied data, and to planning for integrative analysis strategies that will lead to a report reflecting that integration.

Multimodality and mixed methods

Qualitative research focuses on understanding and interpreting constructions of the qualities of experiences and other phenomena, using data and methods that are flexible and relatively unstructured or open-ended. We tend to think first of using interpersonal interviews or focus groups as sources of data, but you might consider also (a) forms of written documentation, such as field notes, meeting notes, submissions, and historical records; (b) surveys that convey those constructions using both numbers and text; (c) social media content of varying types, with its associated metadata, and (d) visual and audiovisual data – not just photographs, artwork, and videos, but also the visual and spatial aspects of everyday environments. Qualitative sources therefore have the potential to be very varied both in what kind of data they provide, and in how they provide it – they are multimodal, and working multimodally is likely to draw on principles and practices of multimethod or mixed methods research.

"Multimodality refers to the interplay between different representational modes" (Kress & Van Leeuwen 2001: 20). The term multimodal is associated primarily with social semiotics – the theory of how alternative communicative, or semiotic, resources are selected and used separately or together to create meaning within a social context (Ledin & Machin, 2018). Discourse analysts utilising social semiotics differentiate between a mode of communication and a medium of communication.

- A *mode* is a channel of communication; a means of communicating meaning. Modes might be linguistic, visual, auditory, gestural, or spatial. Modes of communication might vary in synchronicity, directionality, and in their openness to public view (Hesse-Biber & Griffin, 2013).

- A *medium* is a substance through which communication happens, e.g., video, text, audio.

Multimodal data in qualitative research are those that employ multiple modes and/or media of communication to make and convey meaning of one's experience of a phenomenon. Any single medium for communication might employ multiple modes (e.g. video employs language, sound, and vision); a study might gather multiple media, with each employing the same or different modes. The primary goal, for most researchers, of recognising and deliberately employing different modes of communication is enhanced meaning-making.

Researching with multimodal data implies or requires use of multiple methods for gathering and/or analysing data. In multimethod research, different data are loosely connected around a common theme or purpose, and are typically brought together only when conclusions to the study are being drawn and discussed. Mixed methods, in the current context, involves a more deliberate integration of varied methods of gathering and/or analysing data throughout the research, such that they become interdependent in achieving a common research purpose (Bazeley, 2018). One could say, therefore, that mixed methods is "tighter" than multimethod research with regard to expectations concerning the level of mixing or integration of different data and the methods used to analyse them.

Multimodal, multimethod, and mixed methods approaches to social research are not new

Researchers have used combinations of different sources and types of data historically to contribute to their stock of knowledge about a question of concern to them. Classic examples include the community studies carried out by researchers associated with or influenced by the School of Sociology at the University of Chicago in the early-mid 20th century (e.g., Lynd & Lynd, 1929; Gans, 1967; Warner & Lunt, 1941), by British sociologists also in the mid-20th century (Bell & Newby, 1972; Bott, 1957), and by European researchers (e.g., Jahoda, Lazarsfeld, & Zeisel, [1933] 1971). It was the methods used by these researchers that informed the community study that was the first phase of my doctoral research in the 1970s (Bazeley, 1977). This resulted in a report in which information gleaned through an extended period of almost daily participant observation, key informant interviews, a detailed mixed-mode household survey, and a range of social indicator statistics was woven together to present a comprehensive picture of the mental health needs and resources of women in a disadvantaged community.

Studies from across history and across disciplines, from astronomy and geology to sociology, have effectively combined field observations with measurements, verbal with visual description, mapping with statistics, or used mixed-mode case studies, epidemiology, and/or surveys to answer a research question (Maxwell, 2016). Despite all team members typically engaging with all methods and with multiple types of data, intentionally using these together in developing as well as testing and supporting conclusions, these studies were neither labelled nor specifically recognised as being mixed or multimethod studies. Maxwell notes, additionally, that the integration of methods was seen as unproblematic in these studies; they offered no arguments about supposed philosophical foundations, nor was there any discussion in them about types of research or typologies of research design. Thus, while the terminology being used currently in mixed methods research circles might be new, the basic methods of combination or mixing being described are not.

Disciplinary areas most obviously and consciously adopting multimodal data and mixed methods approaches, and where most of the recent debates about combining methods have occurred, are in the professional disciplines of education and health, with psychology

and management studies also increasingly adopting current approaches to mixed methods. The frequency with which dual or more complex combinations of methods are being used across the disciplinary spectrum is difficult to assess – a brief survey in any area will reveal that methods are very often combined without being labelled as such, management studies being a clear example here (Bazeley, 2019; Maxwell, 2016). Increasing use of video (rather than audio only) to record data also mean that multimodal design and analysis are becoming more common.

Theoretical background and assumptions regarding use of multimodal data

The "interpretive turn" associated with qualitative methods in the later 20th century (Lincoln & Guba, 1985) brought with it a changing awareness of how a different philosophical-epistemological perspective could change one's approach to interacting with participants in research and interpreting data gathered through the research process. These sources were no longer seen as contributing factual information so much as they were communicating how people understood or construed their experience of the phenomenon or issue being investigated. With that shift in thinking, there was an implicit assumption by those promoting it that open-ended, verbal data were more likely to provide an insight into people's constructions than statistically-analysed numeric data. But regardless of whether data take the form of words, images, or numbers, and analysis is statistical, hermeneutic, or semiotic, interpretation is involved and their meanings are constructed by both the person creating or providing them in the first place, and by the researcher who analyses them.

Indeed, the so-called qualitative-quantitative distinction is just one of multiple dimensions that might be considered in gaining a comprehensive understanding of a phenomenon, and although it is the most common one to be considered, even that distinction is far from clear. It is impossible to develop a list of attributes that uniquely describe each of the poles of this dimension, further reinforcing the idea that there is no clear boundary or natural divide defining data types that might limit integration of varied data or the methods used for working with them. Rather, as Max Bergman (2008) suggests, it is more useful to describe data types and methods as belonging to different families, with a considerable amount of overlap (or interconnection) occurring across those families. While we can have a general sense that an approach to studying something is more qualitative or more quantitative in orientation, this lack of sharp boundaries means that multimodal data, requiring multiple or mixed methods to work with them, are often an instinctive choice and give a more rounded view when studying multidimensional phenomena.

The assumption to guide practice, therefore, is that there is no problem in combining data found in varied sources, using different modes for communicating meaning, and requiring different methods for analysis, when they are all viewed and interpreted from within a common paradigmatic perspective. Given the lack of clearly distinguishing characteristics, there is no logic, also, in requiring that in order for a study to be defined as mixed, it must include both a quantitative and a qualitative method. Methods used in social research regularly and often inherently "boundary-cross", combining some aspects, at least, of characteristics normally attributed to the other; for example, using numeric data inductively, statistically analysing counts derived from text, combining multiple methods in an ethnography.

Components of design involving multimodal data

Design has been likened to choreography, involving a combination of set routines and improvisation (Janesick, 2000), or "planned flexibility" (Bazeley, 2021) as the designer meets a need for rigour and maintenance of purpose while also allowing for creative management of contingencies with their associated complexity (Hunter & Brewer, 2015; Sanscartier, 2020). From a design point of view, flexibility and openness to emergent ideas are a necessary complement to planning ahead when working with multimodal data, as steps are taken to ensure focus and cohesion in the methods used. Additionally, tools and strategies to foster integrative thinking and analysis need to be designed into the project from the start.

Focusing a study

Goals for projects come from factors that are important in one's personal life, from areas of practice in which one works, from prior research or reading the academic literature, and from concerns about societal and environmental conditions around us. A clear goal is necessary to provide direction for a project, but that is not to say it cannot be modified to some extent during the project as more information comes to hand.

Once you have established a broad goal or purpose for the study, map out (diagrammatically) your ideas about where you are going with that topic. This will help to reveal the assumptions you hold regarding the topic – awareness of these assists you to take steps to avoid potential inbuilt biases that could affect your planning and conduct of the study. The primary purpose of doing so, however, is for you to see all the elements involved in the topic and start to break it down into manageable units. Then you can decide which you want to focus on for now, and which you will put aside for the time being. The intensity and rich complexity of multimodal data can mean that the project has to be more limited in scope than it might otherwise be – a sacrifice taken in return for greater depth of understanding for the components that are studied. Alternatively, it might be extended because you are able to take a detailed view of a phenomenon, but then use different data to place that within a broader context.

Awareness of the substantive and theoretical literature on your topic will help you further refine the focus your proposed study. A critical review of the substantive literature will point to what is already known, and where the gaps in knowledge are, so that you can refine your study goals to address issues that will take knowledge forward. Different theoretical perspectives on your problem provide insights into different aspects of the problem and different ways of seeing those. You might want to adopt one of those perspectives, or you might choose to compare what you will find if you test the assumptions of more than one theoretical perspective. Additionally, your review of the literature will suggest to you the methodological options that other researchers have taken, to help you decide which will work for you, and those that can be improved upon – perhaps by considering more than one mode or type of data.

This is a good time also to talk to colleagues to gain their feedback on your ideas. In the process, you will clarify your proposal as you explain it to others, doubling the benefit.

Using these preliminary reflections, reading, and conversations, with a clearer sense of where you are going, now set out some more specific objectives and research questions to guide your next steps. This is when you are most likely to be thinking about what kind of

information (data) you need, and who or what can provide that, with availability of that perhaps causing a rethink of what questions you will be able to ask and answer. As you do this, you will be thinking about how you might go about gathering that data, and how you can put it together – the design for your study.

The *Wellbeing* study, which will be used to illustrate some of the design points being made in this chapter, is an ongoing community-based study focusing primarily on older women who participate in health and wellbeing oriented classes conducted in several community settings through the Older Women's Network of NSW (Inc.) – a volunteer run, non-profit organisation with the overall goal of promoting the rights, dignity, and wellbeing of older women. Ongoing evaluation work being conducted in connection with one of OWN's Wellness Centres prompted a deeper research interest in what wellbeing might mean for older women in the context of declining health, and in understanding the relationship between health and wellbeing. This focus, while remaining quite broad, was given some specificity early in the project through a group discussion with volunteer leaders from across the network. From this, a theory of change model (shown in Figure 1) was developed to trace how group participation might contribute to maintaining older women in the community, and to reducing their dependence on medical and wider health services (Knowlton & Phillips, 2013). Reading literature associated with active ageing and with wellbeing contributed to a conceptual framework informing the study, for example, by ensuring the study took a capability approach to ageing and wellbeing, rather than a deficits approach.

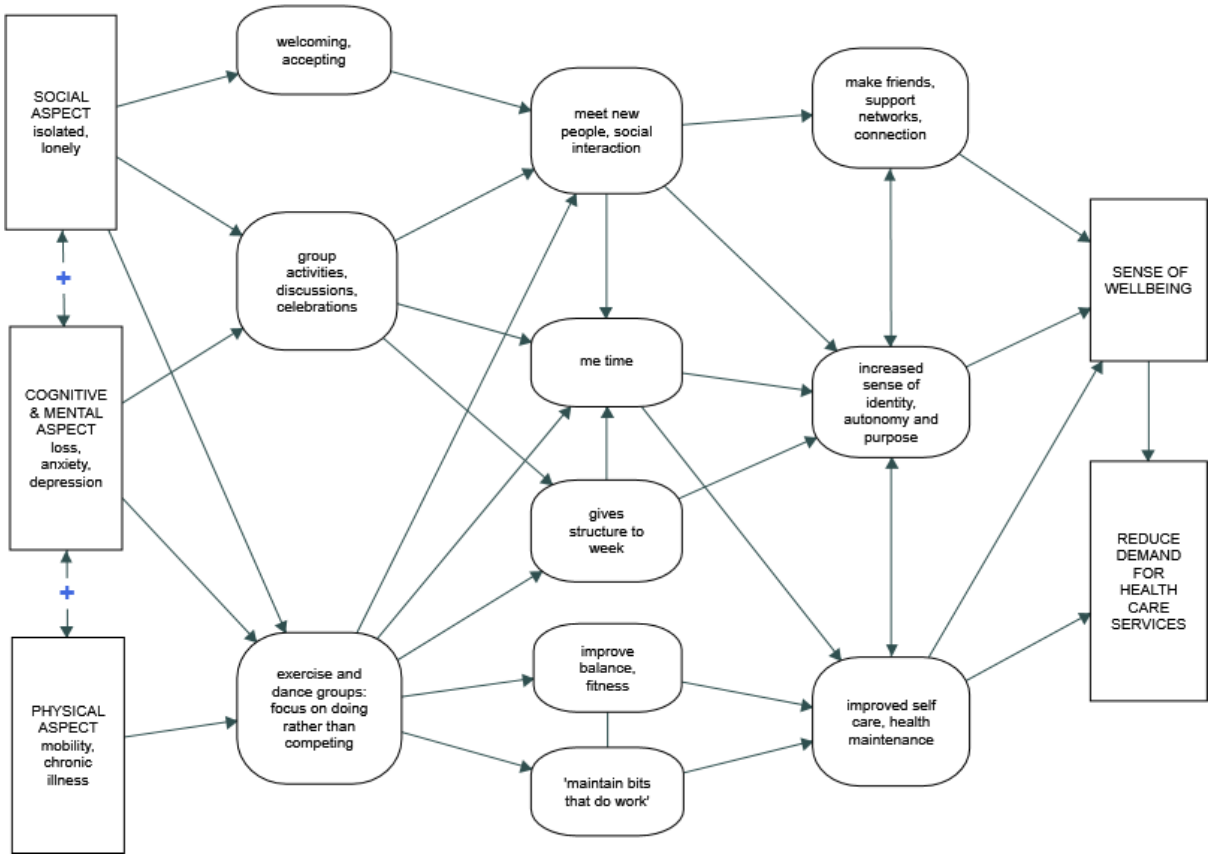

Figure 1 Simplified theory of change model for a wellness activity programme for older women

Adapted from Bazeley, 2018: 33, Figure 2.2

Multimodal data sources

The rationale of using multimodal data stems from an understanding of phenomena as being multidimensional. Put simply: a multidimensional phenomenon demands multimodal data in order to gain a holistic view of that phenomenon. As noted earlier, social semioticians suggest those data need to cover linguistic, visual, aural, gestural, and/or spatial modes of communication, as found in video, image, text, or audio sources. These might be accessed in their physical or electronic forms, as relevant to the sociocultural situation.

Mixed methods researchers typically draw on variants of observation, interview, video, surveys, and extracts from existing documents and/or databases as methods to build data resources for their studies, but they remain open to any form of data that might become available and accessible, as long as it offers relevant information or enhances understanding. A deliberate choice is made to either gather sources that are inherently multimodal or to gather sources of different types because they employ different modes, in the belief that this will give a better understanding of the experience or issue being investigated.

Wellbeing is a complex concept, generally thought of as having physical, mental, emotional, and social dimensions. Health, also, is complex and multidimensional, with extensive argument and shifts in direction about how best to define, in positive terms, what being healthy means. Multimodal/multimethod data therefore offers the possibility of building more comprehensive and holistic models of these critical concepts than would be available from single sources. Primary data available to the *Wellbeing* project include the aforementioned group discussion, interviews with volunteer coordinators, two groups of interviews and limited scaled data with current and former wellness centre participants from across the network, and evaluation survey responses comprising open-ended text with categorical and scaled numeric data for participants at one of the centres, gathered over multiple years. Additional early data includes responses to free-listing, word, and picture selection exercises (i.e., cultural domain data), and records of participation in the range of activities offered by the centre. As is common in social science projects, the physical data therefore largely comprise text and numeric media, although these are supplemented by visual input from time spent observing the centres in operation and promotional videos produced by the organisation. Additionally, all interviews and a large proportion of surveys were carried out face-to-face.

Sampling considerations in a mixed methods study

In qualitative and mixed methods work, a case orientation to data organisation and management is usual, if not essential; cases become the units of analysis. Cases typically comprise individual people; less often, groups or sites or instances of a particular phenomenon are treated as cases. In qualitative work, a case orientation focuses attention on contextually grounded, specific instances of a phenomenon while also allowing a broader cross-case perspective. In work involving multimodal data, a case orientation provides a basis for linking diverse data elements relevant to each case, regardless of whether one, a few, or many cases are being studied. Cases therefore become a critical component of linking and comparative strategies used to achieve effective integration.

How cases are selected, how many are selected, and what data are obtained in relation to each have relevance for the types of analyses you will conduct, the strategies you can use

for combining different data, and the possibility for transferring or generalising from your results to other cases or to a broader population. Samples generally are classified as being random, where every case within a defined population has an equal chance of being selected; purposive, where, for example, extreme, typical, diverse, or homogeneous cases are deliberately selected based on prior information; or theoretical, where cases are selected because they are thought to have attributes that will provide data expanding on or refining the researcher's emerging theoretical understanding. Often, in a study that combines varied components, more than one of these sampling strategies will be used.

Different data components might be selected and combined in one of four different ways. Each of these is designed to overcome potential problems that can occur when samples are selected using different strategies (Collins, Onwuegbuzie, & Jiao, 2007). Thus:

- Identical samples are those where different modes of data are gathered within the same sources or from different sources for the same cases;

- parallel samples that are selected using the same principles from the same or comparable populations, with different cases and sometimes different numbers of cases in each group providing data for the different methods being used;

- nested samples typically draw a smaller purposive sample for one form of data collection from within a larger random sample from which a different form of data are being collected;

- multilevel samples, using differing criteria, draw from different levels of the social setting being studied, where each level is a subunit within a higher-level unit, such as workers within departments that are in turn part of organisations, with all three levels providing data relevant to that level.

Case definition in the *Wellbeing* project is straightforward, with each participant in or associated with the programmes being a case. (Additional observational and cultural domain data are not associated with specific cases.) Data for each case includes text from interviews and/or surveys, demographic data, categorical responses to set questions, and responses assessing various aspects of health and wellbeing including use of currently existing scaled indicators, with records of participation to come.

Managing multimodal data

The way data and interim results are managed and organised during the conduct of a project will affect the researcher's capacity to effectively and fully analyse the data, and to write up results in an integrated way. This is especially so when data come in multiple modes or sources, and where different data are being recorded for each case.

While such projects are not dependent on software, use of it – particularly qualitative data analysis software (QDAS) – is beneficial in both managing the complexity and assisting analysis of multimodal data. Modern QDAS allows for the importation, annotation, and coding of text, audio, and visual data in such a way that a range of different materials can be brought together, in association with demographic and numeric data, for each case and also, independently of sources, for each topic in a project. Cases and topics are then able to be further searched or interrogated, drawing on either separate or combined data types. Use of

memoing and visual tools within QDAS or other software are also beneficial in bringing together insights from review and analyses of different sources and forms of data. Tracking of data and analyses is enhanced throughout the process, as sources are always identified, records of results can be saved, and data-management logs and reflective memos are stored. Alternatively, different modes of data (often in summary form only) can be stored together in a spreadsheet such as Excel, organised by topic or source (e.g., in columns) and by ordered cases (in rows).

Choosing and planning for use of different tools and strategies for data management, therefore, are a further component of the design process. Qualitative software is contributing to management and analysis of data in the *Wellbeing* project. Source data are stored in folders depending on how they were gathered; both text and numeric data for each person are assigned to a case, regardless of source, so that data for each person can be analysed as a composite unit, and to facilitate comparison based on numerically defined subgroups; all data (including background literature) are coded using the same coding system; data from different phases of the project are combined in sets to facilitate time-based selection or comparisons; reflective memos are recorded, with links to the evidence that prompted those reflections; and the summarising and visualisation capacity of software is being used to compare and explore aspects across and interrelationships within data, as well as to experiment with and record insights in the form of conceptual models.

Considering analysis as a component in design

The first point to note about analysis is that analysis starts from the very commencement of a project – from the point where a decision is made to investigate something and thought is given to the nature of that something, why it is of interest, and how it might be investigated. At these early stages, reflective writing plays a key role in prompting analytic thinking, with consequences for how the study is designed and will be conducted. This pattern needs to continue throughout the various design and data collection phases, as reflection on what is being learned and initial analyses of early data sources informs further data collection strategies and perhaps even feeds back into modification of goals and a reformulation of the conceptual framework for the study.

Some of the initial analytic work will be conducted with separate components of the data before being integrated – initial interpretation of texts and visual sources, initial coding and statistical analysis of numeric data. At other times, minimally processed data will be combined directly using integrative analysis tools and strategies, sometimes in combination with results from those preliminary analyses already conducted.

Planning for integration of multimodal and mixed methods data

As noted earlier, integration of different data into a coordinated, coherent whole is an essential component of a project which uses mixed methods. Quite apart from meeting a definitional criterion, integrating the different modes and sources of data gathered in a project simply “makes sense”, as they become interdependent and mutually informative. Additionally, when one considers that many, if not most, data sources are inherently multimodal, it does not make sense to ignore one or more aspects of the data in those sources. The result of integration, as these different dimensions in and across data are explored and evaluated, is likely to be a richer picture of the phenomenon, a deeper understanding of its nuances, and fresh interpretive insights, all contributing to expanding and enriching

knowledge. Awareness of strategies for integration when designing the study assists in ensuring that integration will eventuate. As with analysis generally, early thinking about how one mode or method can inform another, prompting exchange between them, will see more benefits gained.

Integration takes place throughout a project through iterative exchange, or "cross-infection" of understandings and ideas as you work with different modes or sources, or between team members conversing together as they work on different aspects of a project. Such exchange might occur naturally, or it can be planned. For example, team members will have regular discussions that ensure all those involved in a project understand and can contribute to all elements of it; they might also share data gathering and analysis experiences with others who work differently. Such strategies are important, in any case, for ensuring that different team members are "on the same page", and resolving potential conflicts.

Whether working solo or in a team, iterative exchange is promoted if results from different modes or methods are sorted and stored according to the particular subcomponent or topic they address as a reminder to view them together, rather than according to the sources or methods used. This integrated style of storing results and insights gained also facilitates later writing of a coordinated report. It is greatly facilitated if the data management and coding tools offered by qualitative data analysis software are used; the alternative solution is to make extensive use of headings and a document map/navigation pane in your word processing software (Bazeley, 2018, 2019).

Integration occurs more deliberately at one or more particular points during a project as a planned exchange, combination, or conversion of data. This latter "point of interface" mode of integration will be written into a design plan, while iterative exchange will more likely depend on the integrative awareness of the researchers – something built in from the foundations of the project.

What might a planned point of interface look like? There are four basic processes that support integration, although how integration appears in each project can be quite different, depending on the combinations of processes used, and the context in which they are put into practice. These four processes are:

- to *construct* one form of data collection or analysis (or aspects of these) based on what is learned from prior or concurrent data;

- to *combine* complementary information gained from more than one mode or source of data through weaving or merging those insights into a coordinated and/or expanded picture or set of conclusions;

- to *compare* different data as a means of sharpening and deepening understanding, either by contrasting them as they are placed side-by-side in a joint display, or by compare responses in one form of data (e.g., text about an experience) for subgroups defined using a different type of data (e.g., by age group, or by scores on a scale);

- to *convert* one mode of data presentation into another, usually to allow a different mode of analysis as a means of gaining a fresh view of that data. Conversion also allows different sources to then be *compiled* into a composite database for further

(usually statistical) analysis, with or without additional data contributed directly by other sources and/or preliminary analyses.

Understanding these integrative processes and how they are likely to be used or combined as they play out in your project will have implications for how the project is designed, especially with respect to sampling choices, timing of data collections and analyses, and for how data will be managed.

- Constructing one form of data collection (sampling or question design) based on understanding gleaned from another has an obvious relationship with design, given necessary sequencing of those data collection activities. Allowance should also be made at design stage for combining the information gained from those different sources once data collection is complete – if not during analysis of the second set, then at least as the results are being presented. All too often, preliminary data that has informed later work is neglected once that later work has matured.

- Combination of different data sources is the least demanding in terms of design requirements, except insofar as samples used for different sources need to be such that the resulting combinations have coherence. Additionally, to benefit analysis, data from different sources should be kept within a common database, with a common indexing, sorting, or coding system applied to them to facilitate their combination (or comparison). Doing so might involve conversion of data from one form to another, as described below.

- Comparative data might be deliberately drawn from different samples, but more often a matched or identical sample is used, so that the focus is on what the data are saying without distraction from who is saying it. If qualitative data are being sorted according to subgroups based on demographic, categorical, or scaled variables, then this is most effectively done if the different data sources are available for each individual case. This also makes it possible to identify cases that diverge from subgroup trends, for further investigation.

- Conversion of data to allow for alternative modes of analysis or compilation into a combined dataset typically requires that computer software has been used for the initial analysis, is used again for conversion of data generated through that initial analysis, and then also for the alternative form(s) of analysis, regardless of the direction of that conversion. For example, text or visual data might be coded using qualitative analysis software, with those codes then converted into variable data for use with statistical software in inferential or multivariate analyses – with each of these having sampling implications; or numerically coded panel data might be analysed using statistical regression procedures to establish and analyse event history – again with sampling implications for the design of the panel (Bazeley, 2018).

Integration in the *Wellbeing* project is primarily occurring through *construction* of later forms of data collection based on review and analysis of earlier forms, and through *combination* of all sources to provide interwoven evaluation information for the wellness centres about maintaining participation and the health and wellbeing outcomes of participation, while also building a merged model and theory of wellbeing for older women. More sophisticated statistical modelling, within- and across-case *comparative* analyses (using numeric data in combination with text), and visual analyses of patterns in responses (for both

numeric and coded text) will be used in an attempt to answer the more complex question of how health relates to wellbeing for community-living older women. Interrelationships between different aspects of the research are illustrated in Figure 2.

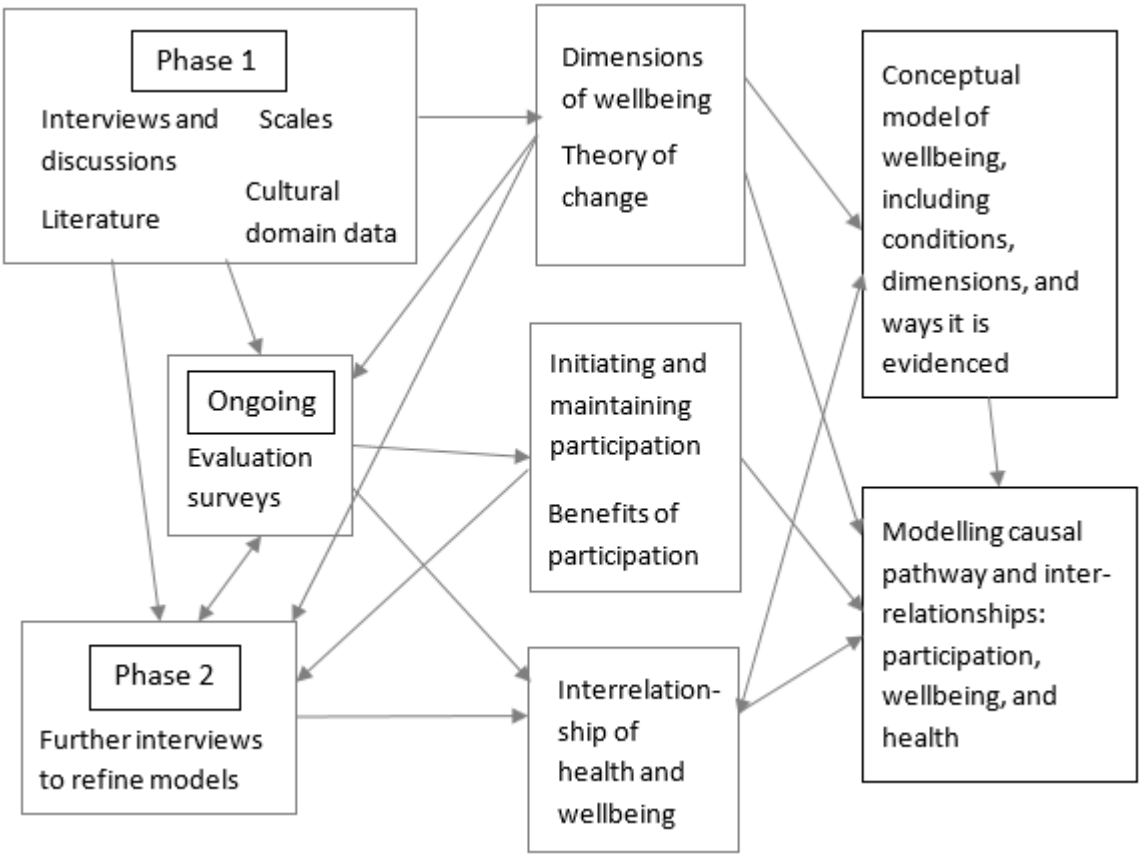

Figure 2 Interrelationships between components of the *Wellbeing* project

Planning for reporting

Finally, the researcher(s) should plan for integrated reporting of their results. As a general guideline, this means they will build a "story" with the results of the study that is focused on the topic of the research with information sequenced to tell that story, rather than being organised according to the method used to obtain it. This is because, presumably, the research was driven by its purpose or focus, while the methods used to gather and analyse data were simply tools to advance that purpose.

Bringing it all together: coherence in design

Sometimes details of design can be specified only after the study has been done, particularly if the approach to the project was emergent and developed over time in response to what was happening in the field (Flick, 2019). Given the complexity of projects using multimodal data and mixed methods, however, preliminary planning is needed to ensure coherence between the various components of the project; even an exploratory study that is expected to develop

as the research proceeds begins with a plan. In particular, coherence is needed between the purpose or goals of the project, its conceptual framework, the questions it seeks to answer, methods being used, and strategies to ensure the inferences from the project are valid (Maxwell, 2013).

Methodologists working in the mixed methods arena have been active in developing typologies of design, providing a set of labels and standard formats for combining multimodal data, mixed data sources, and for integrating mixed analysis strategies (e.g., Creswell & Plano Clark, 2018; Onwuegbuzie & Hitchcock, 2015; Tashakkori, Johnson, & Teddlie, 2020). These typologies are predicated on there being a clear distinction between qualitative and quantitative methods and, with this being the only dimension considered in the various models, they encourage binary rather than multidimensional thinking. In addition, they present a generally linear, rather than interactive, view of design, and generally each is focused on a single point of interface between methods, thus oversimplifying the potential variability, complexity, fluidity, and responsiveness needed when working with multimodal data and mixed methods. Rather than imposing a design label, providing a description of the data sources, samples, and methods used in sufficient detail that a reader can understand how the results were generated offers greater clarity and transparency to the study, and increases the reader's confidence in the validity of the interpretations offered.

Setting out the questions asked in a study and the (proposed) methods used to answer them in a design table is a useful strategy (e.g., Table 1). It helps the researchers clarify, in their own mind, what they are setting out to do and achieve, and it clarifies this also – in an abbreviated form – for those potentially reviewing grant applications, or later, for readers of articles where results are presented. Similarly, creation of a visual design diagram (similar to that in Figure 2, above) can be useful for clarifying and illustrating the plan for carrying out the study.

There is a sense in which the *Wellbeing* project is two projects in one, because it is serving both an evaluation purpose and a research purpose, and so one might question the coherence of the overall project. Before this project was commenced, evaluation for the one partially funded centre regularly assessed just current health status in an administratively burdensome way, without benefit to either the funding body or those running the centre. Additionally, the legitimacy of including some activities less directly associated with physical health in the programme was questioned. An argument was presented that improving wellbeing more broadly would benefit health, and that a broader-based, annual evaluation would provide more useful information to both the funding body and to those responsible for organising the centre's programmes. Thus, while simply-structured, standardised scales for health status and wellbeing are being used in the interim, supplemented by other information, questions and theory related to what wellbeing means for older women and how that relates to health are being pursued with the goal of improving the evaluation model for this centre, and for others which, like it, are designed to meet the broader health and wellbeing needs of older women.

Table 1 An overview of questions and methods for the *Wellbeing* project

Specific research questions	*Theoretical/ conceptual basis*	*Data sources*	*Data analysis*
What does wellbeing mean for older women?	Approaches to theorising concepts. Capability-agency approach to life well lived.	Free-listing, card sorts, photo elicitation. Interviews. Literature.	Cultural domain statistics; coding interview data. Concept analysis – merging ideas from different sources to identify dimensions and indicators.
How does participation in OWN Wellness Centre programmes impact on health and wellbeing?	Active ageing/ healthy ageing theories/ research.	Annual surveys (linked for cases), including: – use of health services, health and wellbeing indicators, physical and social activity; – comments on aspects of participation and outcomes of that. Observations and attendance statistics. Case studies of participants.	Descriptive statistics, repeated measures, relationships between age, attendance, activity levels and outcomes. Code comments and relate to indicators of participation and outcomes. Build case profiles from multiple sources. Within and cross-case analyses.
What is the relationship between physical health and general wellbeing?	Health as adapting and self managing *vs* health as absence of illness. Life satisfaction theories. Self-determination theory.	Annual surveys; Interviews: aspects of health, wellbeing, and successful ageing, including activity, agency, autonomy, perspective.	Statistical relationships between health and wellbeing variables. Case analysis using summary grids. Theorising relationship (grounded theory; CR – identifying mechanisms in relationship).

Limitations when working with multimodal data

There are a number of risks associated with conducting multimodal studies, particularly within an open and flexible theoretical and methodological framework such as I have suggested in this chapter. The study can grow beyond the capacity of timeframe or budget allowed. Taking an emergent perspective to its development means it can become somewhat uncoordinated and start to lack coherence as different directions are pursued and/or different sources of data become available. Perhaps most critical is the level of experience needed by the researcher or within a coordinated research team, given requirements to manage and

coordinate data of different types and analyses from different traditions; maturity of judgement is needed to make appropriate adjustments to data collections and analyses in response to ongoing interpretation of the data, participant response, and often unplanned circumstantial events (Hunter & Brewer, 2015).

New developments and perspectives

Those using multimodal approaches to researching interaction, communication and meaning making are exploring digital technologies and human-computer interaction (Flewitt, Price & Korkiakangas (2019). Social researchers more generally, including those already using mixed methods, are increasingly adopting multimodal data and hybrid methods, particularly those using video technologies, to supplement their more traditional work with text and numeric data. Social network analysis (SNA) and geographic information systems (GIS) are also being used in mixed methods projects, with each of these contributing visual and spatial dimensions to an analysis. Use of the internet, with its frequent combination of text, audio, visual, and numeric modes of presentation has become more common as a source of data. Social media data (e.g., from Twitter or Facebook) adds a time dimension as well as their basic text and numeric data to a range of analyses (especially SNA). Capturing the potential of "Big Data" brings with it the need for automation of preliminary analysis strategies.

These new (and some not-so-new) developments have come about primarily through developments in technology – technology for capturing data, and tools and algorithms for analysing those data. Basic principles of and strategies for design of studies using multimodal data and mixed methods do not change with these developments, however. Researchers still need to carefully consider their purpose and questions, to place these within a substantive and theoretical framework, and to devise ways of answering them, using data, samples, and analysis strategies that bring together different sources using different modes of communication, to eventually arrive at warranted conclusions presenting valid inferences. The particular tools and technologies used are not an issue, as long as they contribute to this goal.

Further readings

Bazeley, P. (2018). Integrating analyses in mixed methods research. London: Sage.

Ledin, P., & Machin, D. (2018). *Doing visual analysis: From theory to practice*. London: Sage.

Sanscartier, M. D. (2020). The craft attitude: Navigating mess in mixed methods research. *Journal of Mixed Methods Research*. doi: 10.1177/1558689818816248

References

Bazeley, P. (1977). *Community development for mental health.* (PhD), Macquarie University, Sydney.

Bazeley, P. (2018). Integrating analyses in mixed methods research. London: Sage.

Bazeley, P. (2019). A practical introduction to mixed methods for business and management. London: Sage.

Bazeley, P. (2021). *Qualitative data analysis: Practical strategies* (2nd ed.). London: Sage.

Bell, C. & Newby, H. (1972). Community studies: An introduction to the sociology of the local community. London: Allen and Unwin.

Bergman, M. M. (2008). The straw men of the qualitative-quantitative divide and their influence on mixed methods research. In M. M. Bergman (Ed.), *Advances in mixed methods research* (pp. 11–21). London: Sage.

Bott, Elizabeth (1957). *Family and social network*. London: Tavistock Publications.

Collins, K. M. T., Onwuegbuzie, A. J., & Jiao, Q. G. (2007). A mixed methods investigation of mixed methods sampling designs in social and health science research. *Journal of Mixed Methods Research, 1*(3), 267–294. doi:10.1177/1558689807299526

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Thousand Oaks, CA: Sage.

Flewitt, R., Price, S., & Korkiakangas, T. (2019) Multimodality: Methodological explorations. *Qualitative Research, 19*(1), 3–6. doi:10.1177/1468794118817414

Flick, U. (2019). From intuition to reflexive construction: Research design and triangulation in grounded theory research. In A. Bryant & K. Charmaz (Eds.), *Current developments in grounded theory* (pp. 125–144). London: Sage.

Gans H. J. (1967). The Levittowners: Ways of life and politics in a new suburban community. New York, NY: Columbia University Press.

Hesse-Biber, S., & Griffin, A. J. (2013). Internet-mediated technologies and mixed methods research: problems and prospects. *Journal of Mixed Methods Research, 7*(1), 43-61. doi:10.1177/1558689812451791

Hunter, A., & Brewer, J. (2015). Designing multimethod research. In S. Hesse-Biber & B. Johnson (Eds.), *Oxford handbook of multimethod and mixed methods research inquiry* (pp. 185-205). New York: Oxford University Press.

Jahoda, M., Lazarsfeld, P. F., & Zeisel, H. (1933]1971). *Marienthal: The sociography of an unemployed community*. Chicago, IL: Aldine Atherton.

Janesick, V. J. (2000). The choreography of qualitative research design: minuets, improvisations and crystallization. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 379-399). Thousand Oaks, CA: Sage.

Knowlton, L. W., & Phillips, C. C. (2013). *The logic model guidebook* (2nd ed.). Thousand Oaks, CA: Sage.

Kress, G., & van Leeuwen, T. (2001). Multimodal discourse: The modes and media of contemporary communication. London: Arnold.

Ledin, P., & Machin, D. (2018). *Doing visual analysis: From theory to practice*. London: Sage.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Lynd, R. S., & Lynd, H. M. (1929). *Middletown: A study in American culture*. New York, NY: Harcourt, Brace

Maxwell, J. A. (2013). *Qualitative research design* (3rd ed.). Thousand Oaks, CA: Sage.

Maxwell, J.A. (2016). Expanding the history and range of mixed methods research. *Journal of Mixed Methods Research, 10*(1), 12-27. doi: 10.1177/1558689815571132

Onwuegbuzie, A. J., & Hitchcock, J. (2015). Advanced mixed analysis approaches. In S. Hesse-Biber & B. Johnson (Eds.), *Oxford Handbook of multimethod and mixed methods research inquiry* (pp. 275-295). New York: Oxford University Press.

Sanscartier, M. D. (2020). The craft attitude: Navigating mess in mixed methods research. *Journal of Mixed Methods Research*. doi: 10.1177/1558689818816248

Tashakkori, A., Johnson, R. B., & Teddlie, C. (2020). *Foundations of mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.

Warner, W. L., & Lunt, P. S. (1941). The social life of a modern community. Westport, CT: Greenwood Press.