

Undertaking a mixed methodology in social science. What is it?

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Abstract: *The purpose of this article is to help guide the researcher when considering a mixed methodology in social science. Using a mixed methodology can help provide a more comprehensive picture, comparing findings from quantitative data (breadth- how often, and how many) and qualitative data (depth- how and why) with the intention of increasing levels of confidence and validity. It allows flexibility where the researcher can choose the methodological approach(es) being adopted that they consider to be the most helpful. Mixed methodology can be described as explanatory sequential, exploratory sequential, convergent/ concurrent/ parallel or embedded design. As an example, this article explains the explanatory sequential approach where quantitative data is first collected followed by qualitative data. Thematic analysis is discussed. It is a way of identifying, analyzing and reporting patterns. This article also reflects on the role of critical analysis and the application of a systematic review. Terms such as objectivism, subjectivism and empiricism are introduced. Theoretical underpinning is further developed with discussion associated with key approaches that include ethnography, grounded theory, phenomenology, narrative, discourse analysis, and positivism/ post positivism. Advantages and drawbacks of a mixed methodology are also discussed. Ethical considerations are reflected upon and examples of limitations identified.*

Keywords—Mixed methodology, quantitative, qualitative, explanatory, exploratory, convergent, sequential, thematic analysis, critical analysis, systematic review, objectivism, subjectivism, empiricism, ethnography, grounded theory, phenomenology, narrative, discourse analysis, positivism/ post positivism, ethical considerations, limitations.

1. INTRODUCTION.

The purpose of this article is to pull together different sources and concisely explain the role of mixed methodology when undertaking research in social science. It is also intended as a guide for the researcher when considering a mixed methodology in social science.

The use of a mixed methodological approach emerges as a distinct research methodology in the 1980's and 1990's (Creswell and Plano Clark, 2011; Teddlie and Tashakkori, 2003). It is used where the findings from quantitative and qualitative data are combined in one study. A mixed methodology can provide fuller answers to the research objectives and research questions being asked when compared to the use of a single methodology (Creswell and Plano Clark, 2011; Scammon, Tomoiaia-Cotisel, Day, Day, Kim, Waitzman, et al, 2013). It is going beyond a single methodology that can help form richer and more robust findings while seeking to address research questions where one set of data may be insufficient to provide a complete or broader picture, linking the purpose (research questions) with procedures (research methods (Creswell, 1999; Morgan 214). It is now considered as a legitimate third methodological approach/ paradigm following recognition of the limitations associated with the use of a quantitative or qualitative approach when used alone (Doyle, Brady and Byrne, 2009; Johnson and Onwuegbuzie, 2004). A mixed methodology is a powerful tool, when investigating complex systems and processes in studies associated with health, that can be extended to other areas of study helping to provide a more comprehensive appreciation of complex phenomena (Fetters, Curry and Creswell, 2013; Greene, 2007; Hussein, 2009).

2. WHAT IS A MIXED METHODOLOGY?

Undertaking a mixed methodology in social science combines findings from quantitative (numeric) data with findings from qualitative data (non-numerical data) (Creswell and Plano Clark, 2011; Timans, Wouters and Heilbron, 2019). Rather than being mutually exclusive, the use of quantitative and qualitative content in a mixed methodology can be considered as complimentary along a continuum (Ercikan and Roth, 2006). A mixed methodology is also where the collection of primary data is analyzed and evaluated alongside secondary data that can help explain the findings from one data set with another allowing for the possibility of fuzzy generalization to be made to a wider population (Bassey, 2001).

2.1 Fuzzy generalizations.

The challenge is to generalize the findings to a wider population (Gamble and Hewlett, 2026). Bassey (2001) explains that rather than stating the certainty that scientific generalization can be made (for example, x in y circumstances results in z), fuzzy generalizations can be made with the acknowledgement of uncertainty (for example x in y circumstances may result in z). The word certainty is replaced by the word uncertainty.

2.2 Mixed methodology using primary data and secondary data.

2.2.1 Primary data.

Primary data is original firsthand information collected by the researcher (Birmingham, 2020). Newby (2014) advises that the main sources associated with primary data include ideas (epistemology- knowledge /ontology- nature of reality), places (context- setting) and objects (data- physical evidence)

and people (participants- experiences, intra and interpersonal relationships). The findings can be in the form of quantitative and/ or qualitative data and can include content from sources such as questionnaires/ surveys, focus groups, interviews and observations (Baral, 2017).

2.2.2 Secondary data.

Secondary data includes existing quantitative and/ or qualitative data that have been collected by someone else (Watkins, 2022; Wickham, 2019). Secondary data can include content from sources such as academic journal articles, data sets, statistical data, textbooks, census data, public records and reputable websites.

2.2.3 Deductive/ inductive approaches.

A mixed methodology can also combine a deductive approach (theory testing) with an inductive approach (theory generating). For example, findings from interviews may generate and build on theory while findings from quantitative data (questionnaire/ survey) are used to test the theory (Gilgun, 2005, 2019). A deductive approach is where the researcher uses existing theory to examine processes, meanings, intra and interpersonal relationships and narratives (Fife and Gossner, 2024). This approach is used where the researcher seeks to confirm, deny or revise existing theory. An inductive approach focuses on the development and establishment of theory (Hodkinson, 2008; Locke, 2007).

3. EXAMPLES OF MIXED METHODOLOGIES.

Examples of mixed methodology include explanatory sequential, exploratory sequential, convergent/ concurrent/ parallel and embedded design (Kasakewitch, Coelho and Lima, 2025; Subedi, 2016).

3.1 EXPLANATORY AND EXPLORATORY SEQUENTIAL APPROACH.

An explanatory sequential approach is where quantitative data is first collected followed by qualitative data to help explain the quantitative findings. (Draucker, Rawl, Vode and Carter-Harris, 2020). An exploratory sequential approach first begins with qualitative data and is followed by quantitative data (Christodoulou, 2025).

3.2 CONVERGENT, CONCURRENT OR PARALLEL APPROACH.

A convergent, concurrent or parallel mixed methodology is where quantitative data (numbers) are collected at the same time as qualitative data (experiences/ words) (Fetters, Curry and Creswell, 2013).

3.3 EMBEDDED DESIGN.

A convergent, concurrent or parallel mixed methodology is where quantitative data (numbers) are collected at the same time as qualitative data (experiences/ words) (Fetters, Curry and Creswell, 2013). An embedded design is where one dominant data set (for example quantitative or qualitative data)

is supported by another set of (quantitative or qualitative) data that may help explain or enrich findings (Scholz and Tietje, 2002). An embedded design may be convergent/ concurrent or sequential (Creswell, 1999; Creswell, Plano Clark, Gutmann, Hanson, 2003; Fetters, Curry and Creswell, 2013). As an example, the following section discusses the explanatory sequential approach in more detail.

4. EXPLANATORY SEQUENTIAL APPROACH (QUANTITATIVE DATA FOLLOWED BY QUALITATIVE DATA).

4.1 QUANTITATIVE DATA.

Quantitative data contains numbers, figures and/or statistics. It is any data that can be measured in numerical terms that are analyzed to identify patterns (McLeod, 2025a; Slater and Hasson, 2024). The data are first collected, analyzed and evaluated. This can include the use of a survey/ questionnaire, findings from censuses, official statistics, observational behavior, counts and transaction data.

Analysis and evaluation of quantitative data seek to answer the question as to how many (Bazen, Barg and Takeshita, 2021).

Quantitative data can be divided into either continuous data and/ or discrete data where continuous data are associated with measurements and discrete data are associated with counts (Dettori and Norvell, 2018).

McCue (2015) explains that continuous data are associated with a continuous trend that can be measured on a scale that may have unlimited numbers or values. Continuous data may include ratios, decimals or fractions; for example, weight, height, length, depth, time, temperature, speed and distance (Dettori and Norvell, 2018; McCue, 2015; Mishra, Pandey, Singh and Gupta, 2018). To help visualize findings, continuous data can be shown in scatter plot diagrams, density plots, histograms or line graphs (Khatri, 2025).

In comparison, discrete data are mutually exclusive with a limited or finite number of values that are also associated with a defined whole number with emphasis on distinct categories (Brown, Hendrix, Hedges and Smith, 2012; McCue, 2015). For example, the number of people in a room, the number of vehicles on a road, (McCue, 2015). McCue (2015) adds that discrete data are also associated with binary choices such as gender, the answer yes or no. The findings can be presented in the form of pie and bar graphs/ charts, and frequency tables (Baran and Jones, 2016; Buckler and Walliman, 2016). It is important to note that discrete data do not have connecting points and findings should be clearly explained (Castle and Buckler, 2018).

Whether continuous or discrete data are used, the analysis of the findings from quantitative data can help predict behavior, identify and measure trends, identify possible cause and effect of relationships and test correlation of data that can provide fuzzy generalization to a wider population (Barroga and Matanguihan, 2022; Lee, 2014; Bassey, 2001; Slater and Hasson, 2024).

4.2 QUALITATIVE DATA .

Following the quantitative phase to the study, in a sequential approach to the mixed methodology, qualitative data are then obtained (Fetters, Curry and Creswell, 2013). Qualitative data are associated with non-numerical data and includes the use of in-depth interviews, case studies, participant perceptions, experiences, observations and/ or focus groups (Pyo, Lee, Choi, Jang and Ock, 2023; Tenny, Brannan and Brannon, 2022; Vanderstoep and Johnston, 2009; Yadav, Gupta and Choudhary, 2026). Qualitative data seeks to answer the reason why and how (Cleland, 2017). The data provides deeper meaning to the research being undertaken and explores real world problems, while seeking to understand motivations, experiences, opinions, subjective meanings and underlying factors that may influence human behavior (Moser and Korstjens, 2017; Tenny, Brannan and Brannon, 2022). It is understanding the lived experiences of participants and how the social environment is interpreted (Cleland, 2017).

Presentation of the qualitative data can be structured around a thematic approach. It is a popular way of analyzing qualitative data from such sources as interview data and focus group transcripts (Jowsey, Deng and Weller, 2021). Thematic analysis is a way of identifying, analyzing and reporting patterns (Braun and Clarke, 2006; Castleberry and Nolen, 2018; McLeod, 2024a).

Castleberry and Nolen (2018) explain that thematic analysis involves a systematic process of compiling, disassembling and reassembling data followed by the interpretation and concluding of the process. As data are analyzed, themes emerge that can be supported by quotes from interviews or from observations made (Roberts, Dowell and Nie, 2019). Whereas it is widely used, there is no overall agreement as to what thematic analysis is and its application (Boyatzis, 1998; Braun and Clarke, 2006; Vaismoradi, Turunen and Bondas, 2013). It is, however, an approach that is popular with those undertaking qualitative research (Braun and Clarke, 2012; Kiger and Varpio, 2020; Naeem, Ozuem, Howell and Ranfagni, 2023). Boyatzis (1998) states that the use of thematic analysis should be regarded as a tool that can be used across different methodological approaches. However, Braun and Clarke (2006) suggest that thematic analysis should be considered as a methodology in itself.

5. CRITICAL ANALYSIS AND SYSTEMS REVIEW IN A MIXED METHODOLOGY.

Undertaking studies in social science requires critical analysis of existing literature and theories. Whereas the term defining critical thinking has changed in recent decades, it can be described as the logical and reasoned process of skillful conceptualization of application, analyzing, summarizing/ synthesizing and evaluation findings (Elder, 2022; Hatcher, 2016; Mulnix, 2012). This can be in the form of a systematic review that identifies, analyses, evaluates and summarizes/ synthesizes relevant content on the topic being studied (Pearson, White, Bath-Hextall, Salmond, Apostolo and

Kirkpatrick, 2015; Petticrew, 2023; Petticrew and Roberts, 2006). A systematic review goes beyond the role of describing findings to interpreting them, connecting quantitative trends with qualitative insights. Stages associated with a systematic approach can be summarized, as shown, in the table below.

Table 1: Stages of a systematic approach

Stage number	Item	Description
1	Description	Identification and summarizing the main arguments put forward in key literature sources.
2	Interpretation	Placing in context the meaning and understanding of the findings from the literature.
3	Evaluation	Identification and reflection of strengths and weaknesses associated with the findings.
4	Integration/ synthesis	Comparison and contrast of findings, identification of themes

(After: Barnett-Page and Thomas, 2009; Card, 2012; Cooper, 2017; Fink and Gantz, 1996; Flemming, 2009; Major and Savin-Baden, 2010; Schick-Makaroff, MacDonald, Plummer, Burgess and Neander, 2016).

5.1 KEY TYPES OF SYSTEMATIC REVIEWS.

It is important that the researcher appreciates and understands different approaches to undertaking a systematic review. This section identifies key types of systematic reviews that can be considered. These include the classic approach, a meta-analysis approach, a scoping review, a rapid review and an umbrella approach.

The classic approach focuses on strict pre-defined criteria, rigorous analysis and reproducible synthesis/ summary (for example, Akl, Khabasa, Petkovic, Magwood, Lytvyn, Motilall, et al, 2024; Brown, 2026; Grant and Booth, 2009; Haddaway, Woodcock, Macura and Collins, 2015; Munn, McArthur, Klugar, Stannard, Cooper, Enuameh, et al, 2023; Paul and Barari, 2022; Porritt, McArthur, Lockwood and Munn, 2023).

A meta-analysis approach uses a statistical approach that combines findings from a number of quantitative studies (Gates, 2022; Lau, Ioannidis and Schmid, 1997). Alternatively, a meta-analysis approach can synthesize findings from a number of qualitative studies guiding the researcher to new interpretation of content (Thomas and Harden, 2008; Timulak, 2009, 2014).

A scoping review involves mapping of existing literature with the purpose of identifying key factors together with gaps in the findings (Mak and Thomas, 2022; Peters, Godfrey, Khalil, McInerney, Parker and Soares, 2015).

A rapid review allows for a quick systematic review from which conclusions can be drawn (Ganann, Ciliska, Thomas, 2010).

An umbrella review sums up the findings from existing systematic reviews (Aromataris, Fernandez, Godfrey, Holly, Khalil and Tungpunkom, 2015; Falkner, Fagan and Lee, 2021; Kolaski, Logan and Ioannidis, 2023).

The following section provides an example of a systematic review using the Mixed Methods Appraisal Tool.

5.2 EXAMPLE OF SYSTEMATIC REVIEW- MIXED METHODS APPRAISAL TOOL (MMAT).

To exemplify a systematic approach, the mixed methods appraisal tool (MMAT) is presented first in 2006 that is designed to systematically review findings from quantitative and qualitative data (Pluye, Gagnon, Griffiths, and Johnson-Lafleur, 2009). A wiki tool kit is developed later that provides advice and guidance for those undertaking systematic reviews associated with mixed methodologies (Pluye, Hong, Granikov and Vedel, 2018). This toolkit includes eight stages as summarized in the table below.

Table 2: The mixed methods appraisal tool (MMAT).

Stage number	Item
1	Devising the question(s) that can be asked and addressed in the review.
2	Defining the relevant eligibility criteria.
3	Selection of relevant information/ documentation.
4	Identification of relevant studies.
5	Undertaking the appraisal of relevant studies.
6	Extraction of data.
7	Synthesis of relevant studies.
8	Reporting results.
(After: Pluye, Hong, Granikov and Vedel, 2018).	

Whereas the MMAT can be used to appraise many types of methodologies, it is important to note that, it cannot be used with non-empirical findings, for example- studies relying on economic, diagnostic, theoretical and abstract content (Abbott, 1998; Hong, Fabregues, Bartlett, Boardman, Cargo,

Dagenais, et al, 2018; Hong, Pluye, Fabregues, Bartlett, Boardman, Cargo, et al, 2018).

6. POSITIVISM/ POST POSITIVISM, OBJECTIVISM, AND EMPIRICISM.

Within the context of a mixed methodology, it is important to understand and appreciate the terms positivism (realism), objectivism (ontology) and empiricism.

6.1 POSITIVISM.

Positivism is associated with realism. It can be described as an objective and dualist approach where the researcher and subject being studied are considered independent of each other (Bryman, 2012; Park, Konge and Artino, 2020; Sarantakos, 2013). Valuing the role of empirical knowledge and rationalism over other methodological approaches, the researcher remains detached and acts as a controller within the research process (Phoenix, Osborne, Redshaw, Moran, Stahl-Timmins, Depledge, et al, 2013).

6.2 POST POSITIVISM.

Expanding the term further, O’Leary, (2004) explains that whereas positivism relies on facts, post positivism is regarded as holistic and intuitive. It recognizes that, as human beings are biased in the perception of the world around them, the truth of reality cannot be explained (Dawadi, Shrestha and Giri, 2021; Maksimovic and Evtimov, 2023). Post positivism allows for subjectivity in the study, acknowledging human limitations and that total objectivity is impossible (Salzmann-Erikson, 2024).

6.3 OBJECTIVISM.

Objectivism is associated with one reality, that which is lived in, and that truth that can be measured (Thomas, 2011). It has its own identity and exists apart from one’s own awareness/ perception and can be objectively measured using scientific application and empirical observation (Hart, 1999; Sarantakos, 2013). Dansabo and Bello (2019) describe objectivity as unbiased inquiry. This implies that the researcher in social science can set themselves at a neutral standpoint and not be influenced or biased by preconceived thoughts and values. However, the reality of being free from bias is likely to be rare. To help address this, Reber and Bullo (2019) put forward the term conditional objectivism where the researcher identifies and acknowledges the values that may influence their findings. Reber and Bullo (2019) add that it is a strategy that can connect social science with practical decision making.

6.4 SUBJECTIVISM.

Whereas objectivism is associated with empirical and scientific measurement, subjectivism is associated with knowledge that is gained from feelings, emotions, experiences and perception (Hertel-Storm, 2021; Tye, 1986; Yeager, 1995). It focuses on understanding and interpreting qualitative content associated with methodologies such as narrative

analysis, discourse analysis, ethnography and interpretivism (for example, Avdi and Georgaca, 2009; Branney, 2008; Burck, 2005; Gralewski, 2011; Hegelund, 2005; Rosaldo, 1994; Ryan, 2018; Stevenson, 2004). Methodologies using subjectivism helps the researcher to understand the lived experience (Ladkin, 2005; Levitt, Surace, Wu, Chapin, Hargrove, Herbitter, et al, 2022). It embeds the researcher into the study rather than placing them at a detached point of view (Gunbayi, 2020; Rezugui, 2007).

6.5 EMPIRICISM.

Whereas subjectivism is associated with a person's senses, feelings and experiences and how they interpret and filter an observation; empiricism is associated with objectivity and is formed through experience and facts (Gupta, 2006; Newell, 2015; Sarantakos, 2013; Sellars, 1956).

Empirical studies involve rigorous testing before the findings are considered knowledge (Bryman, 2012; Drescher, Perera, Johnson, Buse, Drew and Burgman, 2013; Flynn, Sakakibara, Bates and Flynn, 1990). For example, research associated with empiricism include clinical trials where a new drug may be tested on patients and its effects observed. Another example of empiricism is Bandura's Bobo doll experiment where children watch aggressive behavior in an aggressive, calm and no adult situation. The children are then observed to investigate whether they imitate adult behavior. The conclusion to the study is that children shape their own behavior by watching others (Bandura, Ross and Ross, 1961; Graham and Arshad-Ayaz, 2016; McLeod, 2025b).

7. THEORETICAL UNDERPINNING.

Within the application of a systematic review and delving deeper into the theoretical underpinning, the following discussion reflects key approaches that can be applied to the qualitative and subjective part of a mixed methodology. For example, ethnography, grounded theory, phenomenology, narrative and discourse analysis, and positivism/ post positivism (Creswell and Poth, 2024; Teherani, Martimianakis, Stenfors-Hayes, Wadhwa and Varpio, 2015).

7.1 ETHNOGRAPHY.

Ethnography is associated with the study of social or cultural groups and is considered to be the earliest qualitative research approach that seeks to understand the culture and cultural setting of a group of people (Goodman, 2013). When associated with a mixed methodology, findings from qualitative data are integrated with quantitative data (Pelto, 2017). The ethnographic researcher engages themselves with others through discussion, interviews, texts, listening and observation (Beaudry and Miller, 2016; Sano and Martin, 2024). They seek to document and understand nonverbal behavior, messages, patterns and relationships within and without the group (Denzin and Lincoln, 2011, Reeves, Peller, Goldman and Kitto, 2013).

7.2 GROUNDED THEORY.

Grounded theory is associated with the systematic collection of literature, data and theory and the iterative/ cyclical analysis of the findings until there is theoretical saturation (Glaser and Strauss, 1967; Strauss and Corbin, 1998). When used within a grounded mixed methodology, the methods used can be integrated with the data that are generated and collected (Grant, 2024). When compared to a single methodological approach a grounded mixed methodology can provide complementary strengths that can result in a grounded theory that is superior (Grant, 2014). Charmaz (2008) adds that the four defining strategies associated with grounded theory are coding, theoretical sampling, theoretical saturation and memo writing. The purpose is to uncover content associated with group behavior and social processes (Crooks, 2001).

7.3 PHENOMENOLOGY.

Phenomenology is used in qualitative research and focuses on the study of human behavior and shared experiences (Braun and Clarke, 2013; Neubauer, Witkop and Varpio, 2019). It seeks to identify and understand how people experience the world around them (Husserl, 1983; Lester, 1999; Moustakas, 1994). It is the study of the lived experience (Van Manen, 2016). Phenomenology can be divided into three categories- 1) Descriptive/ transcendental, 2) Interpretive/ hermeneutic and 3) Critical theory 4) Postmodernism.

Moustakas (1994) explains that descriptive/ transcendental phenomenology is a qualitative approach that seeks to put aside preconceived thoughts and ideas allowing for the true meaning of the experience/ phenomena to emerge. The purpose being is to move beyond everyday assumptions that the researcher may have (Moustakas, 1994; Neubauer, Witkop and Varpio, 2019).

Interpretive/hermeneutic phenomenology is another qualitative approach that combines the descriptive aspect of the research (the lived experience- phenomenology) with the interpretive aspect of the research (the contextual understanding- hermeneutics) (Miles, Francis, Chapman and Taylor, 2013; Ramsook, 2018; Santiago, Brown, Mahmoud and Carlisle, 2020). It is a methodology that describes people as they appear in their average everydayness from which a critique can be made that characterizes a person as a life story or event (Guignon, 2012).

Critical theory, also referred to as critical social inquiry, is used in qualitative research (Bohman, 2001). It argues against the positivist approach and the assumption of the neutrality of the researcher (Ryoo and McLaren, 2010). It seeks to challenge that there is a single truth and aims to appreciate and understand the experiences people have with the purpose of bringing about social change (DePoy and Gitlin, 2016).

Jean-Francois Lyotard (1984) put forward the idea of the postmodern condition describing it as knowledge that is altered as societies enter the postindustrial age (Lyotard, 1984). Developing Lyotard's (1984), view of critical theory,

postmodernism denies that there is a single truth or single objective reality (McCartney, 2023). It is acknowledging that people have the right and the intelligence to decide themselves rather than accepting rules and instructions provided by the church, Government and/or parents (Farhan, 2019). It recognizes that there are alternative ways of thinking- multiple perspectives- and is dependent on the personal and social context of each individual (Muhamba and Francis, 2023; Smith, 2011; Sudartini, 2024).

Within social science, postmodernism can be described as a research methodology that takes into consideration participants' experiences and feelings (Allan, 1997; Dybicz and Hall, 2021; Travers, 2006). It delves into areas such as subjectiveness, imagination, emotions, faith, spirituality and intuition (Hassan, 2003; Holtz, 2020; Kearney, 1998; Lovlie, 1990; Rosenau, 2015).

7.4 NARRATIVE APPROACH AND DISCOURSE ANALYSIS.

The narrative approach can be explained as the study of stories people provide and making sense of their personal experiences. It is a qualitative analysis of how people live their lives (Cowger and Tritz, 2019). It focuses on sources such as biographies, diaries and interviews. For example, semi structured, in-depth interviews can be undertaken, allowing participants to narrate their life stories/ experiences from which stories may emerge (Brannen, 2013; Laslett, 1999; Shacklock and Thorp, 2005). The purpose is to understand cultures, society and people and the way people perceive their past (Elliott, 2005; Bhatt, Rajan and Gamage, 2023).

A discourse analysis is where a study is undertaken of ideologies (Gee, 2025; Johnstone and Andrus, 2024). It focuses on how institutional, political and societal power structures influence social norms and communication (Gee, 2025). It is the study of social meaning and context that is embedded into communication (Cicourel, 1980; Slembrouck, 2019; Van Hulst, Metz, Dewulf, De Vries, Van Bommel and Van Ostaijen, 2025). A discourse analysis is qualitative research into the spoken and written language, body language/ non-verbal clues used between different people and within the social context (Chand, 2025; Manzoor, Saeed and Panhwar, 2019; Putnam and Fairhurst, 2001).

Reflecting on the above examples of qualitative analysis, it is important to understand and appreciate the appropriate approach that is being applied. The qualitative data can then help contextualize findings, helping to provide a broader and deeper understanding of the topic being studied. The next section provides further discussion around the advantages and drawbacks of using a mixed methodology.

8. THE ADVANTAGES/ DRAWBACKS OF USING A MIXED METHODOLOGY.

8.1 ADVANTAGES OF USING A MIXED METHODOLOGY.

When compared with a single methodological approach, a mixed methodology can help provide a more comprehensive picture comparing findings from quantitative data (breadth-

how often, and how many) and qualitative data (depth- how and why) with the intention of increasing levels of confidence and validity (Wisdom and Creswell, 2013).

Mixing quantitative and qualitative studies draws on the strength of each approach being applied and when used together can provide a richer appreciation of the topic (Creswell, 2015; Creswell, Plano Clark, 2011; Bazen, Barg and Takeshita, 2021). It allows flexibility where the researcher can choose the methodological approach(es) being adopted that they consider to be the most helpful. Wisdom and Creswell (2013) also identify several other advantages that include the following.

A mixed methodology can also help understand possible contradictions between findings from quantitative and qualitative data providing a more comprehensive appreciation of that being studied. Findings from qualitative data can give participants voice, ensuring that the study being undertaken is grounded in the participant's experiences.

Findings from small scale quantitative and qualitative can also suggest that fuzzy generalizations can be made across a wider population (Bassey, 2001).

Quantitative data (numbers, statistics, trends, underlying factors) can help answer "*what*" is happening (Blaikie, 2003; De Mesquita and Fowler, 2021; Slater and Hasson, 2024). Findings from qualitative data can then help provide the researcher with added and supportive information providing contextualization to the topic being studied. It allows the researcher to delve deeper into the findings helping to address the reason "*why*" behind human behavior (Fine and Elsbach, 2000; Taylor, Bogdan and DeVault, 2015). Whereas quantitative data is associated with numbers and statistics, qualitative data helps add feelings and nuance providing a human story behind the quantitative data (Austin and Sutton, 2014; Beeson, 1997; Bergin, 2018; Macdonald-Ross, 1977; McLeod, 2025a; Slater and Hasson, 2024; Thorne, 2000).

When compared to a single methodological approach, the combination of quantitative and qualitative data, in a mixed methodology, can help clarify, enhance and elaborate findings while expanding on the breadth and width of the study (Bryman, 2006; Greene, Caracelli and Graham, 1989; Wisdom, Cavaleri, Onwuegbuzie and Green, 2012).

8.2 DRAWBACKS OF USING A MIXED METHODOLOGY.

There are, however, challenges associated with using a mixed methodology. For example, it can be more complex to undertake; it may require more expertise to undertake, analyze and evaluate the findings; it may be more time-consuming; and it may require greater expense (Gov. UK, 2020a; Hafsa, 2019; Halcomb and Andrew, 2009; Wisdom and Creswell, 2013). Criticism is also raised by Tashakkori and Teddlie (2010) who point out that the researcher may place higher status to the findings from quantitative data than qualitative data. Creswell (2011) also raises questions associated with a mixed methodology that includes, how mixed methodology can be defined; is there clear distinction between the terms quantitative and qualitative; can different

approaches be mixed in the first instance and are there too many mixed methodological approaches.

8.3 THE ADVANTAGES/ DRAWBACKS OF USING QUESTIONNAIRES, INTERVIEWS, FOCUS GROUPS AND/OR OBSERVATIONS.

Findings from interviews and questionnaires can have complementary and differing strengths (Adamson, Gooberman-Hill, Woolhead and Donovan, 2004; Harris and Brown, 2010). The advantage of undertaking a questionnaire is that it can be administered anonymously to many people (Patten, 2014; Williams, 2003). Patten (2014) adds that when compared to findings from interviews, findings from questionnaires can be tabulated and scored.

There are drawbacks to using a questionnaire. Once it is sent out, it should not be amended (Juniper, 2009). If amendments or errors are made, the questionnaire should be withdrawn and sent out again. This can add to the time, cost and inconvenience to the researcher and to the participants who may have completed the questionnaire when first sent out. It is, therefore, recommended that a pilot is undertaken first in which the questionnaire is tested (Green 2020; Willis, 2016).

Using one's own social media may reach a selected number of people. However, using online questionnaires can lead to a lower response rate. They may be ignored or forgotten. Possible participants may be inaccessible as there is a reliance on them being connected with the researcher and having access to the internet and access to social media being used (Atayee-Bennett, 2025; Gupta and Bashir, 2018; Keat, Gauhar, Castellani and Teoh, 2023). Another drawback is that the researcher cannot ask clarification or supplementary questions. It is also important to ensure that questions asked are unambiguous and they should be relevant and clear to the participants (Baker 2003).

Interviews can allow for more in-depth and detailed analysis and context that may not be found using a questionnaire (Robinson, 2023). Interviews can help provide context to study where participants may share feelings, emotions and experiences (Chand, 2025; Hutchinson, Wilson and Wilson, 1994; Rutledge and Hogg, 2020; Taylor 2005).

Interviews can also allow the researcher to ask follow up questions and the participant can ask for clarification of questions being asked (Bolderston, 2012; Dunwoodie, Macaulay and Newman, 2023; McLeod, 2024b). When compared to telephone, online and web-based interviews, Deakin and Wakefield (2014) advise that face-to-face interviews are considered to be the gold standard. The researcher can observe the body language and tone of voice of the participant (DeJonckheere and Vaughn, 2019; Denham and Onwuegbuzie, 2013).

Group interviews can be described as focus groups (Bolderston, 2012). They can be undertaken online, telephone and in person that can encourage group interaction that involves discussion, debate and idea sharing among participants (Gov.UK, 2020b). As with face-to-face

interviews, when undertaken in person, body language can be observed. If undertaken by telephone or video conferencing, the researcher can also note tone of voice (Phelan, 2014; Ramos-Lucca, Motta-Pagan, Velez-Mojica, Rodriguez-Torruella, Velez-Maldonado, Rosario-Maldonado, et al, 2025; Shelton and Jones, 2022).

Whereas drawbacks to using focus groups can be mitigated in their design, they can be time consuming (Gammie, Hamilton and Gilchrist, 2017). Not all participants may attend and if they do, conflict, disagreement and arguments may occur (Nyumba, Wilson, Derrick and Mukherjee, 2018; Smithson, 2000). It, therefore, requires skill to be able to organize and control the focus group (Morgan and Spanish, 1984). It is also important to recognize that organizing focus groups can be time-consuming and if undertaken in person participants may require compensation for their time and travel costs (Owen-Smith and Coast, 2017; Wilkinson, 2004). It may not be easy to find a representative sample. For example, consideration needs to be given to factors such as participant's background, gender, age, viewpoints, levels of confidence to speak in front of others.

Undertaking observations in social science is where the researcher immerses themselves in real life settings (Conrad, 2001). Observing can help capture what people actually do rather than relying on what they say (Patterson, Bottorff and Hewat, 2003). It allows for greater understanding and contextualization of how people interact with each other and the environment they are in challenging preconceived ideas and views (Lashley, 2017). This can include observation of body language and tone of voice (Denham and Onwuegbuzie, 2013; Hao and Hood, 2019).

There are challenges associated with observations. In the first instance the observer needs to gain access to the research environment (Lashley, 2017). If there is just one observer, they can only be in one place at one time (Jennings, 2005). Those being observed may be influenced by the observer's presence (Jennings, 2005; Jibril, 2018). This observer effect (Hawthorne effect) could, therefore, invalidate the findings, analysis and evaluation of the study (Monahan and Fisher, 2010). An important consideration when undertaking observations is the need to identify and address ethical factors such as intrusion of privacy, confidentiality, anonymity and informed consent.

9. ETHICAL CONSIDERATIONS.

When undertaking any form of research, it is important to identify, understand and address ethical factors that may be associated with the study. They are there to protect the researcher, the researcher's organization and participants (UKRI, 2025).

Ethical factors include the need to maintain confidentiality and to identify limitations and risk associated with the study (UKRI, 2025). Furthermore, it is important to ensure compliance with legal requirements and transparency in the process of collecting and sharing data (UKRI, 2025; UK Statistics Authority, 2022). As explained by Crow and Wiles (2008), confidentiality and anonymity are central to ethical

considerations when undertaking research in social studies. Any means of personal identification should be avoided. Anonymity is required and where names of people are identified, in feedback, they should be changed (Saunders, Kitzinger and Kitzinger, 2015).

It is also important to gain informed consent where permission is granted by the participant and their organization (Khan, Hussain and Alam, 2021; NHS England, 2023). This requires a consent form to be signed prior to the questionnaire, interviews, focus groups or observations being undertaken.

The dignity, equality, fairness, respect and rights of participants should be respected at all times and participation in the study should be voluntary (Bell and Bryman, 2007; Fisher, 2012; Jacobson, 2007; UKRI, 2025). Lines of accountability and responsibility need to be clearly stated, and any risk of physical or psychological harm should be minimized (McGrath and Whitty, 2018; UKRI, 2025).

Honesty and integrity should be maintained at all times, and that conflict of interest be avoided (Bryman, 2016; Bryman, Stephens and a Campo, 1996; Watts, 2008). Furthermore, it is important that the researcher does not engage in manipulation and deception that may bring themselves and the organization they represent into disrepute (Bonetti, 1998; Fisher and Fyrborg, 1994; Wendler, 2020).

Safeguarding of vulnerable people and those with disabilities need to be considered (Ferreira, Buttell and Ferreira, 2015; Fisher, 2012). For example, participants may have cognitive and/ or physical impairment; they may be reliant on dependents; they may have diminished capacity; they may be below the age of consent (Oates, Carpenter, Fisher, Goodson, Hannah, Kwiatkowski, et al, 2021; Mietola, Miettinen and Vehmas, 2017; Oruche, 2009).

Participation should be voluntary. Participants should be advised accordingly and they should also be able to withdraw at any time (BERA, 2018; Gordon and Prohaska, 2006; Haggerty, 2004; SRA, 2021; UK Statistics Authority, 2022).

10. LIMITATIONS.

When carrying out research in social studies it is important that the researcher not only identifies the limitations associated with the study but also critically examines and identifies their own limitations and limitations in others and the environment in which the study is being undertaken. This section identifies examples of possible limitations.

The researcher should be neutral and unbiased however, bias may occur intentionally or unintentionally (Simundic, 2013). Whereas the term bias can be ambiguous to define, a common explanation is that it refers to systematic errors where deviations may occur from a true measurement, for example, the estimation of a population sample (Hammersley and Gomm, 1997). However, the researcher and participant can be influenced by their age, gender, culture, background, assumptions, personal experience, knowledge and understanding of the world around them (Adikaram, Weerakotuwa and Liyanage, 2022; Berger, 2015; Buetow, 2019; Gever, 2025; Miyazaki and Taylor, 2008). The researcher's interpretation of how they view themselves,

others and the world around them can influence findings. This can also be the case with those participating in the study. They may not even appreciate that they are being biased (Suveren, 2022). This can be described as unconscious bias.

Time constraints may be another limitation. This may limit the number of potential participants that can be approached. Time may be limited in which to assess, evaluate and write up findings (Akanle, Ademuson and Shittu, 2020). There may be inflexible deadlines.

When participants respond to questionnaires the researcher has to rely on self-report (Brutus, Aguinis and Wassmer, 2013). The participant and/or the researcher may not wish to be honest. They may try to influence findings. They may misinterpret or misunderstand the question(s) being asked. The researcher may misinterpret responses. There has to be reliance on the participant and researcher being truthful (Dodd-McCue and Tartaglia, 2010; Van de Mortel, 2008).

11. CONCLUSION.

In conclusion the researcher should carefully consider the methodological approach that is most appropriate to the study. There are advantages and drawbacks no matter what approach is applied. The traditionalists would most likely recommend a single methodological approach. Modernists may be more flexible and undertake a mixed methodology where they compare and contrast findings from different approaches. Notwithstanding the methodological approach that is being applied, ethical considerations need to be included and limitations acknowledged.

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