

Research in a multidimensional world

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The phenomena we study have both qualities and quantities

They can also be assessed in terms of time or space, the sound they make, their colour, or their emotional significance ... they are multidimensional.

We need words and numbers, and perhaps also images and multimedia to record our observations. The method we use does not change an object or experience, but it can change how we recall it, think about it, and what follows on from it.



But, our research world is, largely, a world split into two camps

Qt



Ql

“New People to New Groups” S. Gladen
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The quant-qual divide is our construction, one we impose on the world we study.

Some of 40+ recorded contrasts

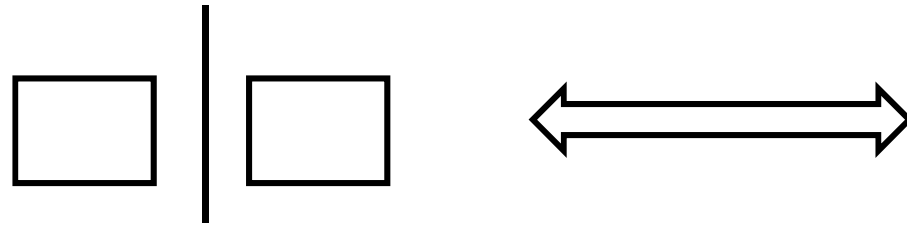
Qualitative

exploratory
process oriented
subjective
natural
unstructured
purposive
researcher
text
flexible
narrative
case-oriented
inductive
generalise to theory

Quantitative

confirmatory
variance focus
objective
controlled
structured
probabilistic
instruments
numbers
fixed
statistics
variable-oriented
deductive
generalise to population

We have divisions; we need dimensions.



If phenomena are multidimensional,
we need multidimensional methods.

Dimensions have no boundaries

We have a sense of and can attempt to describe quant and qual research, but the boundaries are unclear.



Qual and quant are like two interrelated families

(Bergman, *Advances in mixed methods research*. Sage, 2008).

Pond-field metaphor – the boundary is muddy, but you can still identify pond and field (and the mud has value too)



Lack of boundaries implies...

- Using diverse data and methods, while working toward a common purpose or goal
- Selecting data on the basis of what is needed, useful, and available, rather than type, to reflect the multidimensionality of phenomena
- Recognising and ensuring the interdependence of different elements in reaching the goal (think of protein exchange across the DNA double helix)
- Seeing the potential for more complete, but also for possibly conflicting results from our research

“There is only research”

(Gorard and Siddiqui, 2018)

But there is a problem: standard definitions of mixed methods research assume and perpetuate a quant-qual divide

- Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches ... for the broad purposes of breadth and depth of understanding and corroboration. (Johnson, Onwuegbuzie, & Turner, 2007: 123)
- In mixed methods, the researcher
 - Collects and analyses both qualitative and quantitative data rigorously in response to research questions and hypotheses,
 - Integrates (or mixes or combines) the two forms of data and their results ... (Creswell & Plano Clark, 2018: 5)

Historically

- Early 20C (and prior): typically multiple or mixed methods were selected to fit a purpose, without challenge
- Mid 20C: Psychology, education, health studies attempt to emulate natural or clinical sciences, using 'objective' quantitative methods
- Later 20C: Challenges to the 'hegemony of quantitative methods' – development of 'naturalistic' alternative → emphasis on epistemological foundations (what is and what justifies knowledge)
- Late 20C: Mixed methods began to be identified as a specific approach to methodology in the 1980s–90s. Named as a 'third methodological movement' in 2004.

Within the MM community, there was
a rise and fall of epistemological
(paradigm) conflicts



Data as a representation of phenomena

Research transforms phenomena, to make them visible. This involves

- selecting the best form(s) of data to represent each multidimensional phenomenon
- analysing and converting these data into evidence.

Text and numbers (as forms of data) can each be treated as:

- respondents' constructions, to be reinterpreted by the researcher, and/or
- as representing reality, reported descriptively as 'what is'.

Both numbers and words are given meaning through theoretical or culturally-based conventions; each requires interpretation.

Further: warranting a conclusion has more to do with research design than with whether data are recorded as numbers or text.

An alternative definition of mixed methods to represent multidimensional phenomena

Because phenomena are multidimensional, they require

- A form of representation that captures their multiple dimensions, but also
- A perspective in which these build together to represent the coherence of the whole.

Thus:

Mixed methods studies are those in which more than one source or type of data, and/or more than one approach to analysis of those data, are integrated throughout the study in such a way as to become interdependent in reaching a common theoretical or research goal (Bazeley, 2010: 432)

Integration is the essential core of using mixed methods, not what kinds of data are being integrated.

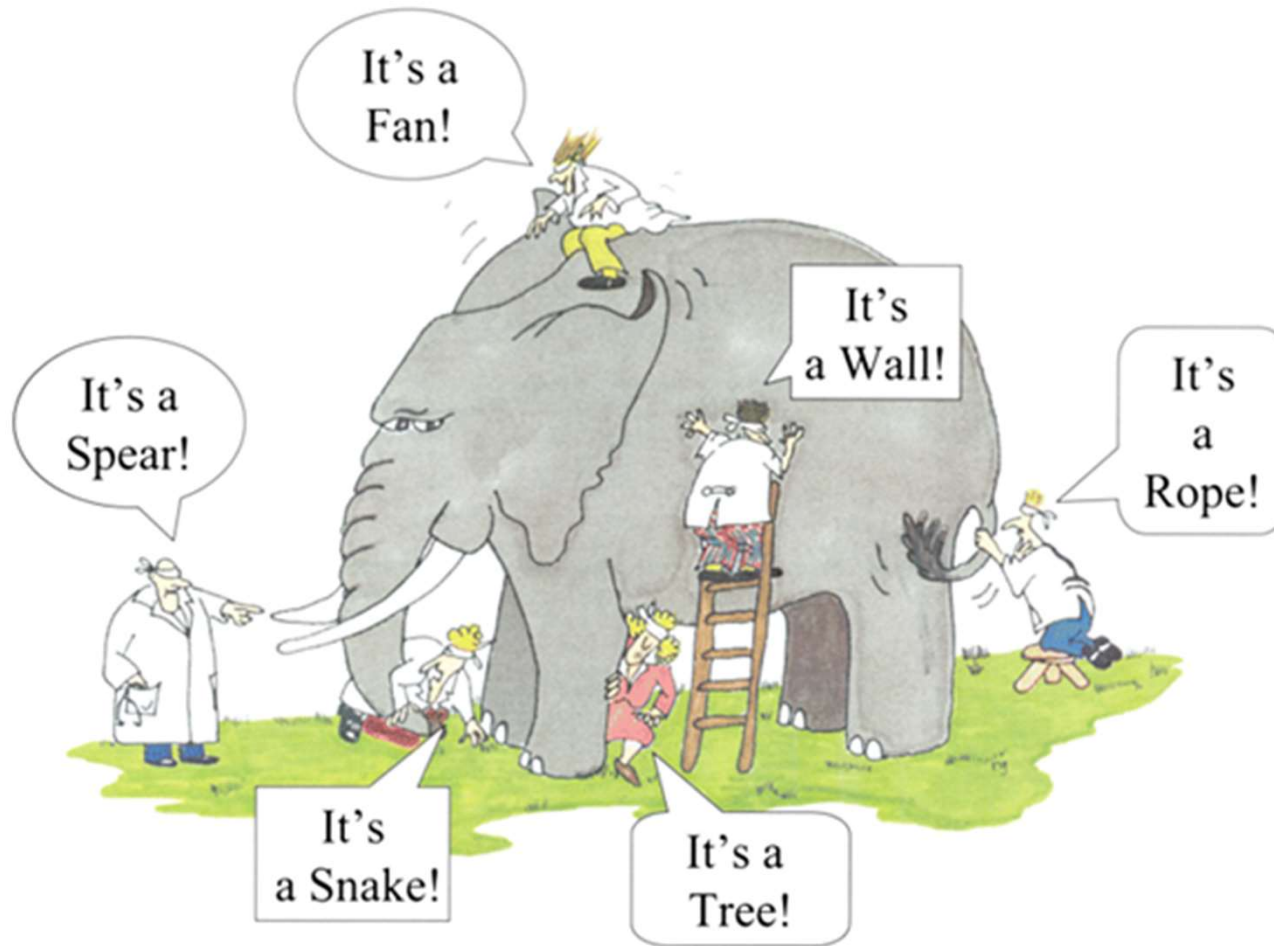
Integration in MM can occur:

- Iteratively, throughout a project, as information and ideas flow from one method to another, often unconsciously
- Deliberately, at 'points of interface' in the design of a project
- Primarily, through data management and analysis
- Reflectively, as all the thoughts prompted by the various data sources are drawn into a coherent set of inferences from the project
- Evidentially, in the recorded results of a study (before the discussion)!

In practice

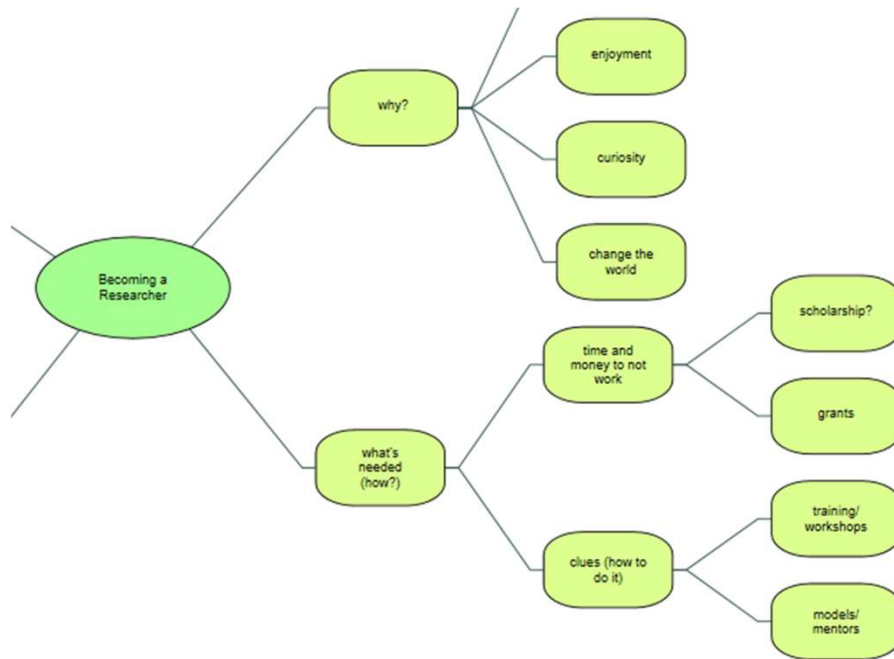
An integrated, multidimensional way of thinking about and doing research means:

- focusing on your research purposes and questions
- exploring the research problem from multiple perspectives
- design, free from constraints on choice of methods
- judging available data by its relevance rather than its form
- analytic integration of methods used
- integrated writing of results as well as conclusions
- and it benefits from use of computer technology.

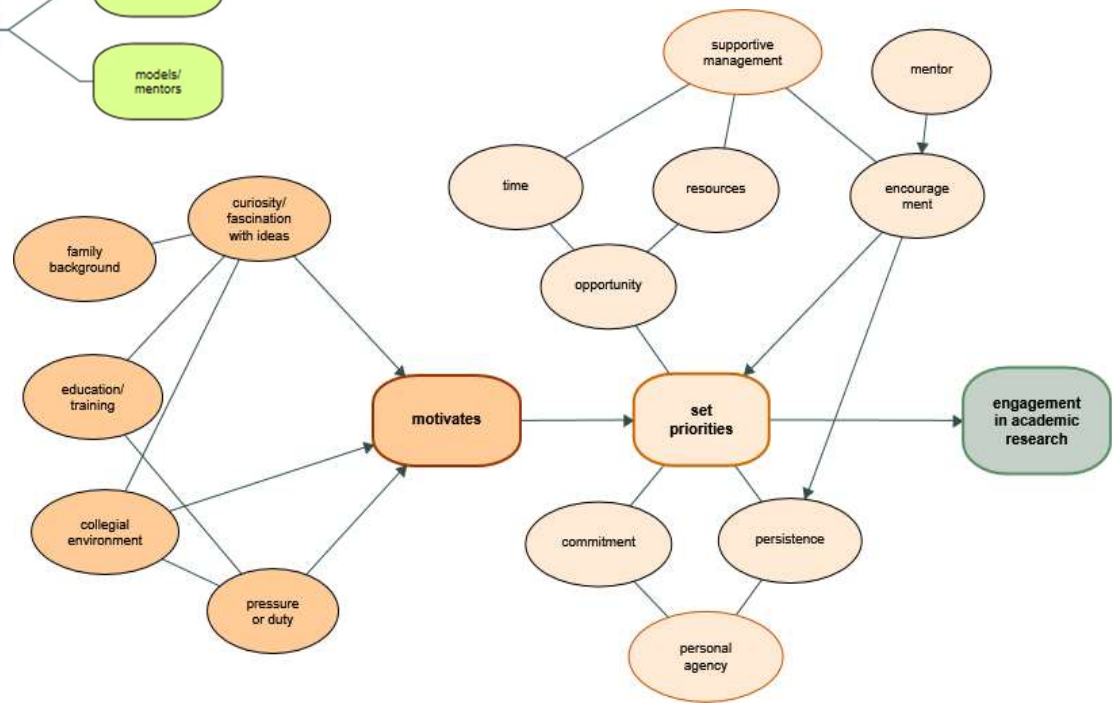


Engage with multiple perspectives
to see multiple dimensions

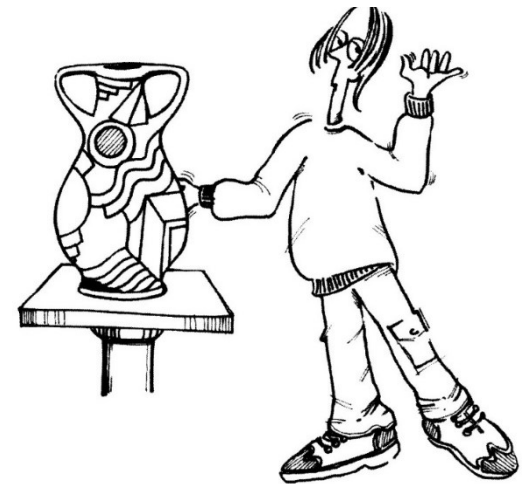
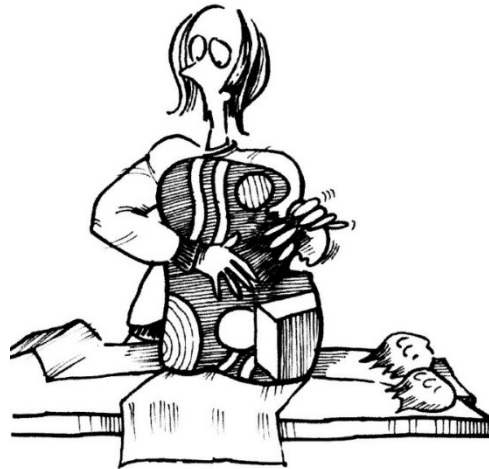
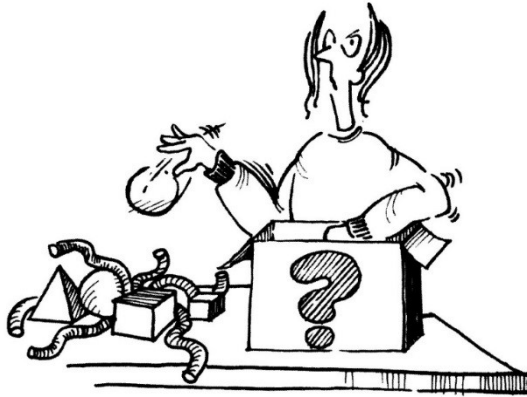
Explore possibilities in a mind map



Map ideas, check assumptions, and determine focus, using a concept map



Design, planning to use
whatever data are
relevant (and
available)



Integrate analyses within and across methods, using software to assist!

- Construct one method based on another
- Combine** in complementary analysis
- Compare** across data types and sources
- Convert** data from one form to another
- Compile using all sources together

But, potentially disrupting integration:

Complexity, Conflict, and Confusion!

Combine varied sources in joint analysis (on paper or ...)



asked, specifically, what they most enjoyed about their children

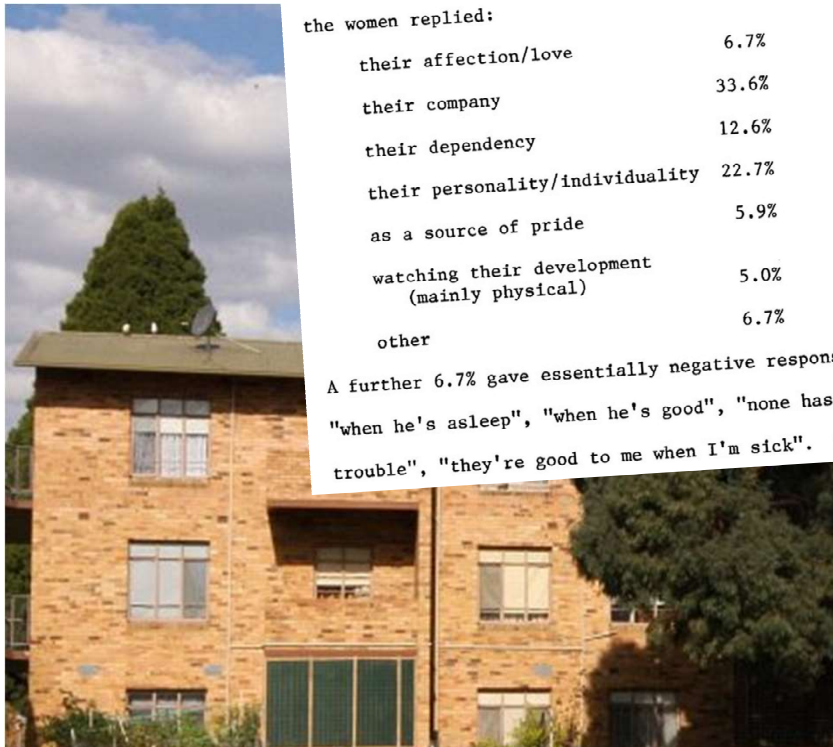
the women replied:

their affection/love	6.7%
their company	33.6%
their dependency	12.6%
their personality/individuality	22.7%
as a source of pride	5.9%
watching their development (mainly physical)	5.0%
other	6.7%

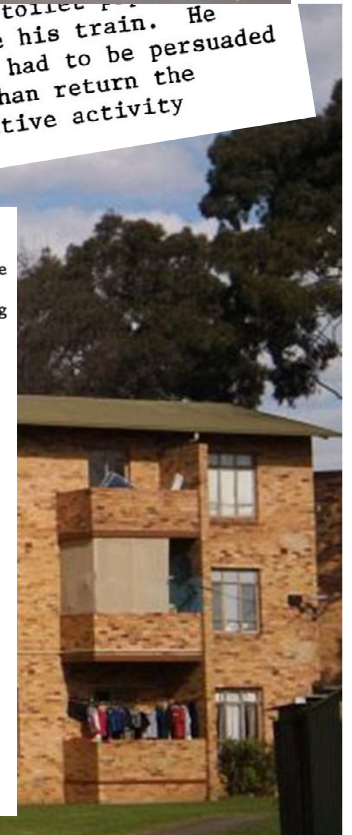
A further 6.7% gave essentially negative responses "when he's asleep", "when he's good", "none has trouble", "they're good to me when I'm sick".

Jimmy, aged 3, was pushing several rolls of toilet paper in the cupboard, along the floor. They were his train. He was enjoying his 'creation', but his mother had to be persuaded to allow him to continue his play, rather than return the rolls to their place. There was no alternative activity to see him in the room at all.

were five families being regularly supervised because of previous neglect of children, two instances of children being before the Children's Court, one of a child receiving supervision following institutional care, and one case of school default (truancy). In addition, there were two applications for an unmarried mother's allowance and one for maintenance by a deserted wife (during the period prior to becoming eligible for a Federally paid benefit), three families with children were evicted from the flats and therefore came to the attention of the Child Welfare Department, one child was exempted from school attendance at 14 years (requiring special concession on grounds of economic or other hardship), and there were five allocations of short-term cash benefits. In all, 14 families (7.8%) of the 180 (of which some were without children) came to the attention of Child Welfare Officers on 21 separate counts. (This analysis has not included



Library membership records indicated that at least one adult member in each of the families in 104 of the 206 flats built before 1971 was a registered borrower. This figure is not very meaningful however because the records could be up to three years out of date. Those flats for which members of two different families were registered were counted only once (15 of them); there are likely to have been several more which



* Text was written in and uses the language of the 1970s

Use QDAS to store data from multiple sources and retrieve from across all those sources for particular codes

The screenshot displays the NVivo 12 Plus software interface. The top menu bar includes File, Home, Import, Create, Explore, Share, and Node Tools. The main window is titled "Wellbeing Phase 1 (NV12 windows).nvp - NVivo 12 Plus".

Left Panel (Navigation):

- Quick Access:** Files, Memos, Nodes.
- Data:** Files, Group discussions, Interviews, Surveys and stats, Videos, Web data, Wellbeing literature, W-W-H freelists etc.
- File Classifications:** Externals.
- Codes:** Nodes, Sentiment, Relationships, Relationship Types.
- Cases:** Cases, Case Classifications.

Center Panel (Nodes):

- Search: being active
- Nodes list:
 - Name
 - Benefits t
 - coordinati
 - group acti
 - Social con
 - System in
 - talking ab
 - W-H dim
 - at pea
 - forwar
 - giving
 - menta
 - perso
 - physic
 - be
 - positiv
 - relatio

Right Panel (Text Excerpts):

- <Files\\Interviews\\Waratah Y> - 5 3 references coded [2.89% Coverage]**
 - References 1-2 - 1.40% Coverage
 - So I think it's that companionship as well and the want to keep fit and healthy
 - Reference 3 - 1.49% Coverage
 - Well, I consider it's a good deal of me coming here that's making me physically fit.
- <Files\\Surveys and stats\\2016 survey report> - 5 1 reference coded [1.25% Coverage]**
 - Reference 1 - 1.25% Coverage
 - Most (32; 76%) exercise for 20 minutes or more several times each week with 9 of those doing so daily. More than half (28; 64%) did so 'yesterday'. Neither was associated with age or length of attendance at OWN. Those who exercised yesterday had significantly better general wellbeing than those who did not (WHO 71:51; p=.001) and tended to experience better general mood (MGMQ).
- <Files\\Wellbeing literature\\Active Ageing. A Policy Framework (WHO: 2002)> - 5 1 reference coded [0.34% Coverage]**
 - Reference 1 - 0.34% Coverage
 - Participation in regular, moderate physical activity can delay functional declines. It can reduce the onset of chronic diseases in both healthy and chronically ill older people. For example, regular moderate physical activity reduces the risk of cardiac death by 20 to 25 percent among people with established heart disease (Merz and Forrester, 1997). It can also substantially reduce the severity of

Bottom Right Panel (Navigation): Summary, Reference, Text, PDF.

Compare qual for quant groups

Using the Crosstab tool to compare ideas about wellbeing contributed by women experiencing different levels of wellbeing - Deepen dimensional understanding of qual; interpret both quant and qual together.

people	WHO grouped = high (9)	WHO grouped = mod (8)	WHO grouped = low (3)	Total (20)
motivation	3	2	3	8
independence	4	0	1	5
self care	3	0	1	4
physical health	5	6	3	14
being active	4	7	2	13
social connection	8	8	3	19
Total (unique)	9	8	3	20

<Files\Interviews\Acacia L> - § 1 reference coded [4.73% Coverage]

Reference 1 - 4.73% Coverage

Women you know we really connect we can tell each other our problems and we don't hide. We become really friendly, like sisters. That's what, I'm really happy, this community.

<Files\Interviews\Acacia V> - § 2 references coded [9.55% Coverage]

Reference 1 - 0.53% Coverage

So I'm socialising, exercising, and out in the fresh air.

Reference 2 - 9.01% Coverage

: Well just getting amongst all the ladies of different nationalities and different ages, and joining in with them in doing things. I've always been like a people person and you know I like to help

Convert for statistical analysis

	forward orientation	at peace, relaxed	personal resources, self	being active	achievement, satisfaction, purpose	social connection
Acacia A	1	2	1	3	0	3
Acacia V	3	0	7	6	1	2
Correa C	4	0	7	0	0	5
Correa P	0	0	1	0	0	6
Correa V	2	1	3	0	1	5
Melaleuca D	2	2	3	4	1	5
Melaleuca L	8	5	0	1	0	5

- Export to SPSS for descriptive statistics, inferential statistical analyses (e.g. t-test, ANOVA, regression), or exploratory cluster analyses – to extend, test, or generalise from the qual data.
- Add to ‘quant’ variable data to create a consolidated database for further statistical analysis.
- Combine code data with variable data to create blended variables and unlock further analyses.

Interpret all statistical analyses in the light of the underlying qualitative data.

Complexity and Conflict

Conflicting results arise from:

- Complexity in the phenomenon – entanglement and/or conflicting foci or ‘cuts’
 - Conflicts from methodological differences
 - Conflicting perspectives in team members
 - Divergent and extreme cases
- Review methods, check theory, return to data, add data, create new (blended) variables, compare +ve and – ve outliers, undertake intensive case analyses, Jackknife regressions
- Unlock analyses, new/enriched understanding

Analytic writing - a key to integration

- Writing during analysis
 - to initiate, reflect on, and deepen understanding
- Integrate multifaceted results (before conclusions)
 - during development
 - design results around issues to be discussed rather than methods
- Journey toward a conclusion to capture the whole
 - telling a story
 - building an argument
 - using an audit/log trail

The 'take-home message'

- Multidimensional phenomena require multi-faceted methods to produce multidimensional data – *think about purpose, data, and method, not whether you are using quant or qual.*
- The data you use need to be integrated to coherently represent an holistic phenomenon.
- Integration occurs throughout a project, but especially during analysis, and it flows through into writing/reporting.
- Integrative processes benefit from use of software.

Key reference for this presentation

Bazeley, P. (2018). “Mixed methods in my bones”: Transcending the qualitative-quantitative divide. *International Journal of Multiple Research Approaches*. 10(1), 334-341. (open source)

See also

Gorard, S., & Siddiqui, N. (2018). There is only research: The liberating impact of just doing research. *International Journal of Multiple Research Approaches*, 10(1), 328-333. (open source)

Sandelowski, M. (2014). Unmixing mixed methods research. *Research in Nursing & Health*, 37(1), 3-8. doi: 10.1002/nur.21570

For other Bazeley references (MM and qual)

Go to: www.researchsupport.com.au



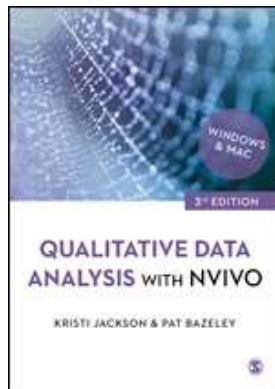
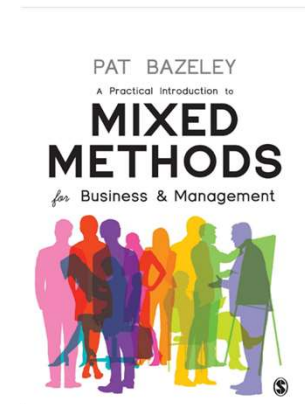
Integrating analyses in MM research (Sage, 2018)

This book goes beyond mixed methods research design and data collection to provide a pragmatic discussion of the challenges of effectively integrating data to facilitate a more comprehensive and rigorous level of analysis. Showcasing a range of strategies for integrating different sources and forms of data as well as different approaches in analysis, it will help you plan, conduct, and disseminate complex analyses with confidence.

A practical introduction to MM (Sage, 2019)

This book introduces the concepts and debates associated with combining methods, and illustrates the many benefits and the hazards of undertaking a mixed methods study by drawing on example studies from across business and management disciplines.

Students and researchers undertaking their own mixed methods research are taken step-by-step through the mixed methods process from developing a mixed methods study, through designing and conducting it, to integrating and reporting on the results.



Qualitative data analysis with NVivo (3e) (Sage, 2019)

This third edition contains fully integrated instructions for using NVivo on both Mac and PC. With screenshots and click-by-click guidance, it seamlessly interweaves theory and practice in easy-to-follow steps. Accompanied by video tutorials for both Mac and PC, this step-by-step book removes students' anxiety about tackling data analysis.