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.

The quant-qual divide is our construction, one we impose on the world we study.
Some of 40+ recorded contrasts

<table>
<thead>
<tr>
<th>Qualitative</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>exploratory</td>
<td>confirmatory</td>
</tr>
<tr>
<td>process oriented</td>
<td>variance focus</td>
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<tr>
<td>subjective</td>
<td>objective</td>
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<tr>
<td>natural</td>
<td>controlled</td>
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<tr>
<td>unstructured</td>
<td>structured</td>
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<tr>
<td>purposive</td>
<td>probabilistic</td>
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<tr>
<td>researcher</td>
<td>instruments</td>
</tr>
<tr>
<td>text</td>
<td>numbers</td>
</tr>
<tr>
<td>flexible</td>
<td>fixed</td>
</tr>
<tr>
<td>narrative</td>
<td>statistics</td>
</tr>
<tr>
<td>case-oriented</td>
<td>variable-oriented</td>
</tr>
<tr>
<td>inductive</td>
<td>deductive</td>
</tr>
<tr>
<td>generalise to theory</td>
<td>generalise to population</td>
</tr>
</tbody>
</table>
We have divisions; we need dimensions.

If phenomena are multidimensional, we need multidimensional methods.
We need to see divisions as dimensions

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

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

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 ...)

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

<table>
<thead>
<tr>
<th>people</th>
<th>WHO grouped = high (9)</th>
<th>WHO grouped = mod (8)</th>
<th>WHO grouped = low (3)</th>
<th>Total (20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>motivation</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>independence</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>self care</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>physical health</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>being active</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>social connection</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Total (unique)</td>
<td>9</td>
<td>8</td>
<td>3</td>
<td>20</td>
</tr>
</tbody>
</table>

<Files\Interviews\Acacia L> - 5 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> - 6 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

<table>
<thead>
<tr>
<th></th>
<th>forward orientation</th>
<th>at peace, relaxed</th>
<th>personal resources, self</th>
<th>being active</th>
<th>achievement, satisfaction, purpose</th>
<th>social connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia A</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<td>3</td>
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<tr>
<td>Acacia V</td>
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<td>1</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

- 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

See also

For other Bazeley references (MM and qual)
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.