WHAT CHARACTERIZES A MIXED METHODS STUDY?

General:
Mixed methods research involves collecting, analyzing, and interpreting quantitative (QUANT) and qualitative (QUAL) data in a single study or in a series of studies that investigate the same underlying phenomenon.

Specifically, there are:
• multiple mixed study designs and ways to combine methods to answer research questions
• multiple methods used to collect QUAL and QUANT data
• multiple ways to analyze QUAL and QUANT data
• multiple approaches to combining and integrating QUAL and QUANT analyses

Furthermore:
Specific disciplines and journals have different expectations and conventions about the appropriate use and publication of QUAL, QUANT and MIXED studies

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GETTING STARTED

The steps involved in developing a MIXED study are essentially similar to the decision steps required for a QUAL or a QUANT study.

However, the process is more complex because of challenges involved in:

1. formulating the mixed research objective(s), rationale and questions
2. deciding mixed study designs and sample recruitment methods
3. deciding appropriate data collection methods to combine
4. devising integrative data analysis strategies
5. furthermore:
   The individual researcher requires both QUAL and QUANT skills and training in MIXED methods
   or
   The research team ideally includes people who contribute different training and expertise in QUAL, QUANT and MIXED methods

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1. Aims and Objectives: WHY USE MIXED METHODS?

It is important to have a legitimate reason (rationale) for mixing methods. **What is the add-on benefit of using a mixed approach?**

For example:
- a new thematic topic that requires explorative research to develop data collection methods
- a complex phenomenon that requires in-depth multilayered and multipart study to expand theory and/or maximize interpretation and understanding
- an innovative way to study an old (entrenched) question
- a way to enhance study recruitment, participation, and sampling
- a way to assess the fidelity of survey questions, study instructions or treatments, and interventions
- an innovative way to resolve inconsistent findings

It is also important to devise and state research questions

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1a. Linking Objectives to Study Content

The study rationale should be reflected in the study objectives and design. This Table links some terms currently used to describe the objectives of mixed method research to basic study content.

<table>
<thead>
<tr>
<th>Term</th>
<th>Study Content and Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangularity</td>
<td>Different methods used to measure the same phenomenon to enhance interpretation and understanding</td>
</tr>
<tr>
<td>Development</td>
<td>Results from one method are used to inform the development of other instruments, instructions, interventions, sample recruitment etc</td>
</tr>
<tr>
<td>Complementarity</td>
<td>Different methods are used to investigate different aspects or dimensions – intention is to obtain convergent evidence</td>
</tr>
<tr>
<td>Initiation</td>
<td>Different methods are used to investigate different aspects or dimensions – but the intention is to obtain divergent information</td>
</tr>
<tr>
<td>Expansion</td>
<td>Different methods are used to investigate different phenomena to expand scope of the study</td>
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1b. MIXED METHODS Research Questions: Some examples

QUANT Questions
- descriptive: e.g., what is the prevalence of A
- comparative: e.g., do X and Y differ in average levels of B
- relationship: e.g., is A associated with B; does A predict B

QUAL Questions
- descriptive: e.g., what does it mean to be A; how is B obtained
- comparative: e.g., how similar is the understanding of A in group X and Y

MIXED Questions
- descriptive: e.g., what is the relation between levels of A and perceptions of B
- comparative: e.g., do the perceptions of A differ between group X and Y depending on treatment outcomes

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### 2. TYPICAL MIXED METHODS STUDY DESIGNS

<table>
<thead>
<tr>
<th>Design Overview</th>
<th>Within Study or Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequential</td>
<td>Methods occur one after the other: e.g., QUAL then QUANT or QUANT then QUAL</td>
</tr>
<tr>
<td>Concurrent (or parallel)</td>
<td>QUAL and QUANT method studies conducted alongside one another. Integration may only occur in the analysis phase or final interpretation</td>
</tr>
<tr>
<td>Integrated</td>
<td>QUAL and QUANT collected concurrently (e.g., within same questionnaire or interview session)</td>
</tr>
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</table>

Other important aspects of the design include decisions about:
  a) the relative weights assigned to QUAL vs QUANT;
  b) the points of intersections between the methods; and
  c) the selection of specific methods.

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2a. MIXED METHODS SAMPLING STRATEGIES

<table>
<thead>
<tr>
<th>Relationship between QUAL and QUANT samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical sampling</td>
<td>The same participants participate in QUAL and QUANT study phases</td>
</tr>
<tr>
<td>Parallel sampling</td>
<td>Different samples for QUAL and QUANT study phases but participants drawn from same population</td>
</tr>
<tr>
<td>Nested sampling</td>
<td>A subset of the entire sample participate in an additional study</td>
</tr>
<tr>
<td>Multilevel sampling</td>
<td>Two or more samples recruited from different levels of the population of interest.</td>
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</tbody>
</table>

Table adapted from Onwuegbuzie and Collins (2007)

These sampling strategies can be used in concurrent and sequential designs

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2a. MIXED METHODS SAMPLING ISSUES

Challenges and Issues

- QUAL: Difficulties of capturing representative samples of qualitative life experiences

- QUANT: Difficulties of obtaining data from a representative sample

- Validity and legitimization (dependability and confirmability)

- Ensuring sufficient sample size within the pragmatic constraints of resources (financial, staff, etc)

- Attrition and/or incomplete information in the different study phases

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3. SELECTION of SPECIFIC MIXTURE of METHODS

For example:

Open- and closed items on one or more questionnaires

Depth and breadth interviewing; Structured and/or open

A priori ad “emergent/flowing” focus group strategies

Standardized tests

Exploratory observations

Issues:

Select methods that provide the best data to answer your research questions

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4. SELECTION of ANALYSIS METHODS

There are multiple analysis strategies for QUANT and QUAL methods – but it is important to attempt to integrate analyzes in MIXED METHODS studies.

Examples of Mixed Analysis Strategies:

- Data reduction: E.g., thematic analysis of open-ended responses and factor analyses of quantitative data.
- Data transformation: E.g., convert quantitative data to narrative codes or convert qualitative data to numerical codes.
- Data correlation: E.g., correlate QUANT with quantified QUAL data.
- Data consolidation: E.g., combine quantitative and qualitative data to create new variables.
- Data comparison: E.g., analyze separately but compare findings.

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5. ACQUIRING SKILLS in MIXED METHODS

- If you decide to use mixed methods, it is important to acquire basic skills in the approach and to acquire in-depth knowledge about the specific methods and procedures that you use.

- If you work with a team, the particular composition of research team should ideally be tailored to the research design and questions (see NIH paper for additional issues about group structure and collaboration).