Mixed Methods Research: A Practical Introduction for Prevention Researchers

Goals for This Presentation

- To provide an introduction to mixed methods (MM) research that considers:
  - How to define MM
  - How to decide to use MM
  - How to plan basic MM designs
  - How to incorporate MM into more complex study designs
  - How to design for quality
  - How to anticipate important contexts for the MM research process
  - How to learn more about MM

What Is Mixed Methods Research?

Quantitative Research

Qualitative Research

Mixed Methods

Example 1

- Wu and colleagues (2011) wanted to understand how smartphones were adopted for clinical communication within a hospital setting.

They gathered quantitative frequency data on smartphone use and qualitative interviews and ethnographic observations. From the data, they developed a comprehensive description of the use and perceived outcomes of the smartphones in two hospitals.
EXAMPLE 2

- Bradley et al. (2012) studied an initiative to improve the primary health care services available in rural Ethiopia. Using quantitative longitudinal data, they monitored the performance of 20 primary health care units for 9 months during the implementation of the initiative.

Using the quantitative results, they identified the units that demonstrated top, most-improved, and low performance and conducted in-depth case studies of these units to identify the factors that might explain the variation in impact of the larger initiative on the units’ performance.

EXAMPLE 3

- Owen-Smith et al. (2010) wanted to measure CAM use among African American individuals with AIDS in a culturally appropriate way. They first conducted interviews with a small number of African American patients with AIDS who identified as CAM users.

From these results, they refined an existing CAM survey instrument to be culturally appropriate. They then administered the refined instrument to a large sample.

The Emergence of Mixed Methods (MM)

- The “field” of MM began in the late 1980s
  - e.g., Bryman (1988) in the UK; Greene, Caracelli, & Graham (1989) and Creswell (1994) in the USA; Morse (1991) in Canada

- Emergence helped by
  - acceptance of quantitative and qualitative research
  - need to address complex problems

- Selected milestones:
  - Name formalized as “mixed methods” (Tashakkori & Teddlie, 2003)
  - First meeting of the International MM Conference (2005)
  - NIH publishes “Best Practices for MM” (Creswell et al., 2011)

Defining Mixed Methods: NIH “Best Practices”

- Mixed methods is a research methodology that:
  - Focuses on research questions that call for real-life contextual understandings, multi-level perspectives, and cultural influences;
  - Employs rigorous quantitative research assessing magnitude and frequency of constructs and rigorous qualitative research exploring the meaning and understanding of constructs;
  - Uses multiple methods (e.g., intervention trials and in-depth interviews);
  - Intentionally combines these methods to draw on the strengths of each;
  - Frames the investigation within philosophical and theoretical positions.

* SOURCE: Creswell et al. (2011)
Defining Mixed Methods: Core Characteristics

- **The researcher:**
  - Collects and analyzes both quantitative and qualitative data;
  - Mixes the two forms (a) concurrently by combining them, (b) sequentially by having one build on the other, and/or (c) embedding one within the other;
  - Gives priority to one or both forms to address the purpose;
  - Uses the procedures in a single study or in multiple stages of a program of inquiry;
  - Frames the procedures within philosophical worldviews and theoretical lenses; and
  - Combines the procedures into specific research designs that direct the plan for conducting the study.

* SOURCE: Creswell & Plano Clark (2011)
### Deciding to Mix Methods

- Both methods are needed to address the research questions; one method alone is inadequate
  - Do not want to miss opportunity for a more complete understanding
  - Do not want to miss opportunity of asking the right research questions

### Value for Mixing in Intervention Research

- Understanding culture/context through qualitative methods
- Identification/development/ modification of:
  - Culturally salient constructs/ variables
  - Culturally sensitive theoretical models
  - Culturally appropriate research tools
  - Culturally tailored interventions
  - Evaluation to examine efficacy, feasibility, acceptability, effectiveness

- Scholars argue:
  - Intervention research is enhanced by adding qualitative methods
  - Validity of intervention research is questionable if qualitative methods have not played a substantive and meaningful role

**Sources:** Nastasi et al. (2007); Nastasi & Schensul (2005); Sandelowski (1996); Song et al. (2010)

### Reasons for Mixing Methods

- To develop a more complete understanding of a topic
- To describe both process and outcomes
- To obtain greater validity through triangulation of different approaches
- To illustrate quantitative results with qualitative data
- To increase the credibility and/or utility of findings
- To describe contextual understandings along with generalized findings
- To generate and test theory/hypotheses
- To develop an appropriate instrument, program or intervention
- To explain processes or mechanisms behind quantitative results
- To understand unexpected results

**Sources:** Bryman (2006); Greene et al. (1989); Plano Clark (2010)

### Planning Basic Mixed Methods Designs

- Mixed methods designs are distinguished by different dimensions for how the QUAN and QUAL strands relate to each other
- Analytic logic
  - Independent, Interactive
- Timing
  - Concurrent, Sequential
- Priority
  - Equal, Unequal
- Point of interface
  - Design, data collection, analysis, interpretation
- Scope
  - Single study, multiphase program of inquiry
Three Basic Designs

Concurrent Parallel Design

Quan Strand

Merge Results

Draw conclusions

Qual Strand

Sequential Explanatory Design

Quan Strand

Connect to next phase

Qual Strand

Connect two sets of results and draw conclusions

Sequential Exploratory Design

Qual Strand

Connect to next phase

Quan Strand

Connect two sets of results and draw conclusions

Concurrent Parallel Design: QUAN + QUAL

Quan Strand

Merge Results

Draw conclusions

Qual Strand

• Reasons to Use
  - Develop a complete picture by synthesizing multiple facets
  - Develop valid conclusions by comparing results from different methods
  - Generate new variables during analysis
  - Describe perspectives of participants at different levels of a system

• Prototypical Features:
  - Quan, Qual independent
  - Concurrent timing
  - Equal priority
  - Mix by merging results during analysis

Concurrent Parallel Design

Quan Strand

Merge Results

Draw conclusions

Qual Strand

CONCURRENT PARALLEL EXAMPLE:
Wu et al.’s (2011) Study to Understand Smartphone Use for Clinical Communication in Hospital Settings

• 4 medical teams at 2 hospitals
• Smartphone use (12,936 emails; 13,717 calls)
• Purposeful sampling
• 31 in-depth interviews (MDs, residents, nurses, & allied health professionals)
• 72.3 hours of observations
• Descriptive statistics (M, SD) of communication volume, frequency, and patterns
• Interviews transcribed and analyzed for themes
• Fieldnotes reviewed for themes and communication events tabulated
• Integrated the QUAN + QUAL results to provide comprehensive and representative insights across the multiple methods
• Interpreted QUAN and QUAL results to advance a model of effects of communication changes based on combined results

SOURCE: Creswell & Plano Clark (2011)
Advantages

- Intuitive approach
- Efficient design, particularly if can only interact with participants once
- Implementation works well with teams (although a challenge when it comes to the mixing of two sets of results)

Challenges

- Need to carefully plan parallel data collection protocols if aim to compare two sets of results
- Determining participants and sample sizes
- Developing procedures such as a joint matrix for merging two sets of results, and deciding what to do if results do not agree

Example of a Joint Matrix to Compare and Synthesize Results

SOURCE: Allor et al. (2006, Table 2, p. 366)

Sequential Explanatory Design: QUAN → qual

Prototypical Features:
- qual dependent on QUAN
- Sequential timing
- QUAN priority
- Mix by connecting from QUAN results to qual data collection
  - Use QUAN results to inform the qual research questions, sampling, and data collection protocols

Reasons to Use
- Identify quantitative relationships/differences/trends and explain why these results occurred
- Qualitatively study best participants (who need to be identified using quantitative results)
**Sequential Explanatory Example:**
Bradley et al.’s (2012) Study to Explain
Factors Associated with Variable Impact of Systems-Based Initiative

**Advantages**
- Useful when have guiding theory and appropriate instruments at start
- Two-phase approach straightforward to implement
- Clear decisions to be made at the point of interface:
  - Qual research questions
  - Qual sampling
  - Qual data collection protocol development

**Challenges**
- Need to be able to return to some participants
- Implications for informed consent and what data need to be collected
- Negotiating approvals since qual phase needs to be responsive to QUAN results
- Specifying which QUAN results to explain
  - Significant/non-significant differences or predictors
  - Outliers, extreme, or typical cases
- Connecting two sets of results

**Example of a Joint Matrix to Explain Group Differences**

**SOURCE:** Bradley et al. (2012, Table 1, p. 4)
Sequential Exploratory Design: **QUAL → quan**

**Prototypical Features:**
- quan dependent on QUAL
- Sequential timing
- QUAL priority
- Mix by connecting from QUAL results to quan data collection
  - Use QUAL findings to inform the quan variables, research questions, and data collection instruments

**Reasons to Use**
- Develop an emergent theory/typology and assess its prevalence or test the theory/typology
- Qualitatively characterize a construct to inform the identification of a variable and/or development of an instrument for QUAN study

**Advantages**
- Usefull when variables, theories, hypotheses not known or need a culturally appropriate instrument
- Clear decisions to be made at the point of interface:
  - Quan variables/constructs
  - Quan hypotheses
  - Quan instrument/program development
- Different participants for each phase, which can facilitate approval process
- Research often includes developing a product (instrument, intervention)

**Challenges**
- Developing and pilot testing an instrument is always a challenge
- Difficult to specify procedures for quan phase when initially applying for human subjects approvals
- Staying true to the qualitative results throughout the second, QUAN phase

**Example of a Joint Matrix to Connect QUAL Results to the Development of a QUAN Instrument**

**SOURCE:**
Crede & Borrego (2013, Table 2, p. 69).
Incorporating MM into More Complex Designs

- More and more researchers are intersecting MM with other frameworks:
  - MM and QUAN Experiments
  - MM and QUAL Case Studies
  - MM and Program Development and Evaluation
  - MM and Action Research
  - MM and Transformative Approaches

EXAMPLE: Intersecting MM with an RCT

- Interpretive qualitative methods embedded within an RCT

EXAMPLE: Intersecting MM and Intervention Research

- Multiphase, recursive mixed methods approach to program development and evaluation

SOURCE: Nastasi et al. (2007, Figure 1, p. 166)

Designing MM for Quality

- Strong rationale for why MM is needed to address the problem and study aims
- Rigorous approach
  - Well planned and articulated study design (timing, priority, purpose)
  - Good quantitative and qualitative methods (consistent with their respective established standards)
  - Clear description of when and how integration will occur and how integrated results will lead to new insights

SOURCES: Creswell et al. (2011); O’Cathain (2010); O’Cathain et al. (2008)
Anticipating Important Contexts for MM

- **Personal Contexts**
  - Do you have the necessary training and skills to successfully conduct MM and if not, how will you obtain them?
  - In what ways do your theoretical and methodological perspectives support (or hinder) the use of MM?
  - Is MM feasible for your time, budget, and resources?

- **Interpersonal Contexts**
  - How will the use of MM affect study participants (Burden? Benefit?)
  - What ethical implications relate to your use of MM?
  - Who in your team has expertise in: QUAN? QUAL? Mixing?
  - How will team members work together effectively?

- **Social Contexts**
  - What is the status of MM in your field?

SOURCES: Creswell et al. (2011); Plano Clark (2010)

Learning More about MM

- **Great Resources on the Web:**
  - NIH’s Best Practices for Mixed Methods Research in the Health Sciences (http://obssr.od.nih.gov/mixed_methods_research)
  - RWJF’s Qualitative Research Guidelines Project (http://www.qualres.org/)

- **Recommended Books:**
  - Creswell & Plano Clark (2011). Designing and conducting mixed methods research
  - Greene (2007). Mixed methods in social inquiry
  - Teddlie & Tashakkori (2009). Foundations of mixed methods research
  - Tashakkori & Teddlie (2003, 2010). Handbook of mixed methods in social & behavioral research
  - Plano Clark & Creswell (2008). The mixed methods reader

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