

Mixed Methods Research: A Practical Introduction for Prevention Researchers

VICKI L. PLANO CLARK, PhD
UNIVERSITY OF CINCINNATI
vicki.planoclark@uc.edu



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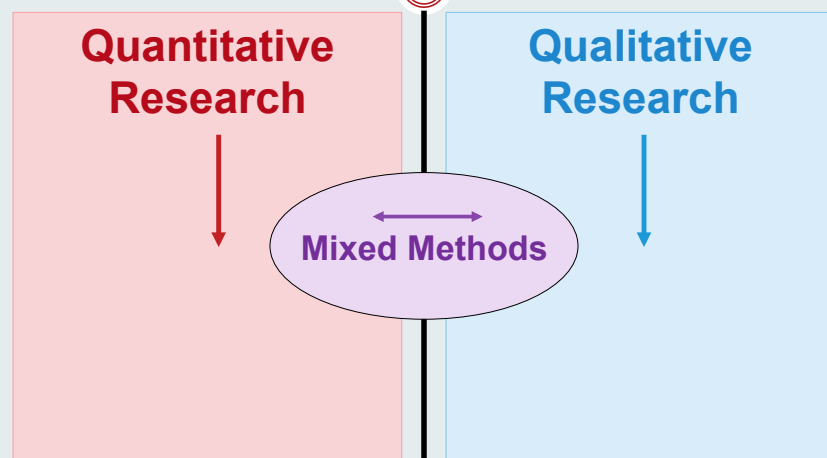
Goals for This Presentation

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- 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?

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EXAMPLE 1

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- 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

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- 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

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- 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)

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- 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)
 - Debut of the *Journal of Mixed Methods Research* (2007)
 - NIH publishes “Best Practices for MM” (Creswell et al., 2011)

Defining Mixed Methods: NIH “Best Practices”

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- **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

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• 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)

MM Involves Different Approaches

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	Quantitative Research	Qualitative Research
Research Goal	<ul style="list-style-type: none"> • Measurement • Determining associations • Theory testing 	<ul style="list-style-type: none"> • Understanding • Description • Theory development
Focus	<ul style="list-style-type: none"> • Several constructs/variables 	<ul style="list-style-type: none"> • A central phenomenon
Research Process	<ul style="list-style-type: none"> • Fixed and linear • Experiment, Survey, etc. 	<ul style="list-style-type: none"> • Iterative and emerging • Ethnography, Grounded theory, etc.
Emphases	<ul style="list-style-type: none"> • Objectivity • Generalizability • Cause-and-effect claims 	<ul style="list-style-type: none"> • Reflexivity • Meaning • Culture and contexts

MM Involves Different Methods

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	Quantitative Research	Qualitative Research
Participants	<ul style="list-style-type: none"> • Representative sampling • Large samples • Random assignment 	<ul style="list-style-type: none"> • Purposeful sampling • Small samples • Natural setting
Data Collection	<ul style="list-style-type: none"> • Closed-ended forms: <ul style="list-style-type: none"> • Instruments • Behavioral checklists • Records • Physiological measures 	<ul style="list-style-type: none"> • Open-ended forms: <ul style="list-style-type: none"> • Interviews • Observations • Documents • Audio-visual materials
Data Analysis	<ul style="list-style-type: none"> • Primarily deductive • Statistical analyses of scores 	<ul style="list-style-type: none"> • Primarily inductive • Descriptive and thematic analyses of text and images

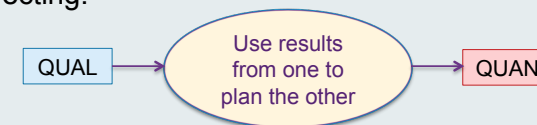
MM Involves Mixing the Approaches & Methods

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• By merging:



• By connecting:



✦ SOURCE: Creswell & Plano Clark (2011)

Deciding to Mix Methods

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- 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

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- 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

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- 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)

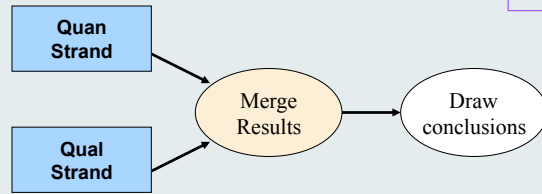
Planning Basic Mixed Methods Designs

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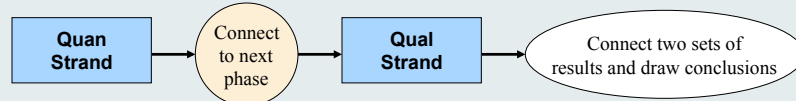
- Mixed methods designs are distinguished by different dimensions for how the QUAN and QUAL strands relate to each other
 - **Analytic logic**
 - Independent, Interactive
 - **Timing**
 - Concurrent, Sequential
 - **Priority**
 - Equal, Unequal
 - **Point of interface**
 - Design, data collection, analysis,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

Concurrent Parallel Design

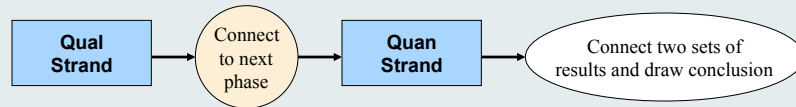
Three Basic Designs



Sequential Explanatory Design



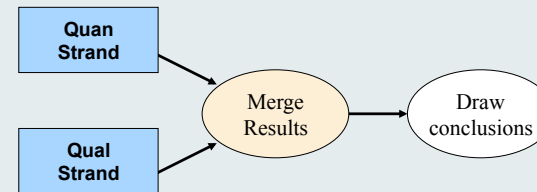
Sequential Exploratory Design



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SOURCE: Creswell & Plano Clark (2011)

Concurrent Parallel Design

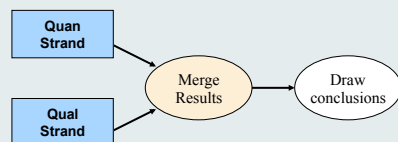


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SOURCE: Creswell & Plano Clark (2011)

Concurrent Parallel Design: QUAN + QUAL

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Prototypical Features:

- Quan, Qual independent
- Concurrent timing
- Equal priority
- Mix by merging results during analysis

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

CONCURRENT PARALLEL EXAMPLE:

Wu et al.'s (2011) Study to Understand Smartphone Use for Clinical Communication in Hospital Settings

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- 4 medical teams at 2 hospitals
- Smartphone use (12,936 emails; 13,717 calls)

QUAN data

QUAL data

- 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

QUAN analysis

QUAL analysis

- 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

Merged results & interpretation

- Interpreted QUAN and QUAL results to advance a model of effects of communication changes based on combined results

Concurrent Parallel Design: QUAN + QUAL

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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

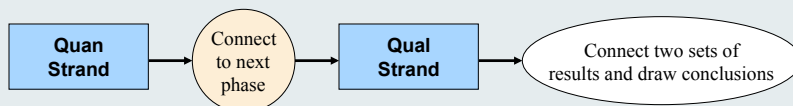
- Need to carefully plan parallel data collection protocols if aim to compare two sets of results
- Determining participants and sample sizes
- Developing procedures such as a joint matrix for merging two sets of results, and deciding what to do if results do not agree

Example of a Joint Matrix to Compare and Synthesize Results

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

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Sequential Explanatory Design



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SOURCE: Creswell & Plano Clark (2011)

Sequential Explanatory Design: QUAN → qual

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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

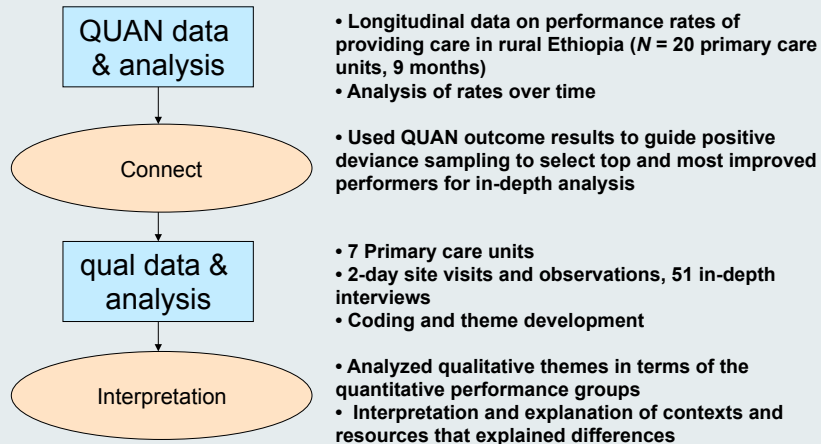
Reasons to Use

- 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

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Sequential Explanatory Design: QUAN → qual

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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

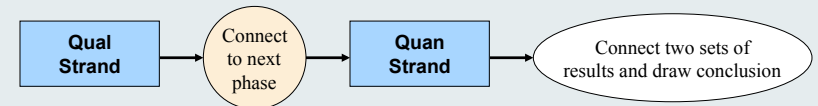
Challenges

- 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



Sequential Exploratory Design: QUAL → quan

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• Prototypical Features:

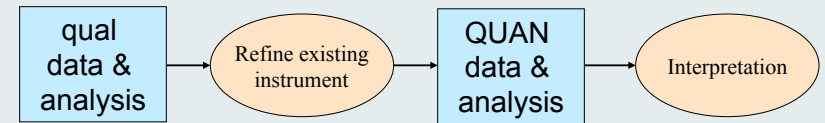
- quan dependent on QUAL
- Sequential timing
- QUAL priority
- Mix by connecting from QUAL results to quan data collection
 - ✦ Use QUAL findings to inform the quan variables, research questions, and data collection instruments

• 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

SEQUENTIAL EXPLORATORY EXAMPLE: Owen-Smith et al.'s (2010) Study to Explore and Measure CAM Use for African Americans with AIDS

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- Purposeful sampling of information rich individuals (N = 35)
- 5 focus groups
- Content analysis

- Use qual results to refine instrument content
- Develop table of items deleted, changed, unchanged, and added

- N = 182 African Americans with AIDS
- CAM survey & demographics
- Scale reliability, factor analysis, and hypothesis testing

- Discuss extent to which qualitative dimensions were validated and the appropriateness of the refined instrument for the specific study population

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Sequential Exploratory Design: QUAL → quan

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Advantages

- Useful 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

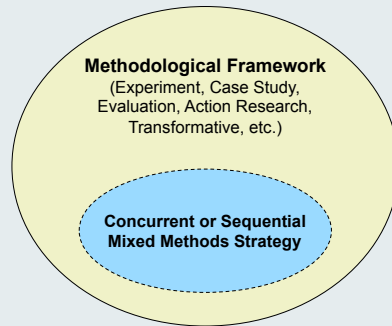
SOURCE:
Crede & Borrego (2013, Table 2, p. 69).

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Incorporating MM into More Complex Designs

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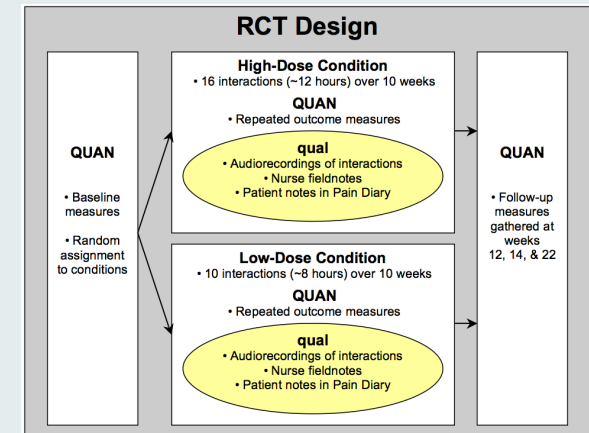
- More and more researchers are intersecting MM with other frameworks:
 - MM and QUAN Experiments
 - MM and QUAL Case Studies
 - MM and Program Development and Evaluation
 - MM and Action Research
 - MM and Transformative Approaches



EXAMPLE: Intersecting MM with an RCT

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- Interpretive qualitative methods embedded within an RCT



- SOURCE: Plano Clark et al. (2013, Figure 2, p. 231)

EXAMPLE: Intersecting MM and Intervention Research

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- Multiphase, recursive mixed methods approach to program development and evaluation
- SOURCE: Nastasi et al. (2007, Figure 1, p. 166)

Designing MM for Quality

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- 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

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- **Personal Contexts**
 - Do you have the necessary training and skills to successfully conduct MM and if not, how will 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

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- **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*
 - Morse & Niehaus (2009). *Mixed methods design: Principles and procedures*
 - 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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