

Mixed Methods Research Designs

Sarah A Stoddard, PhD, RN

October 26, 2016

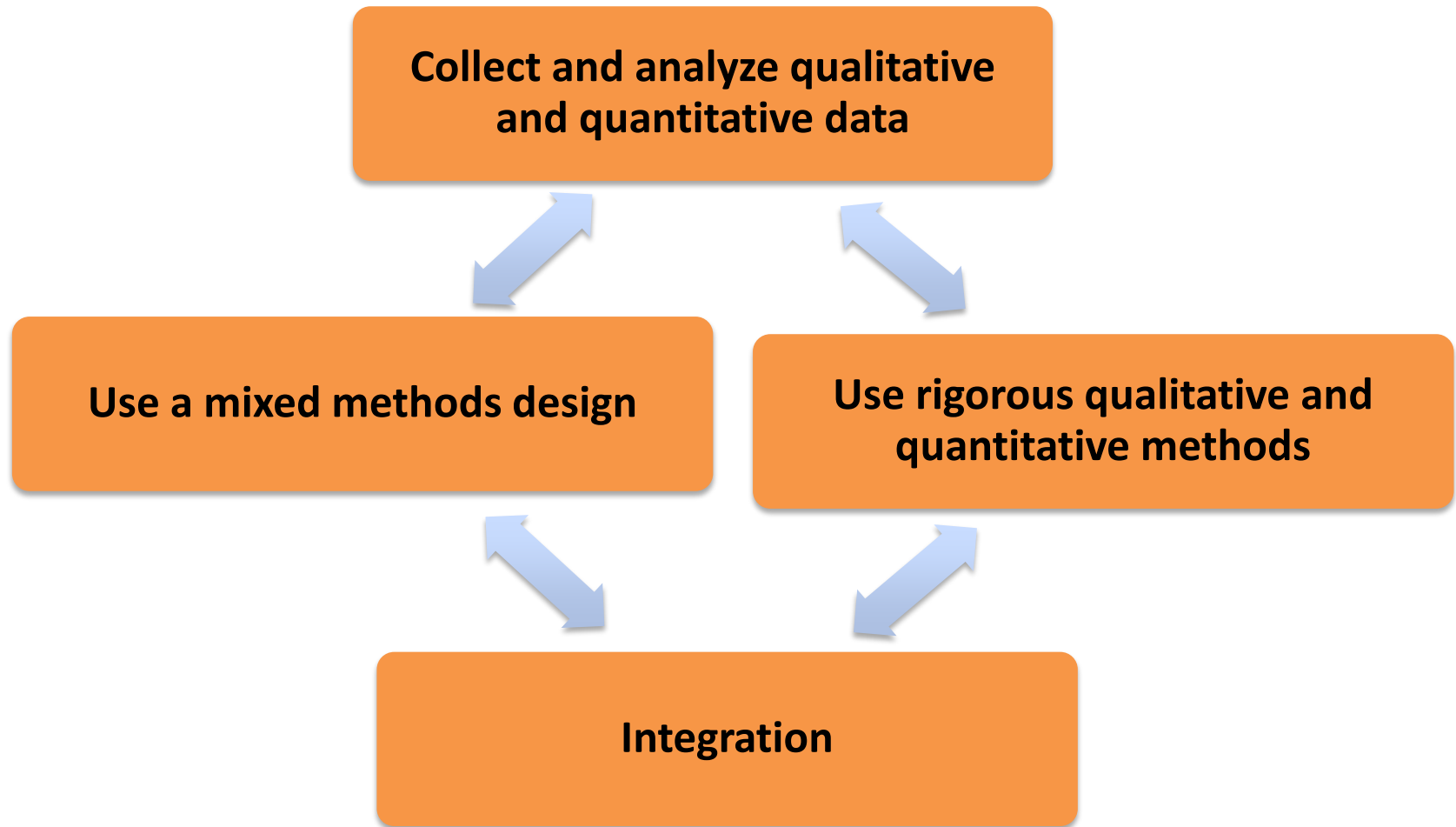
Definition of Mixed Methods

A research approach or methodology:

- focuses on research questions that call for real-life contextual understanding, 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;
- utilizes multiple methods (e.g., intervention trials and in-depth interviews);
- intentionally integrates or combines these methods to draw on the strengths of each; and
- frame the investigation within philosophical and theoretical positions.

Core characteristics of a rigorous mixed methods study

Frame the design with a philosophy or theory



Mixed methods research means “mixing” quantitative and qualitative data

Quantitative

Qualitative



Why do mixed methods research?

- Combine the strengths of qualitative data and quantitative data to answer complex research questions
- Generate a better understanding of the phenomenon than either approach alone

Intent and Nature of Research

Quantitative

- Measure a phenomenon
- Test theories a priori
- Reduces phenomenon to a singular reality
- Deductive or “top down”

Qualitative

- Explores a phenomenon
- Generate theories
- Embraces multiple realities
- Inductive or “bottom up”

Quantitative methods are suited to measure
“known” phenomena, patterns of association,
inferences of causality.

"How many?" "How often?" "What size?"

"What is the association between ____ and ____?"

"If _____, then _____"?

"Is _____ more effective than _____?"

Qualitative research methods are ideal to identify previously unknown processes, explanations of why and how phenomena occur, and the range of their effects.

"What meanings do patients/providers give to _____?"

"What patterns exist?"

"What is important?"

"What are provider/patients values regarding _____?"

Data Sources

Qualitative Approaches

- Narrative Research
- Phenomenology
- Grounded Theory
- Ethnography
- Case Study

Data Sources – Open-ended

- Unstructured or semi-structured interviews
- Unstructured, semi-structured observations
- Documents
- Audio-visual materials
(e.g. photos, videos)

Data Sources

Quantitative- Close-ended

- Surveys
- Instruments
- Observational checklists
- Registries, databases
- Medical charts
- Biological markers
- Medical tests

Data Collection

Quantitative

- Collects numbers
- Seeks breadth from many participants and sites
- Emphasizes generalizability, reproducibility, control,
- Pre-determined processes and procedures

Qualitative

- Collects words and images
- Seeks depth from fewer participants and settings
- Emphasizes unique perspectives of individuals
- Iterative procedures

Data Analysis

Quantitative

- Numerical statistical analysis: descriptive and inferential
- Reject or fail to reject hypotheses
- Determine effect size
- Does not require team for analysis

Qualitative

- Text or image analysis
- Analyzes and codes the data for description and themes
- Generate hypotheses or explanations
- Requires team analysis

Methodological Advantages

Quantitative

- Test known variables
- Seek to generalize from sample to population
- Describe broad trends
- Assess magnitude and intensity of relationships
- Determine impact of an intervention

Qualitative

- Identify unknown variables
- Adapt variables to local context
- Describe participants' experiences in their own words
- Examine contextual factors that are associated with a phenomenon
- Describe details and complexity of a situation
- Improve recruitment efforts

Mixed methods can be used to...

- Generate hypotheses (qualitative) and test hypotheses (quantitative)
- Comprehensive understanding of magnitude (quantitative) AND nature of phenomenon (qualitative)
- Describe outcomes (quantitative) AND process (qualitative)
- Increase confidence in qualitative or quantitative findings
- Develop outcomes for an instrument when one is not available or needs adaptation (qualitative)
- Gather information to inform intervention or implementation (qualitative)

General Steps in Designing a Mixed Methods Study

Preliminary Considerations

- Philosophy or theory
- Resources (e.g., time, financial resources, skills)
- Research problems and reasons for using mixed methods

General Steps in Designing a Mixed Methods Study

- State study aims and research questions that call for qualitative, quantitative, and mixed methods, and that incorporate your reasons for conducting a mixed methods study
- Determine your methods of quantitative and qualitative data collection and analysis
 - When it will be collected
 - What emphasis will be given to each
 - How they will be integrated or mixed
- Select a mixed methods design that helps address your question and the data collection/integration procedures

Mixed Methods Designs

- 3 Core Designs
 - Exploratory Sequential
 - Explanatory Sequential
 - Convergent
- Advanced Applications
 - Multistage
 - Intervention
 - Case Study
 - Participatory
 - Instrument Development

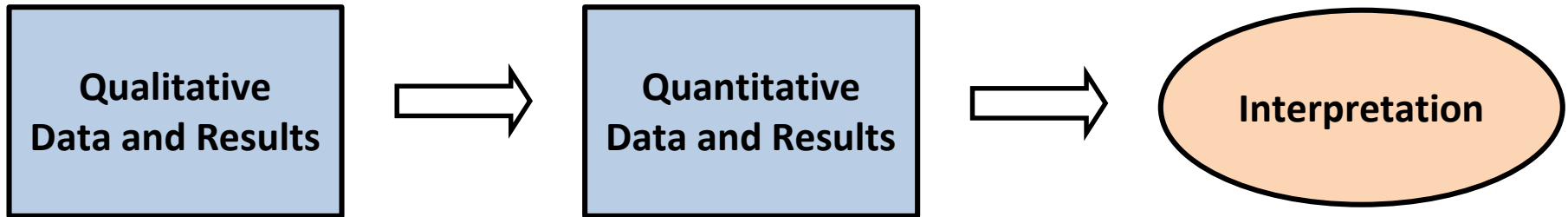
Differences in Mixed Methods Designs

- Timing
- Priority
- Point of interface
- Single study vs. multiphase program of inquiry

Core Mixed Method Designs

- Exploratory sequential design
- Explanatory sequential design
- Convergent design (or concurrent design)

Exploratory Sequential Design



Exploratory Sequential Design

Applications

- To *explore* and identify variables to study quantitatively when these variables *are not known at first*
- To cognitively test instruments prior to a study
- To develop a theory or model first, then test it
- To develop a classification or typology to test quantitatively

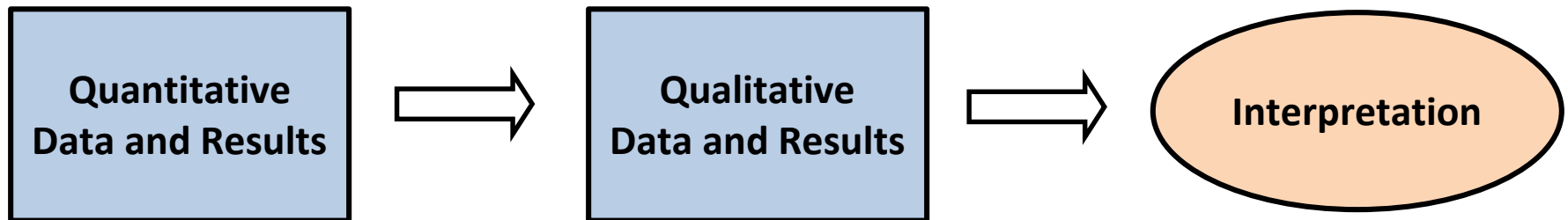
Exploratory Sequential Design Example

Study Aim: To examine patients' readiness to discuss psychosocial problems with nurses during diabetes consultations.

Methods: In-depth interviewed (n = 12) about patients' experiences 

Development and implementation of a structured questionnaire (n = 205).

Explanatory Sequential Design



Explanatory Sequential Design

Applications

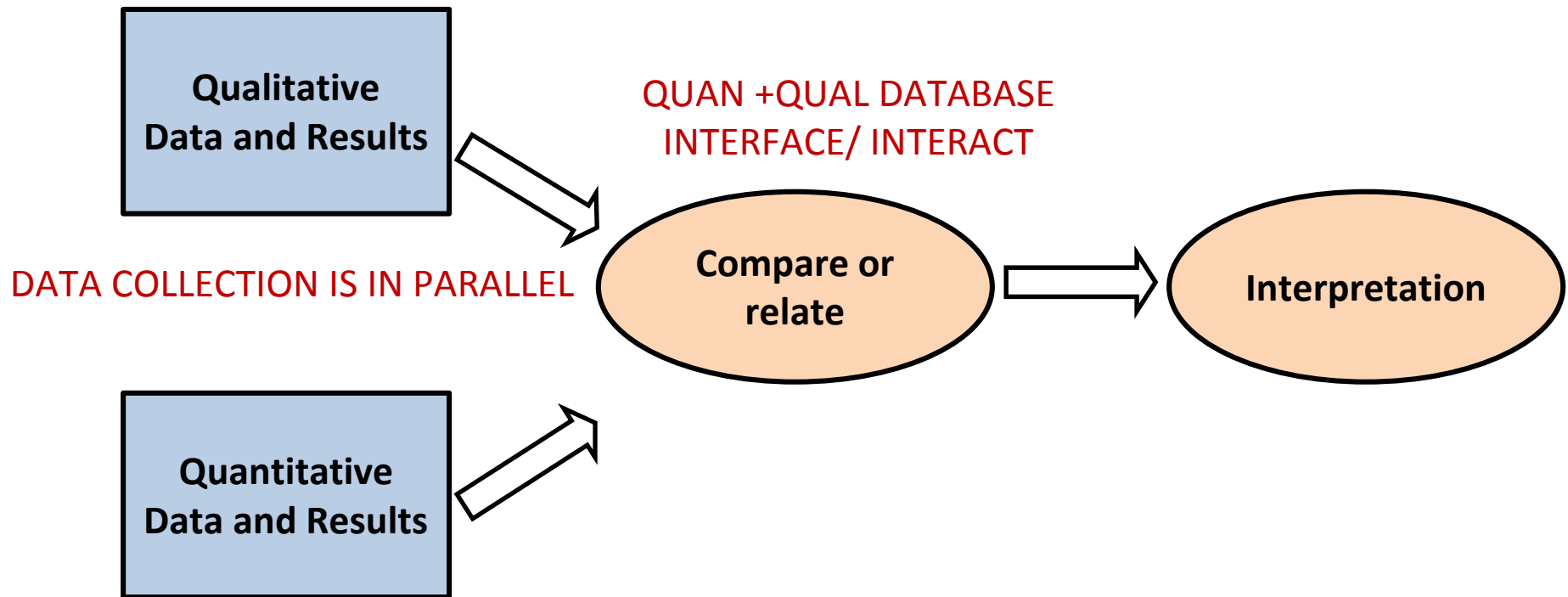
- To explain the quantitative results in more depth with qualitative data
 - Null findings
 - Outliers
 - Enrollment patterns
- To identify appropriate participants to study in more depth qualitatively
 - Smaller subsamples (e.g. minority group)
 - Surprising findings

Explanatory Sequential Design Example

Study Aim: determine the health -related quality of life (HRQoL) and its determining factors; and to describe the life experiences of women with coeliac disease.

Method: Survey (n = 1097)

Convergent Design



Convergent Design

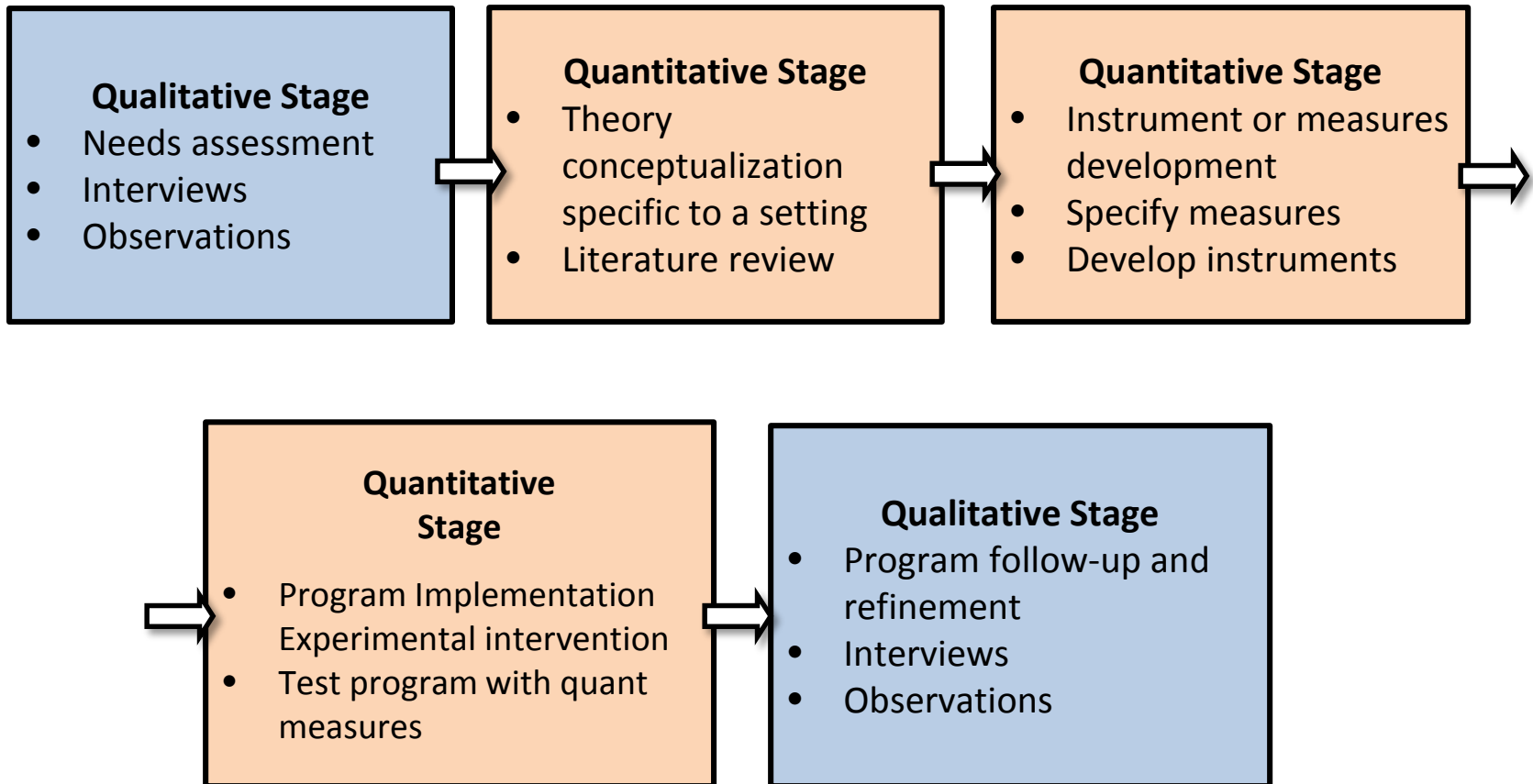
Application

- To acquire breadth of understanding (quantitative) with depth of understanding (qualitative)
- To validate or explain quantitative findings with qualitative data collected contemporaneously
- To expand your quantitative findings with some open-ended qualitative data (e.g., survey with closed- and open-ended data)

Advanced Frameworks

- Multistage
- Intervention
- Social justice or Transformative
- Case study
- Participatory
- Instrument

Multistage Evaluation Design Example



Intervention Design

- Conduct an experiment or intervention – adding qualitative data
- QUANITATIVE is Central
- Qualitative data are collected primarily to:
 - Support the development of the intervention (*before* intervention)
 - Understand contextual factors and/or processes *during* the intervention that could affect the outcome
 - Explain results *after* the intervention is completed
 - May involve any combination of the above

Participatory Advanced Frameworks

- Perspectives and voices of individuals in the target population are included in the research
- Participation is active and reciprocal
- Addresses inequities, disparities, social injustice
- Focus is to empower marginalized populations
- Ex: Community-based participatory research

Case Study Mixed Methods Framework

- Case is the focus of the study
- Both qualitative and quantitative data are collected to build a comprehensive understanding of the case
- Draws from multiple tradition, including medicine
- Comparative case studies are an extension of this framework

Instrument Design Framework

- Builds on exploratory sequential design
- Collect qualitative data first, followed by building the instrument, then collecting quantitative data to test the instrument
- Combines qualitative inquiry, quantitative inquiry and measurement/psychometrics

Integration Principles

- Intentionally combine the quantitative and qualitative data
- **Goal is** to maximize the strengths of the quantitative and qualitative data and minimize their weaknesses
- **Goal is not** to separately collect qualitative and quantitative data that never interface, interact, integrate

Integration through Data collection and Data analysis

- Explaining or connecting (Explanatory Sequential)
- Building (Exploratory Sequential)
- Merging (Convergent)
- Embedding

Source: Fetters, Curry, & Creswell (2013)

Integration through Connecting

Purposely selecting the qualitative follow-up sample based on the individuals who provided unexpected survey responses

Explanatory Sequential Design

Phase 1

Quantitative
Data Collection
and Analysis



Explained
by or
sampled by



Phase 2

Qualitative
Data Collection
and Analysis



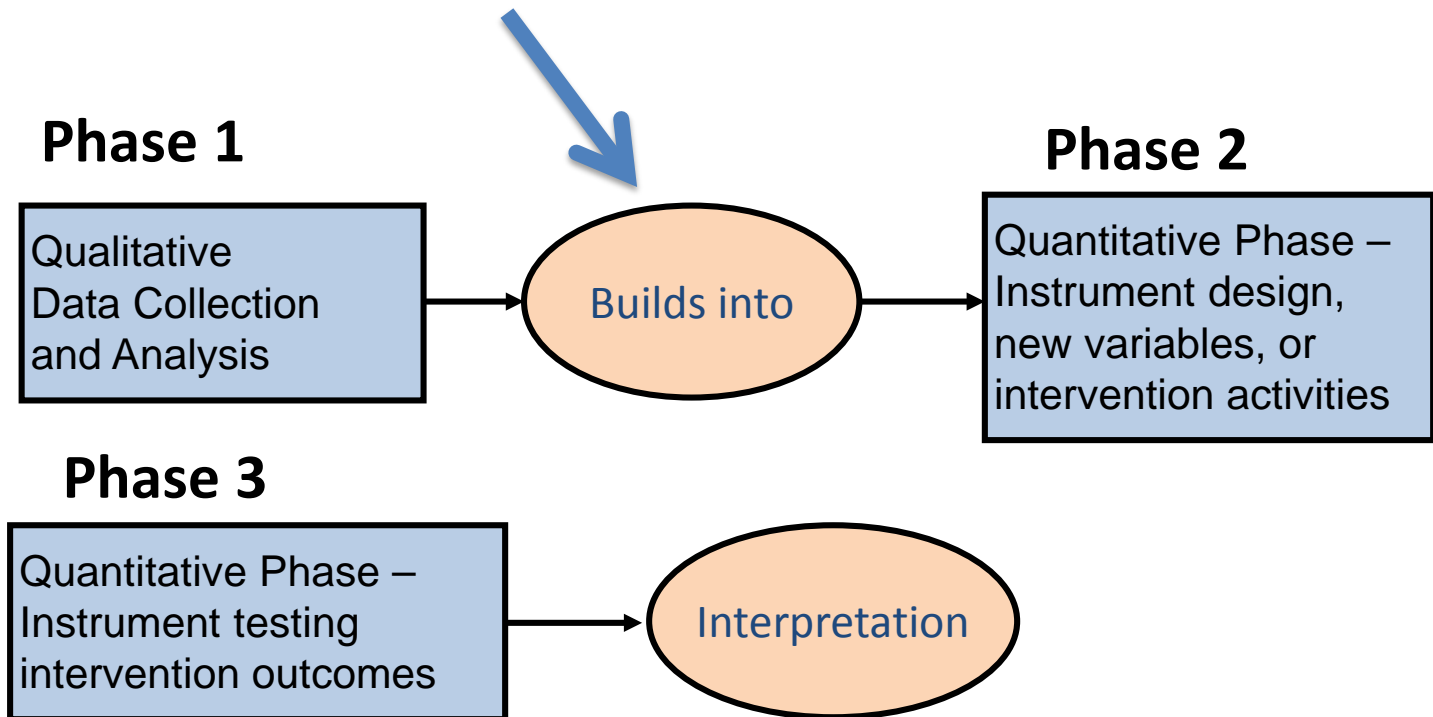
Interpretation



Integration through Building

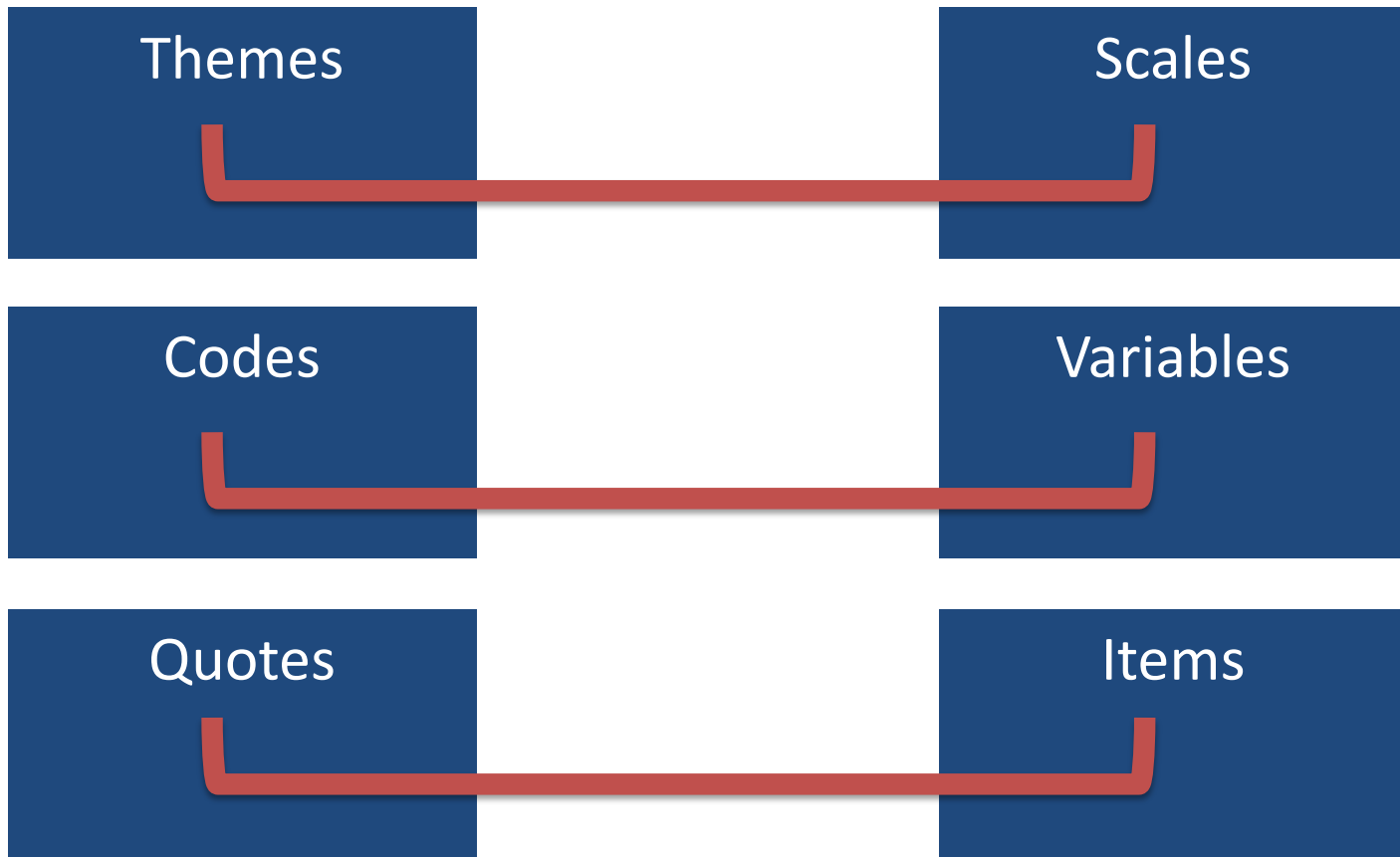
The results of one component informs the data collection of the other.

Exploratory Sequential Design



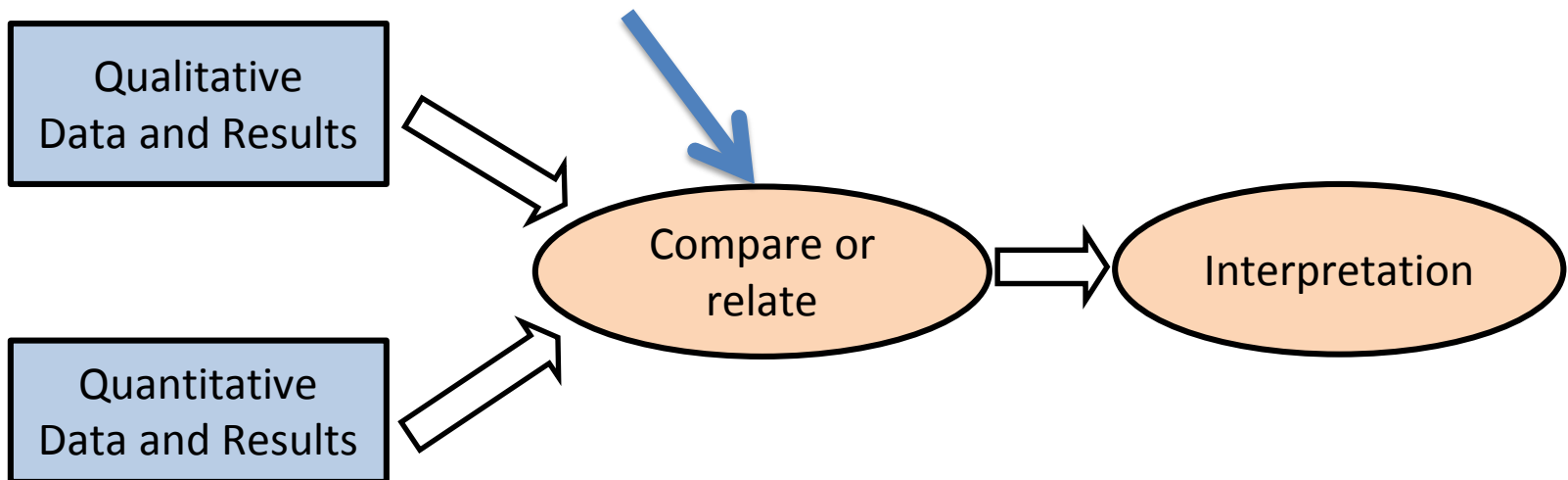
Building

Going from qualitative findings to a quantitative instrument



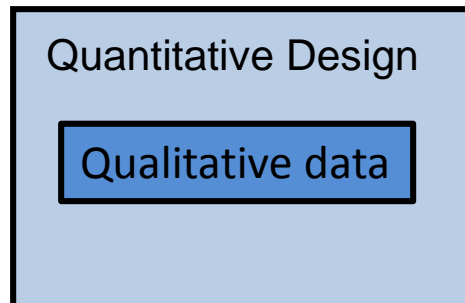
Merging

- Qualitative and quantitative results are brought together and compared
- Convergent design



Embedding

- Qualitative data are used to augment or support quantitative data
- Embedding (or nesting) is often found in an intervention design



Research Question Examples

- Separate QUAL & QUAN questions
 - “Is there a statistically significant difference in nursing student empathy, as measured by the Interpersonal reactivity Index, after a psychiatric nursing experience?”
 - What are student perceptions of working with mentally ill clients during a clinical rotation?
 - *Need to be clear how you would integrate the analysis of the two and why learning both is important*



Research Question Examples

- Have an overarching MM question
 - “How do the perspectives (QUAL) of adolescent boys support the results that their self-esteem changes (QUAN) during middle school years?”
- State a hybrid MM question
 - “Does participation in the Fullbright Teacher exchange program impact the intercultural competence of participants? (QUAN) If so, how?(QUAL)

Write a mixed methods research question

Take a couple minutes and think about a mixed method question in your specialty area.

Sample Script of Explanatory Sequential Design

This study will address _____ (content-aim of the study). An **explanatory mixed methods design** will be used, and it will involve collecting _____ in order to _____ on the quantitative data in more depth. In the first quantitative phase of the study, _____ instrument data to be collected from _____ (participants) at _____ (research site) to test _____ (the theory) that explains why _____ independent variables) relate to the _____ (dependent variables). The second qualitative phase will be conducted because _____ (intent of the qualitative phase). In this exploratory follow-up, the _____ (central phenomenon) will *be tentatively explored* with _____ (participants) at _____ (the research site). The reason for the exploratory follow-up is to _____ (e.g., to *help explain or build upon initial quantitative results*).

Sample Script of Exploratory Sequential Design

This study addresses _____ (content-area of the study). The purpose of this **exploratory sequential design** will be to _____ (e.g., *develop an test an instrument, generate a taxonomy*). The first phase of the study will be a *qualitative exploration* of _____ (the central phenomenon) by collecting _____ (types of data) from _____ (participants) at _____ (the research site). The second quantitative phase will *follow up on the qualitative phase* for the purpose of _____ (intent of this followup). In the quantitative phase, _____ (instrument data) will be collected from _____ (participants) at _____ (research site). Quantitative research questions/hypotheses will be formulated after the completion of the initial qualitative phase. The reason for collecting qualitative data initially is that _____ (e.g., *instruments are not available, variables are not known, there is little guiding theory*).

Sample Script for a Convergent Design

This mixed methods study will address _____ (overall content-aim of the study). A **convergent mixed methods design** will be used, and it is a type of design in which _____.

In this study, _____ (*quantitative instruments*) will be used to _____ of _____ (the theory) that predicts that _____ (independent variables) will influence _____ (positively, negatively) the _____ (dependent variables or outcomes) for _____ (participants) at _____ (the research site). Concurrent with this data collection, qualitative _____ (*t* _____) will _____ (the central phenomenon) for _____ (participants) at _____ (site). The reason for collecting both quantitative and qualitative data are to _____ to _____ (e.g., compare results, validate results, corroborate results).

Summary

- Mixed Methods is a natural approach to decisions, inquiry, and research
- 3 Core Designs: Exploratory Sequential, Explanatory Sequential, Convergent Design
- Integration is central feature of MMR
 - Merging, Building, Explaining

References

- Creswell, J.W., Klassen, A.C., Plano Clark, V.L., Smith, K.C. (2010). *Best Practices for mixed methods research in the health sciences*. Office of Behavioral and Social Sciences Research.
- Creswell, J.W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks, CA: Sage Publications, Inc.
- Creswell, J.W., & Plano Clark, V.L. (2011). *Designing and conducting mixed methods research (2nd Ed.)*. Thousand Oaks, CA: Sage Publications, Inc.
- Feters MD, Curry LA, Creswell JW. Achieving integration in mixed methods designs – principles and practices. *Health Serv Res*, 48(6 Pt 2): 2134-56, 2013



For more information:
Sarah A. Stoddard, PhD
University of Michigan School of Nursing
Department of Systems Leadership and Effectiveness Science

Email: sastodda@umich.edu or
researchteam@pathways4youth.org
Visit us at <http://pathways4youth.org>

