Mixed Methods Research

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Mixed Methods Research

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Mixed Methods Research

Reference

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Mixed Methods Research

- Definition
  - "as a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone."

Mixed Methods Research

- Characteristics of mixed methods research
  - Collect and analyze both quantitative and qualitative data.
  - Mix two forms of data in different ways.
  - Give priority to one or both forms of data.
  - Can be in a single study or in multiple phases of a study.

Mixed Methods Research

- Strength and weakness of quantitative and qualitative methods.

	Quantitative	Qualitative
Strength and weakness	Generalization	
	Large sample	Small sample
		details, in depth

Mixed Methods Research

- Why use mixed methods
  - One data resource may not be enough;
  - Initial results need to be further explained;
  - A second method is needed to enhance a primary method;
  - The project has multi-phases.

Mixed Methods Research

- How to choose an appropriate mixed methods design?
  - Level of interaction between two strands: independent or interactive.
  - Relative priority: equal/unequal priority
  - Timing: concurrent, sequential, or combination of those two
  - Where or how to mix the strands: point of interface and mixing strategies

Mixed Methods Research

- Point of interface: is a point where the two strands are mixed: possible point of interfaces
  - Data collection: quan or qual results build to the subsequent collection of qual or quan data.
  - Data analysis: transform one type of data into other type of data and analyze combined data.
  - Interpretation: comparing or combining results from both methods.

Mixed Methods Research

- Examples
  - Similar results from different perspectives: collect data on quantitative instrument and on qualitative data based on focus groups.
  - Collect quantitative data first and follow up with interviews to help explain their outcomes from quantitative data.

Mixed Methods Research

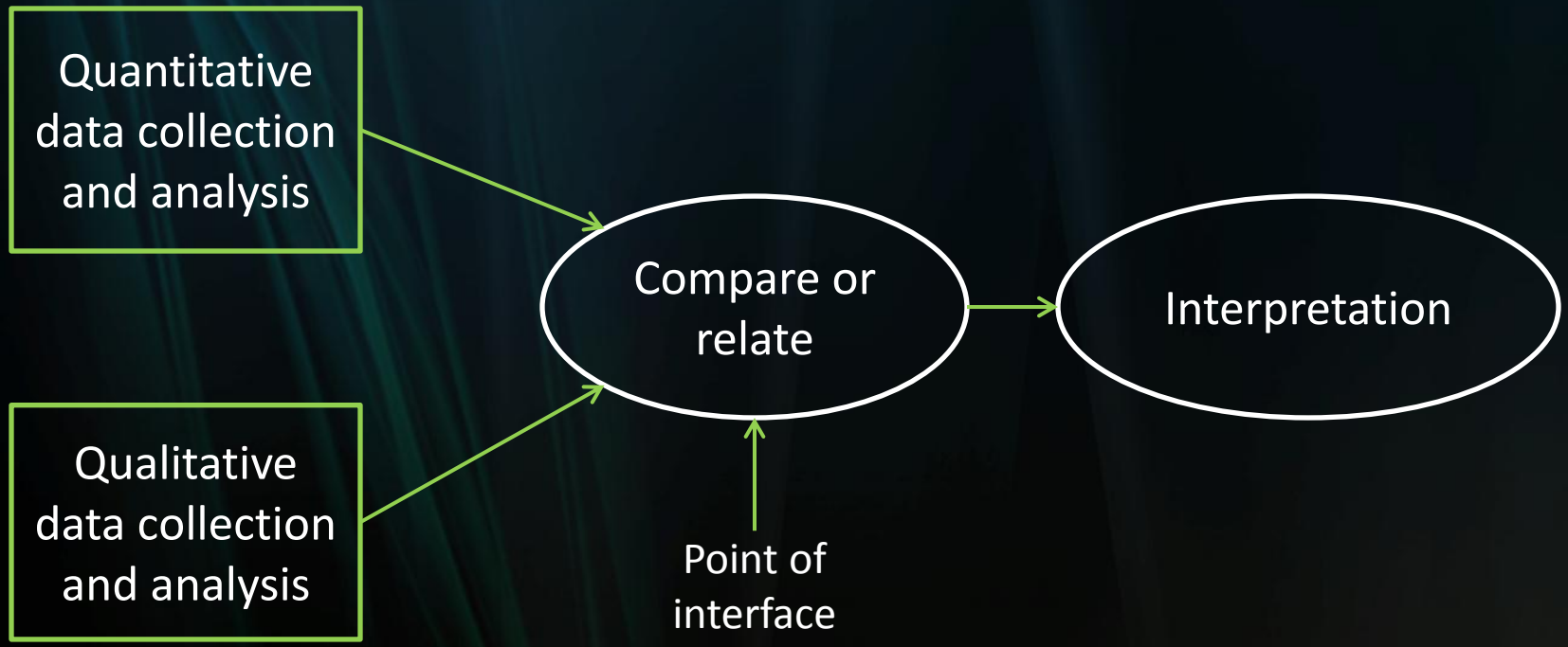
- Examples
  - Use interviews to explores how individuals describe a topic and use the findings to develop quantitative data collection instrument.

Mixed Methods Research

- Major designs
  - (1). Convergent parallel design: purpose of this design
    - to best understand or develop more complete understanding of the research problem by obtaining different but complementary data.
    - Validation purpose

Mixed Methods Research

- Convergent parallel design (diagram)



Convergent Parallel Design

- Three published papers
  - Sherrilene Classen, Ellen DS Lopez, Sandra Winter, Kezia D Awadzi, Nita Ferree, et al. **Population-based health promotion perspective for older driver safety: Conceptual framework to intervention plan.** *Clinical Interventions in Aging* 2007, 2:677-693 *03 January 2007* *http://www.dovepress.com/population-based-health-promotion-perspective-for-older-driver-safety--peer-reviewed-article-CIA*

Convergent Parallel Design

- Three published papers
  - David F. Feldon and Yasmin B. Kafai. **Mixed methods for mixed reality: understanding users' avatar activities in virtual worlds.** *Educational Technology Research and Development 2008 56:575-593* http://www.springerlink.com/content/g66m160n75444mx7/fulltext.pdf

Convergent Parallel Design

- Three published papers
  - Marsha N. Wittink, Frances K. Barg, and Joseph J. Gallo. **Unwritten Rules of Talking to Doctors About Depression: Integrating Qualitative and Quantitative Methods.** *Ann Fam Med 2006 4:302-309; doi:10.1370/afm.558 .* http://www.annfammed.org/content/4/4/302.full.pdf+html

Convergent Parallel Design

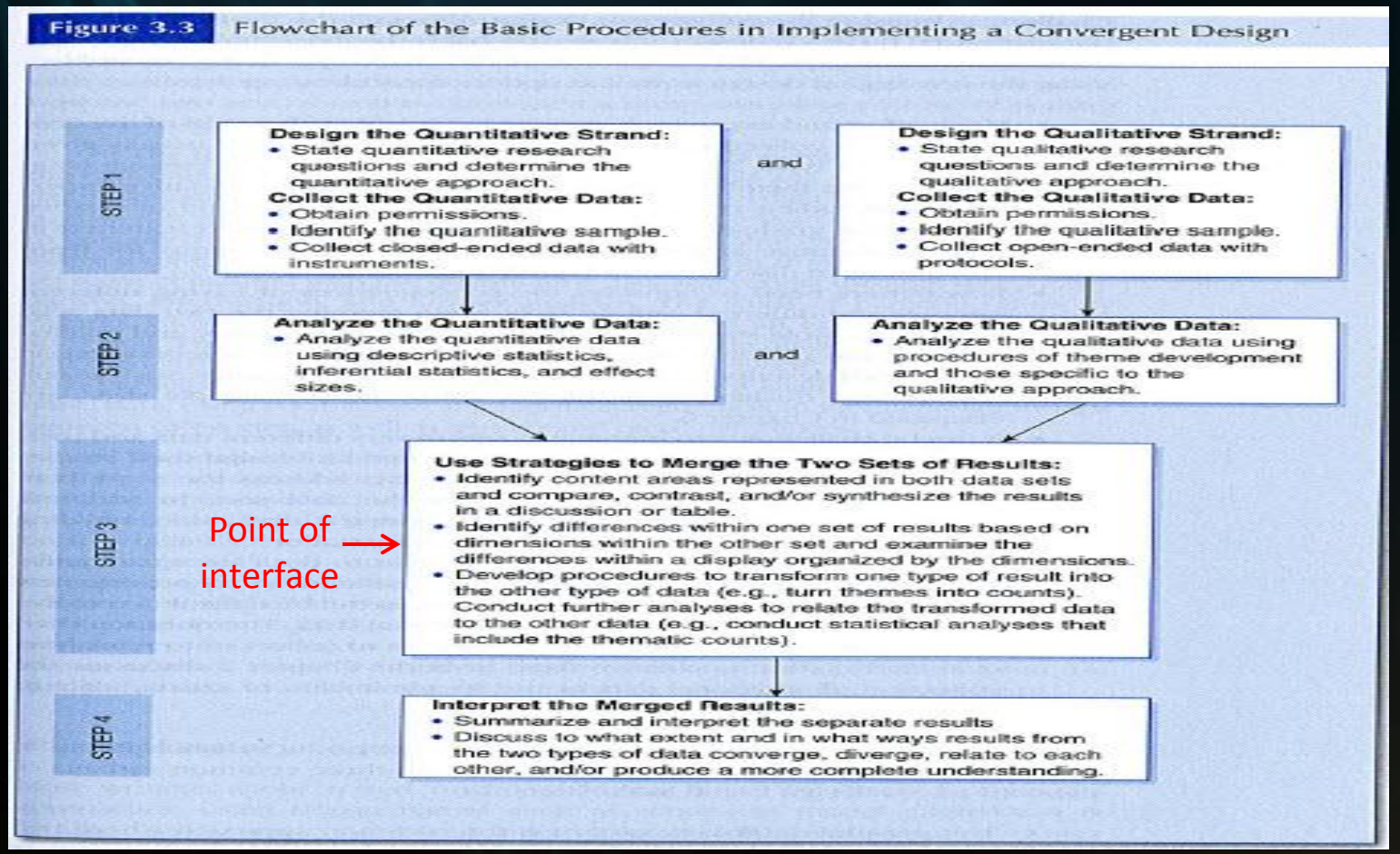
- Convergent parallel design
  - Collect and analyze two independent strands of quantitative and qualitative data at the same time/ in a single phase.
  - Prioritize the methods equally.
  - Keep the data analysis independent.
  - Mix the results during the overall interpretation.
  - Try to look for convergence, divergence, contradictions, or relationships of two sources of data.

Convergent Parallel Design

- Procedure (Flowchart)
  - Collect both types of data concurrently
  - Analyze two data sets separately
  - Merge the results
  - Interpret combined results

Mixed Methods Research

- Convergent parallel design: flowchart



Convergent Parallel Design

- Design
  - Research questions: create parallel questions for the qual and quan studies.
  - Samples: different or same group of people in quantitative and qualitative studies?
  - Sample sizes: equal or unequal

Convergent Parallel Design

- Design:
  - Data will be collected from one source or different sources: survey/interview or only use survey.
  - Order of two types of data collections: survey first then focus group or one-on-one interview.

Convergent Parallel Design

- Merged data analysis strategies
  - Side-by-side comparison (in a results or discussion section or a summary table).
    - Present quantitative or qualitative results
    - Followed by qualitative or quantitative results
    - Followed by comments describe how qual/quan confirm or disconfirm quan/qual results.

Convergent Parallel Design

- Merged data analysis strategies
  - Joint display: using table or figure to show both quan and qual results
  - Data transformation merged analysis: transform one type of data (qual) into the other type of data (quan).
    - Create a new variable based on presence of a theme
    - Create a new variable based on number of times a theme appears.

Convergent Parallel Design

- Interpreting merged results
  - Look for similarity and convergence
  - How to handle discrepancy?
    - State the limitations of the study
    - Revisit two types of data
    - Could collect additional data

Convergent Parallel Design

- Challenges
  - Needs both quantitative and qualitative expertise
  - Consequences of having different samples and different sample size when merging two data sets.
  - How to merge two types of data.
  - How to deal with the situation in which quantitative and qualitative results contradict each other.

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- Convergent parallel design variants
  - Parallel-databases variants: two sets of data merge at the final step.
  - Data-transformation variant
  - Data-validation variant: such as open-ended questions on a questionnaire.

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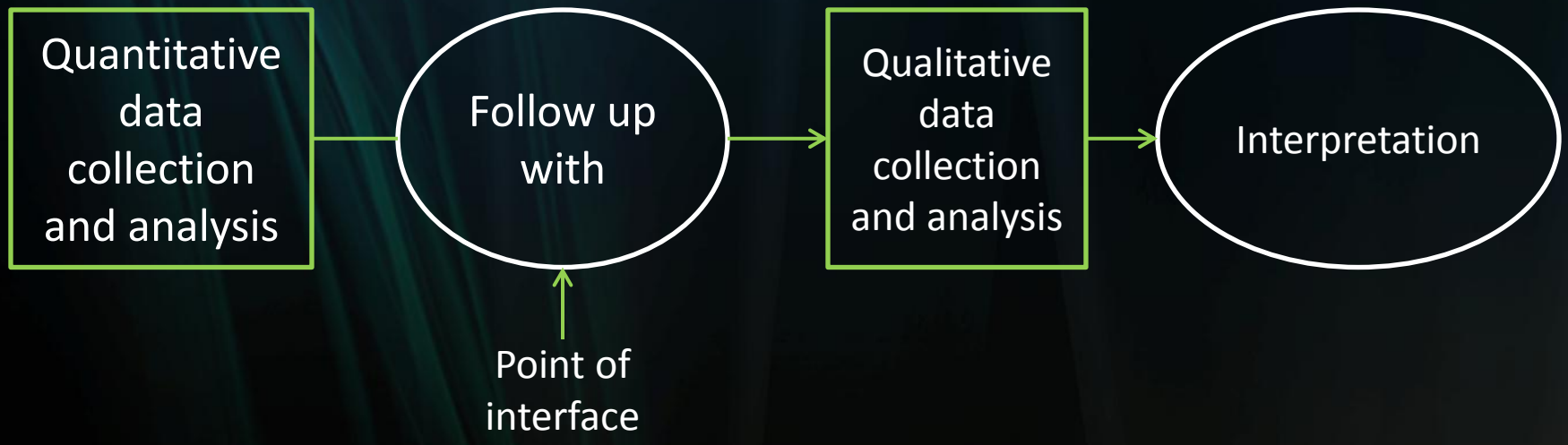
- Major designs
  - (2). Explanatory sequential design: purpose of this design is to use qualitative approach to explain quantitative results (significant, non-significant, outliers or surprising results) or to guide to form groups based on quantitative results

Mixed Methods Research

- Explanatory sequential design (diagram)



Explanatory Sequential Design

- Published paper
  - Nataliya V. Ivankova and Sheldon L. Stick (2007). Students' persistence in a distributed doctoral program in educational leadership in higher education: A mixed methods study. *Research in Higher Education, 48*(1):93-135 http://www.jstor.org/stable/25704494

Explanatory Sequential Design

- Published paper
  - Niobe Way, Helena Y. Stauber, Michael J. Nakkula and Perry London (1994). Depression and substance use in two divergent high school cultures: A quantitative and qualitative analysis. *Journal of Youth and Adolescence, 23(3): 331-357*

http://www.springerlink.com/content/l367l0l77r213712/fulltext.pdf

Explanatory Sequential Design

- Mixed methods question

  “In what ways do the qualitative data help explain the quantitative results?”

Explanatory Sequential Design

- Key points
  - Typically it is a two-phase design.
  - Collect quantitative and qualitative data at different time.
  - Qualitative study depends on quantitative results.
  - Usually quantitative data collection is the priority.

Explanatory Sequential Design

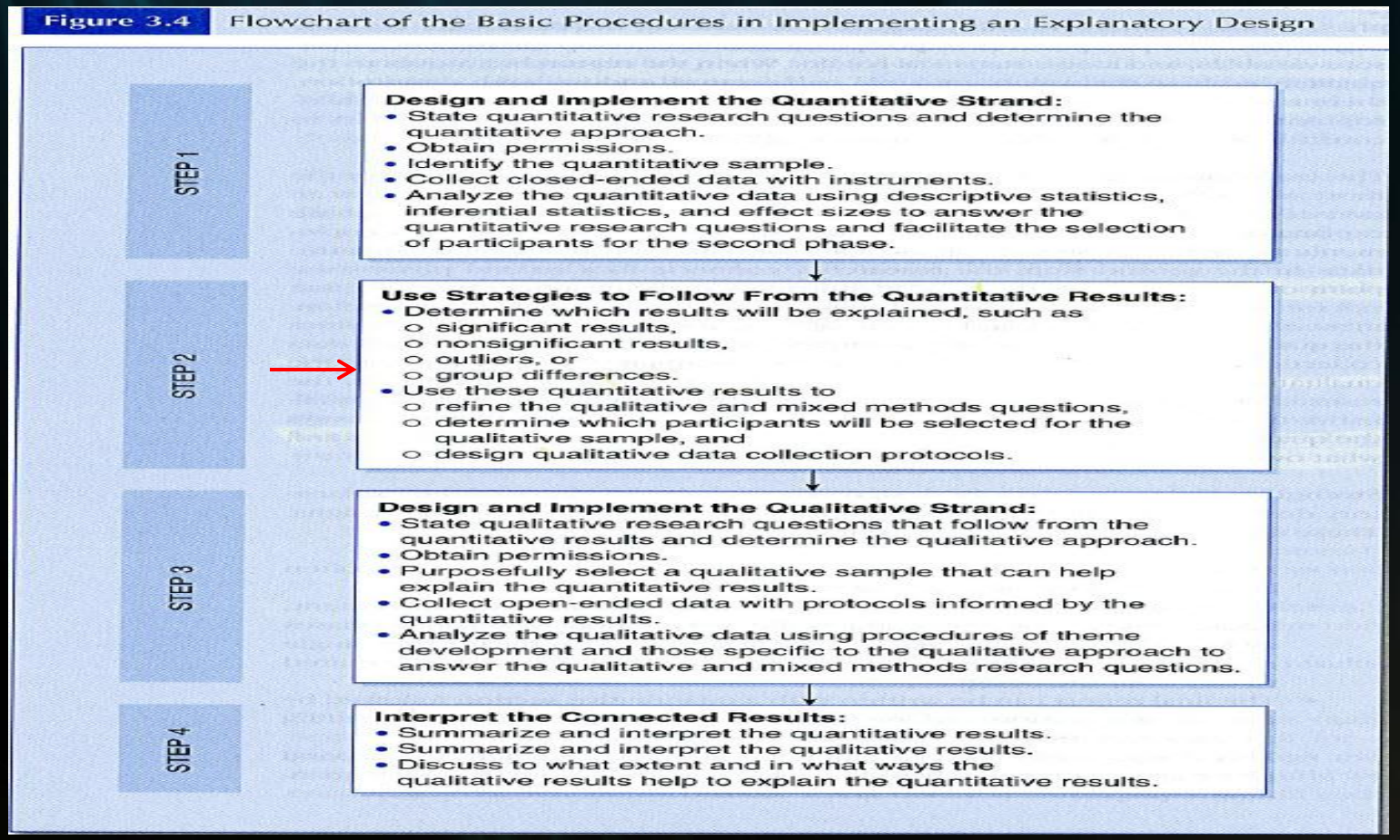
- Procedure
  - First, collect and analyze quantitative data.
  - Identify specific quantitative results that need additional explanation.
  - Design qualitative study based on what learn from quantitative results.

Explanatory Sequential Design

- Procedure
  - Collect and analyze qualitative data.
  - Interpret combined results.

Mixed Methods Research

- Explanatory sequential design: procedure



Explanatory Sequential Design

- Design
  - Samples: different or same group of people in both studies?
    - The participants in the qualitative study should be those who participated in the quantitative study.
  - Sample sizes: equal or unequal
    - Qualitative study uses smaller sample.

Explanatory Sequential Design

- Design
  - Decide what quantitative results to follow up.
    - Unclear
    - Unexpected
    - Significant/non-significant results
    - Outliers or extreme cases

Explanatory Sequential Design

- Design
  - How to select participants for qualitative study
    - Individuals who volunteer to participate in interviews (weaker connection between two phases).
    - Systematic approach: based on quantitative results and select participants best able to fit in qualitative study (IRB issue).

Explanatory Sequential Design

- Design
  - IRB issues: suggestions
    - Separate IRB for each phase.
    - One IRB, state the follow up phase as tentative.
    - From the start, inform participants the possibility of second data collection.

Explanatory Sequential Design

- Select qualitative sample
  - Participants who are representative of different groups.
  - Participants with extreme scores.
  - Participants differed in their scores on significant predictors.

Explanatory Sequential Design

- Interpreting connected results
  - Conclusion is about whether the follow up qualitative data provide a better understanding of the research problem than simply the quantitative results.

Explanatory Sequential Design

- Explanatory sequential design variants
  - Follow-up explanation variant
  - Participation-selection variant: it needs quantitative results to help select best participants. It places priority on the second, qualitative phase.

Explanatory Sequential Design

- Challenges
  - Time consuming
  - IRB issue
  - Decisions about which quantitative results need further explanation.
  - Decisions about who to sample and what criteria used for sample selection for qualitative study.

Mixed Methods Research

- Major designs
  - (3). Exploratory sequential design: also referred to as instrument development design. The purpose of this design is to generalize qualitative findings to a larger sample.

Exploratory Sequential Design

Reference for instrument design

DeVellis, R. F. (2003). Scale development: theory and application (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Downing, S. M. & Haladyna, T. M. (2006). Handbook of test development. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Fishman, J. A. & Galguera, T. (2003). Introduction to test construction in the social and behavioral sciences: a practical guide. Lanham, MD: Rowman & Littlefield Publishers, Inc.

Pett, M. A., Lackey, N. R.,& Sullivan, J. J. (2003). *Making sense of factor analysis: the use of factor analysis for instrument development in health care research*. Thousand Oaks, CA: Sage Publications, Inc.

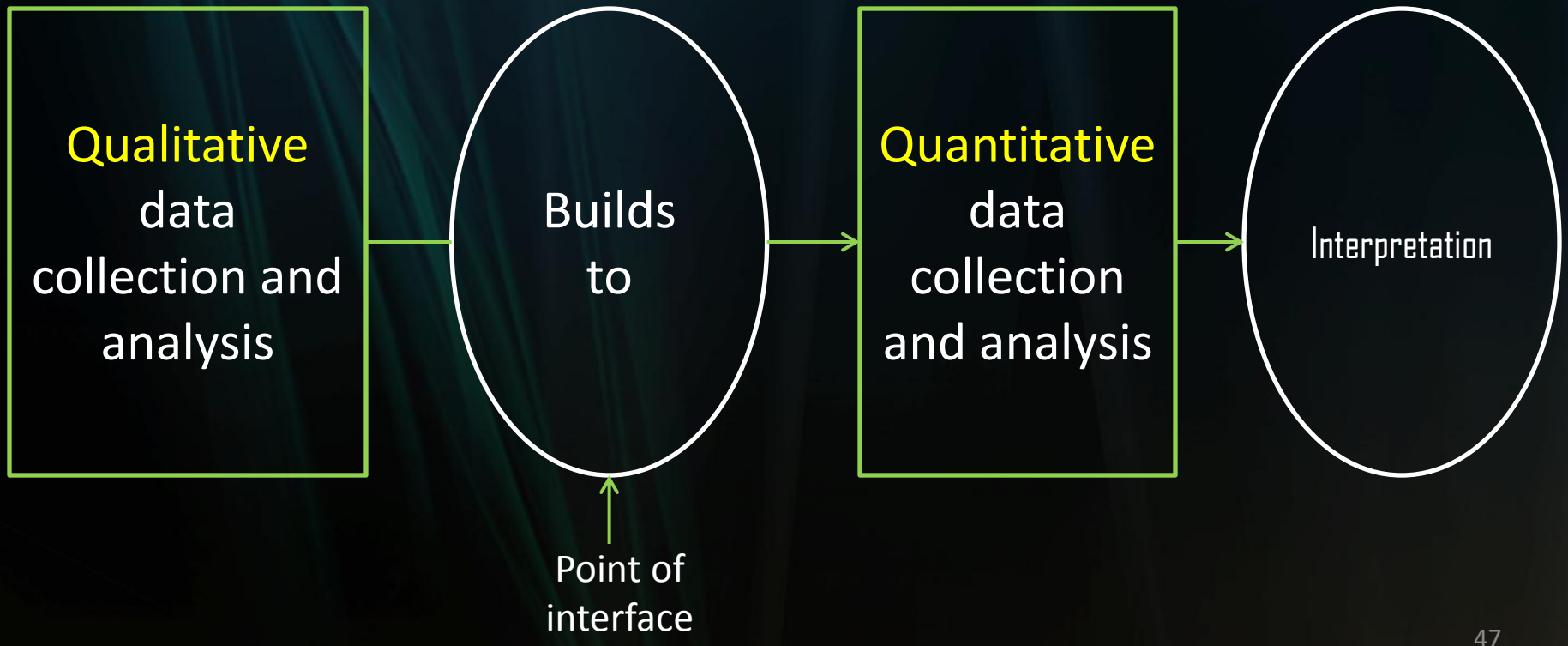
Exploratory Sequential Design

- Published paper
  - Myers, Karen Kroman; Oetzel, John G. *(2003). Communication Quarterly*, *51*(4), 438-457.

http://ehis.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=3&hid=2&sid=2339ee9b-08f8-45b1-babf-b7e2c0d193ef%40sessionmgr12

Exploratory Sequential Design

- Design diagram



Exploratory Sequential Design

- Purpose of this design:
  - The qualitative phase is used to help develop or inform the quantitative study.
    - Instrument design (explore)
    - Grounded theory (generalize qualitative results)

Exploratory Sequential Design

- Reasons for using this design
  - Instruments are not available
  - The variables are not known
  - There is no theory or model as a guide

Exploratory Sequential Design

- Key points
  - Typically it is a two-phase design.
    - Three phases for instrument development (instrument development phase, a phase testing, and apply the instrument).
  - Collect quantitative and qualitative data at different time.
  - Qualitative results can help and inform the second quantitative method.

Exploratory Sequential Design

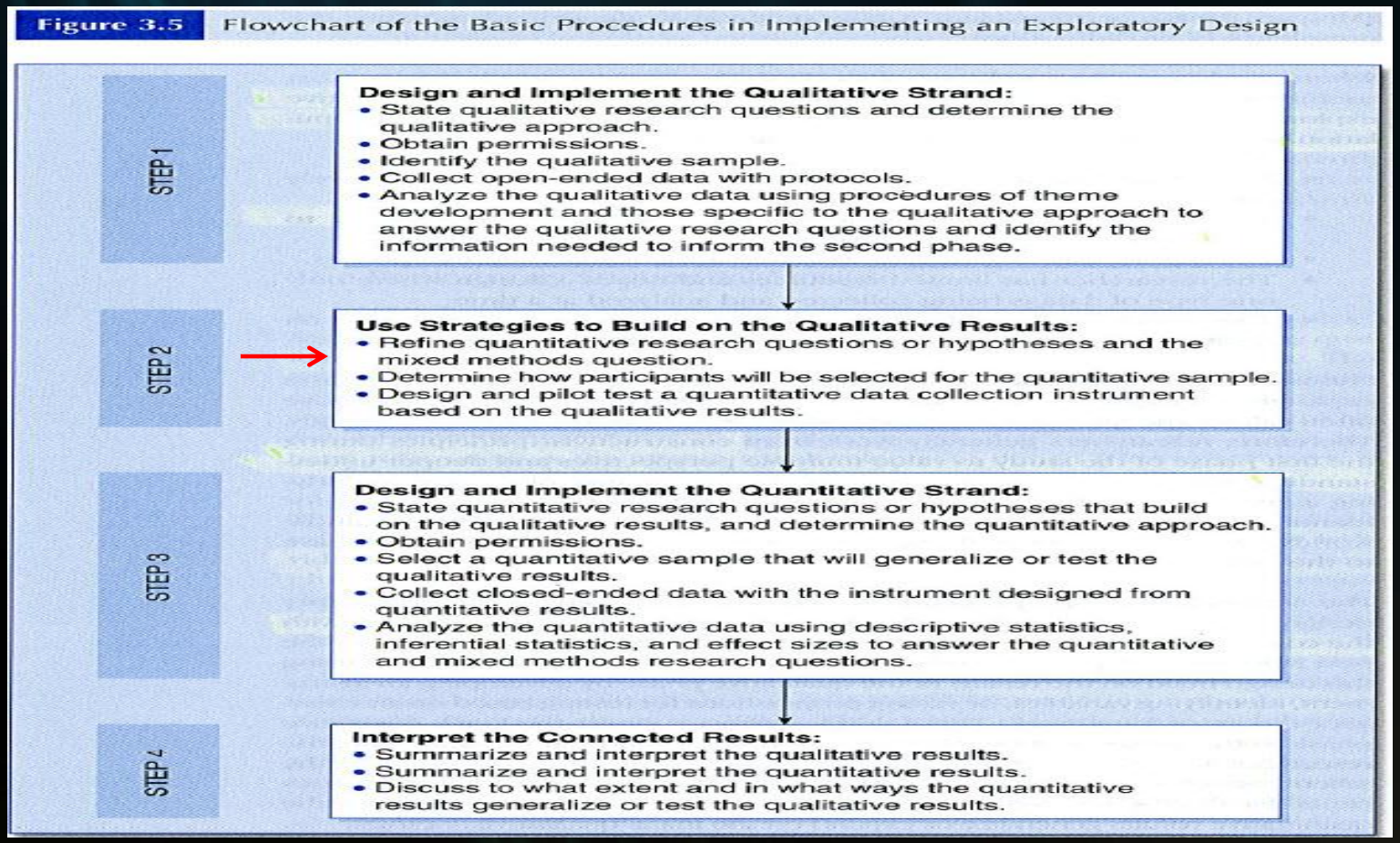
- Mixed design research question
  - In what ways do the quantitative results generalize the qualitative findings?

Exploratory Sequential Design

- Procedure
  - First, collect and analyze qualitative data.
  - Develop quantitative study based on what you learn from qualitative results.
  - Collect and analyze quantitative data.

Mixed Methods Research

- Exploratory sequential design: flowchart



Exploratory Sequential Design

- Design
  - Samples: different or same group of people in both studies?
    - The participants in the quantitative study are NOT same individuals who provided qualitative data.
  - Sample sizes: equal or unequal
    - Quantitative study uses larger sample.

Exploratory Sequential Design

- Design
  - IRB issues for emerging follow-up phase:
    - Separate IRB for each phase.
    - One IRB, state the follow up phase as tentative.

Exploratory Sequential Design

- Design
  - Decide what qualitative results to use.
    - Useful quotes
    - Codes > variables
    - Themes > constructs

Exploratory Sequential Design

- Design
  - How to develop a good instrument: scale development.
    - Steps for instrument development

Exploratory Sequential Design

Step 1	• Determine what you want to measure
Step 2	• Generating an item pool
Step 3	• Determine the format for items
Step 4	• Expert review of initial item pool
Step 5	• Add social desirability items
Step 6	• Pilot testing and item analysis
Step 7	• Administer instrument to a larger sample
Step 8	• Evaluate the items
Step 9	• Revise instrument

DeVellis (2003); Fishman & Galguera (2003); Pett, Lackey, & Sullivan (2003)

Exploratory Sequential Design

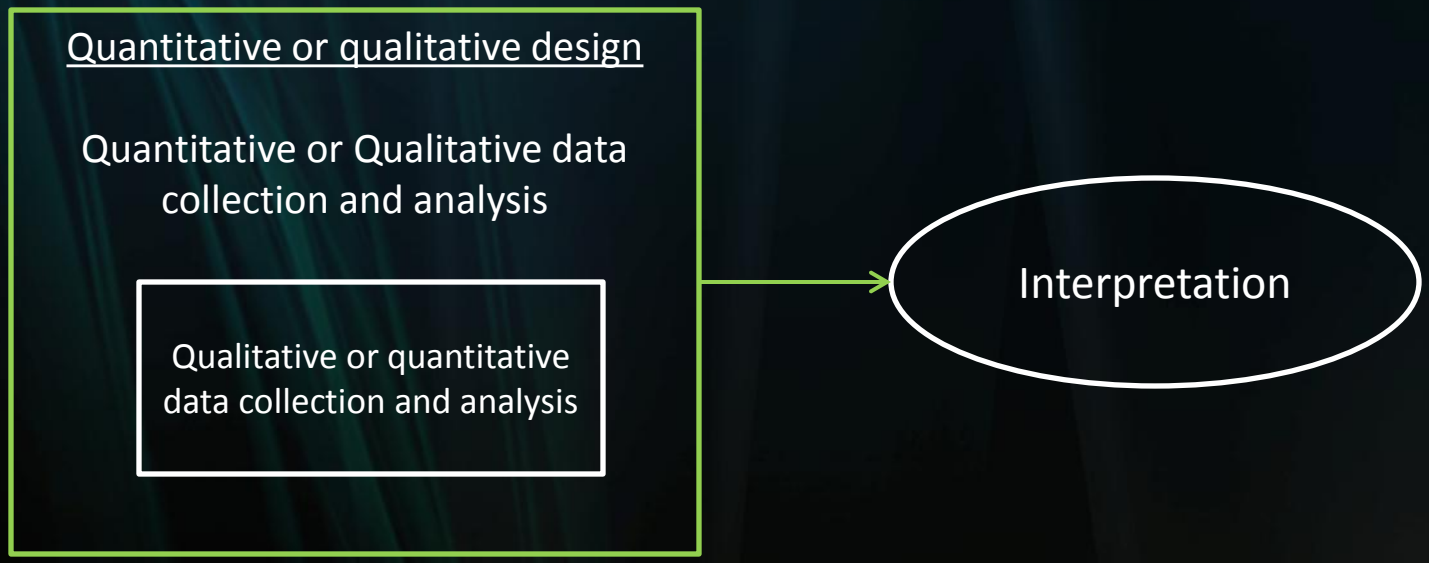
- Exploratory sequential design variants
  - Theory-development variant: test emergent theory
  - Instrument development variant: initial qualitative phase plays a secondary role.

Mixed Methods Research

- Major designs
  - (4). Embedded design: purpose of this design is to answer different questions that requires different types of data.

Mixed Methods Research

- Embedded designs



Mixed Methods Research

- Embedded design
  - A quantitative or qualitative data collection is within a quantitative or qualitative procedure.
  - A single data set is not enough.
  - Two types of data answer different research questions.
  - The collection and analysis of the second data set may occur before, during, and/or after the first data collection.

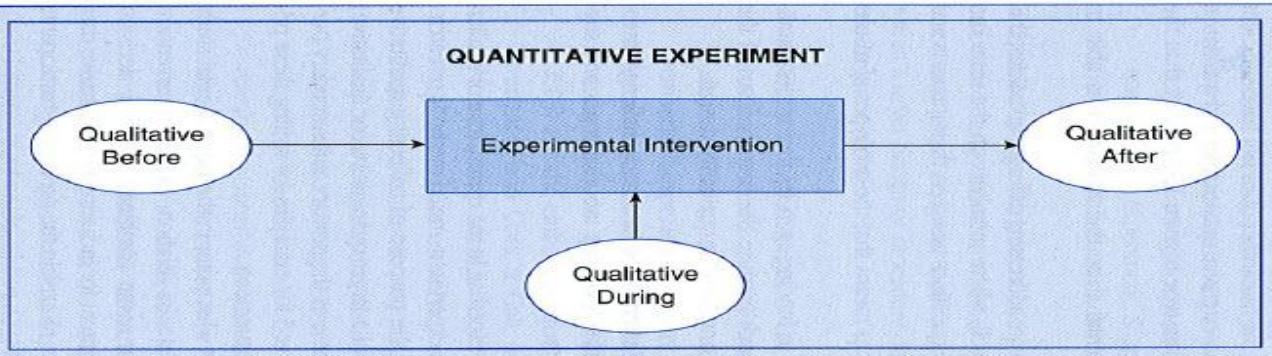
Mixed Methods Research

- Examples of embedded design: Qualitative data in quantitative study:
  - Develop an instrument in an intervention trial.
  - Try to understand the impact of the intervention on participants.
  - Test long term effects of an intervention after a trial.

Mixed Methods Research

- Embedded design: procedure

Figure 3.6 Flowchart of the Basic Procedures in Implementing an Embedded Design



Implement the Qualitative Strand Before the Experiment:
- Decide the reason for the qualitative strand.
- State qualitative research questions, and determine the qualitative approach.
- Obtain permissions.
- Identify the qualitative sample.
- Collect open-ended data.
- Analyze the qualitative data using procedures of theme development and those specific to the qualitative approach.

Use the Qualitative Strand to Plan the Experiment, Such as:
- Refine recruitment procedures.
- Develop outcome measure.
- Develop intervention.

Implement the Qualitative Strand During the Experiment:
- Decide the reason for the qualitative strand.
- State qualitative research questions, and determine the qualitative approach.
- Obtain permissions.
- Identify the qualitative sample.
- Collect open-ended data.
- Analyze the qualitative data using procedures of theme development and those specific to the qualitative approach.

Use the Qualitative Strand to Understand the Experiment, Such as:
- Describe participants' experiences with the intervention.
- Describe the process.
- Describe treatment fidelity.

Implement the Qualitative Strand After the Experiment:
- Decide the reason for the qualitative strand.
- State qualitative research questions, and determine the qualitative approach.
- Obtain permissions.
- Identify the qualitative sample.
- Collect open-ended data.
- Analyze the qualitative data using procedures of theme development and those specific to the qualitative approach.

Use the Qualitative Strand to Explain the Experiment, Such as:
- Describe why outcomes occurred.
- Describe how participants respond to the results.
- Describe what long-term effects are experienced.

Mixed Methods Research

- Embedded design variants
  - Embedded-experiment variant: qualitative data within an experiment trial.
  - Embedded instrument development and validation variant.
  - Mixed methods case studies
  - Mixed methods narrative research
  - Mixed methods ethnography

Embed both quantitative and qualitative data within traditional qualitative designs.

Mixed Methods Research

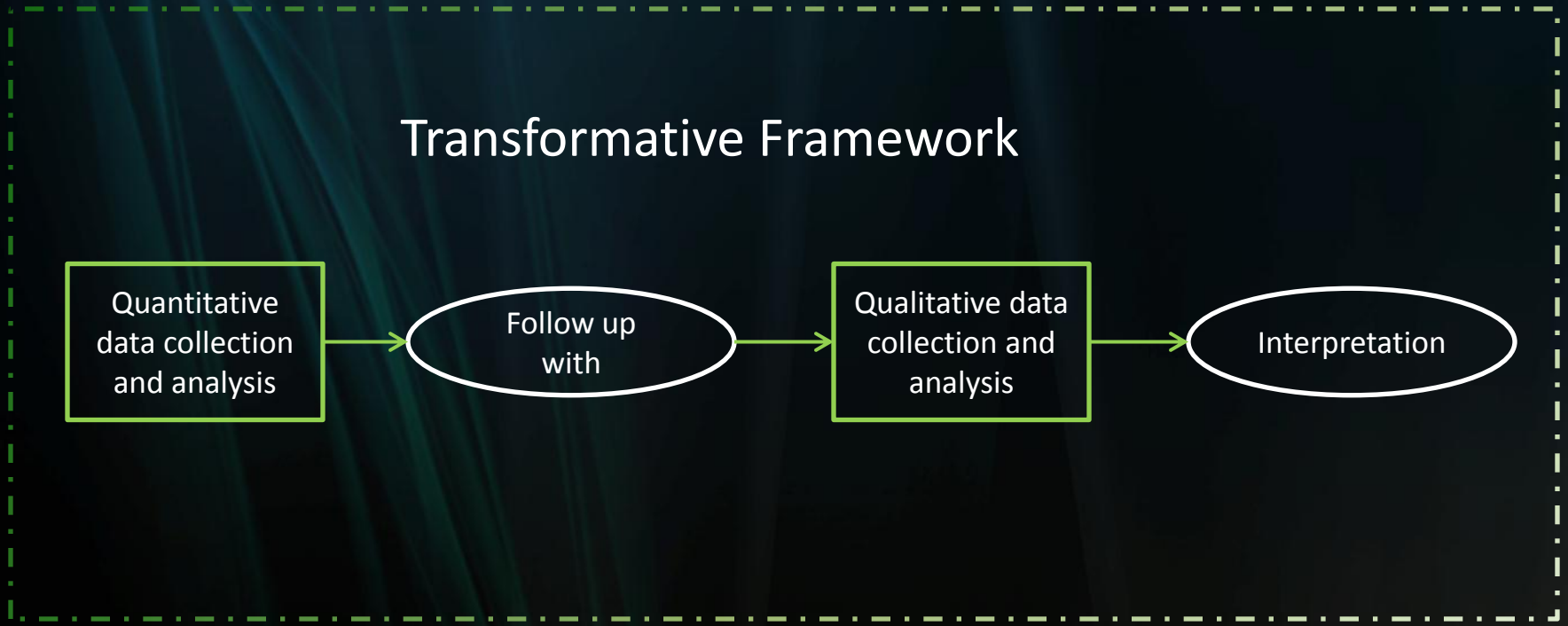
- Published paper
  - Victor, C. R., Ross, F., & Axford, J. (2004). Capturing lay perspectives in a randomized control trial of a health promotion intervention for people with osteoarthritis of the knee. *Journal of Evaluation in Clinical Practice, 10*(1), 63-70.

Mixed Methods Research

- Major designs
  - (5). Transformative design: the purpose of this design is to address issues of social justice and call for change for underrepresented or marginalized populations.
    - This design more relates to the content than to the methodology.
    - Is beyond first four basic mixed methods designs mentioned before.

Mixed Methods Research

- Transformative designs



Mixed Methods Research

- Transformative Framework
  - Is a framework for advancing the needs of underrepresented or marginalized populations.
  - Such as: Feminist theory, racial or ethnic theory, sexual orientation theory, and disability theory.

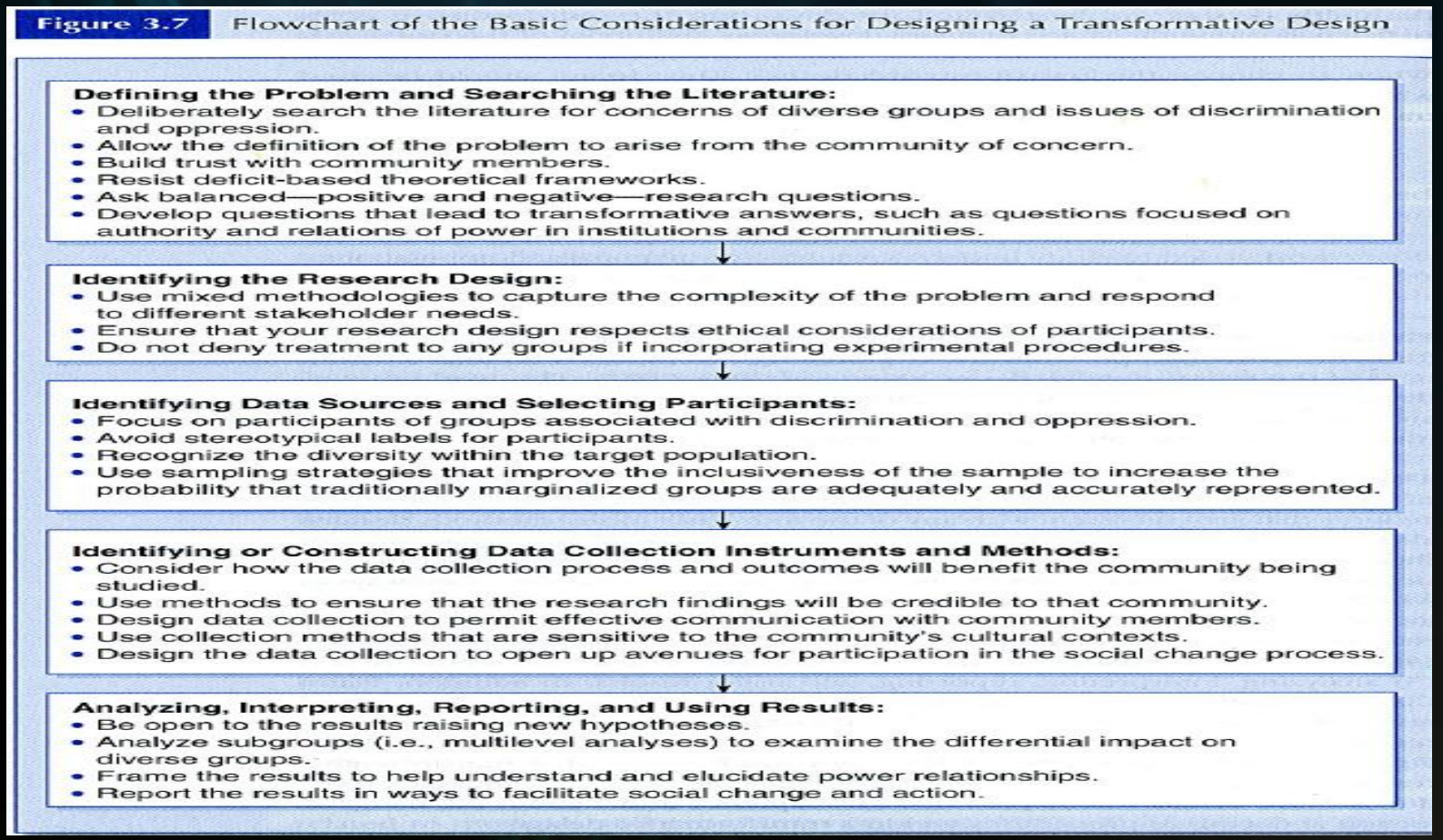
Mixed Methods Research

- Transformative design
  - All decisions about interaction, priority, timing, and mixing are made within the context of the transformative framework.
  - Researchers can implement any of four basic mixed methods designs within the transformative framework.

Mixed Methods Research

- Transformative design

Figure 3.7 Flowchart of the Basic Considerations for Designing a Transformative Design



Mixed Methods Research

- Challenges
  - Little guidance in the literature to assist researchers with implementing mixed methods in a transformative way.
  - Researchers need to have expertise in theoretical foundations of the study.

Mixed Methods Research

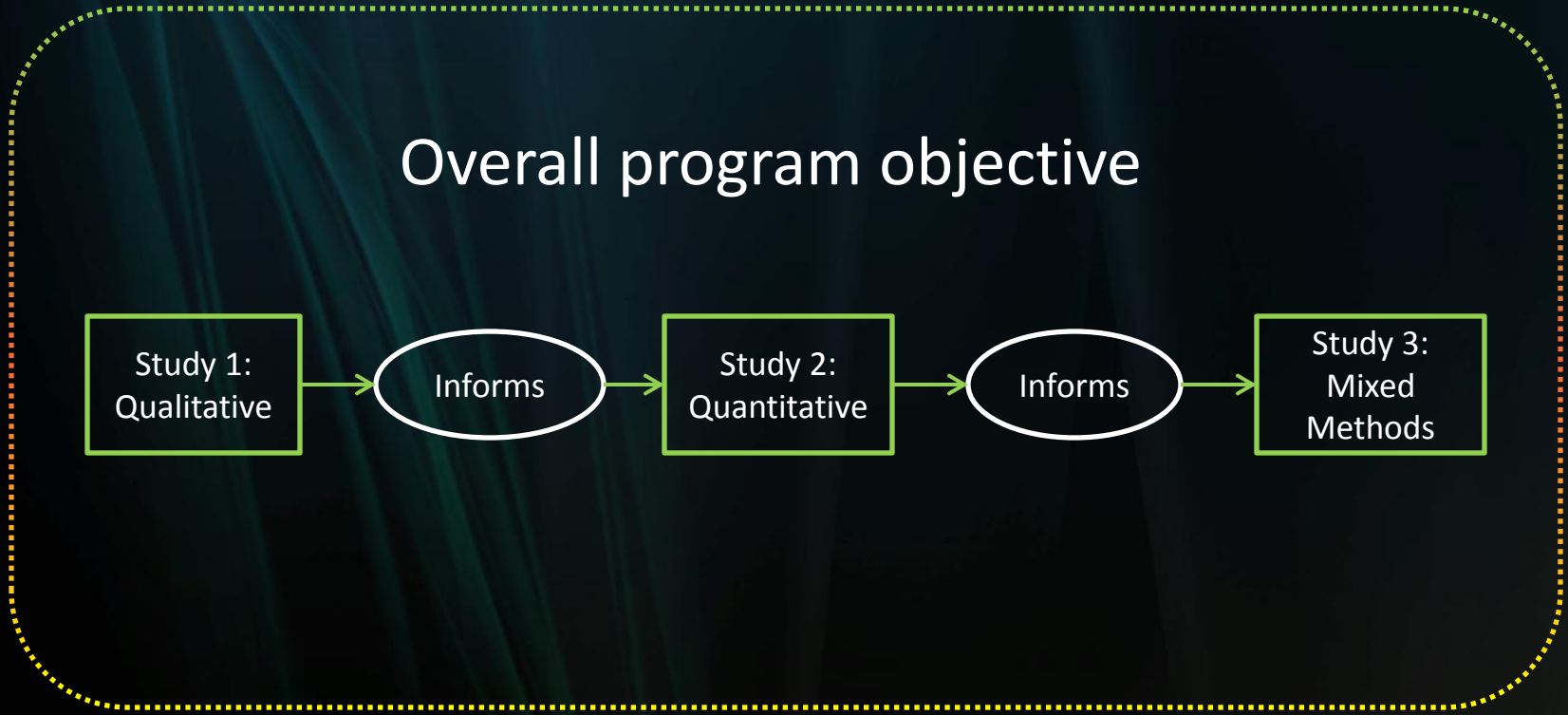
- Transformative design variants
  - Feminist lens transformative variant
  - Disability lens transformative variant
  - Socioeconomic class lens

Mixed Methods Research

- Major designs
  - (6). Multiphase: is an another example of a mixed methods design that goes beyond four basic designs.
    - It is a combination of sequential and concurrent aspects.
    - Most common in large funded or multiyear projects.

Mixed Methods Research

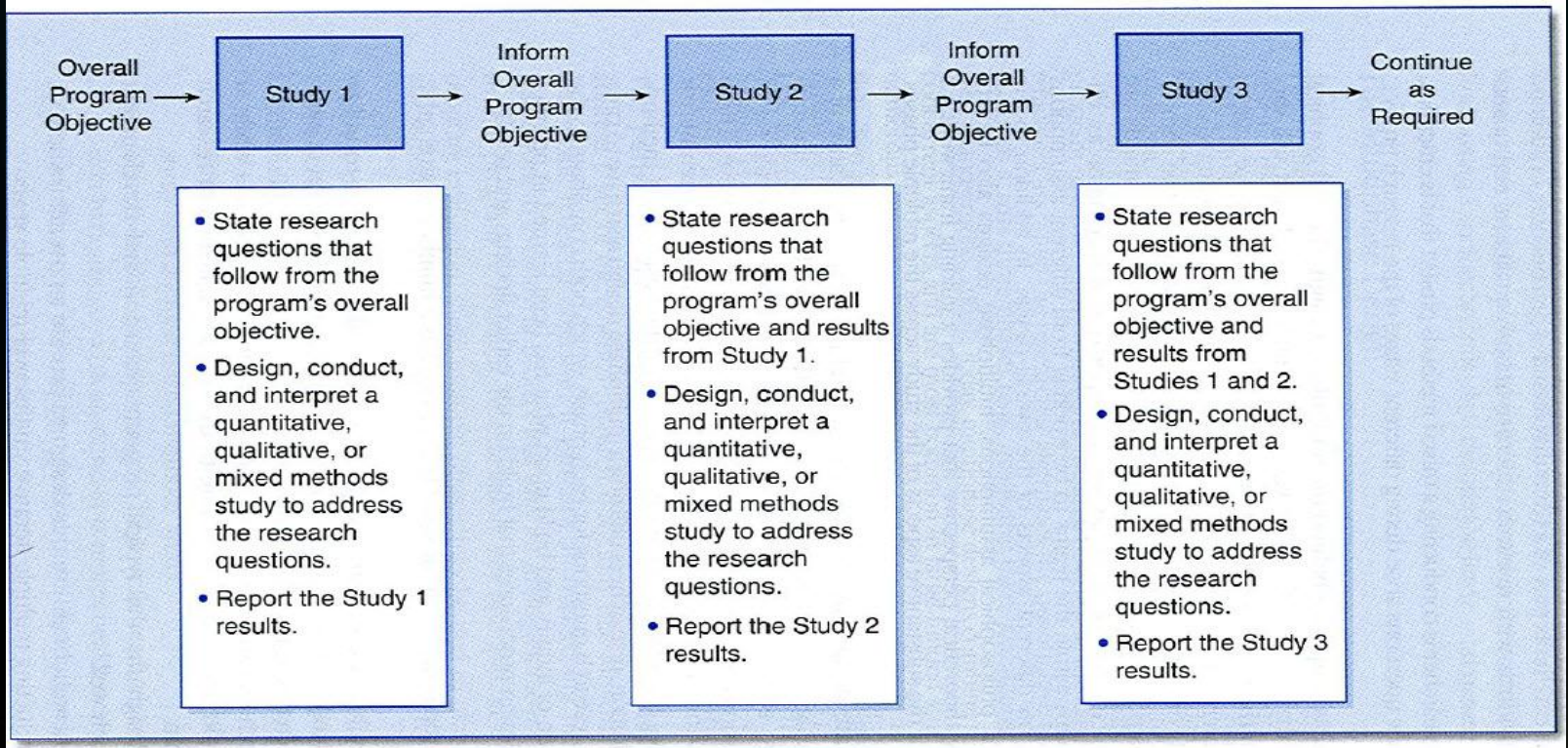
- Multiphase design



Mixed Methods Research

- Multiphase design

Figure 3.8 Flowchart of the Basic Procedures in Implementing a Multiphase Design



SOURCE: Figure based on Creswell and Plano Clark (2007) and Morse and Niehaus (2009)

Mixed Methods Research

- Challenges
  - Challenges associated with individual concurrent and sequential designs.
  - Needs sufficient resources, time, and effort.
  - May need a research team to implement research.

Mixed Methods Research

- Multiphase design variants
  - Large scale program development and evaluation
  - Multilevel statewide study
  - Single mixed methods studies that combine both concurrent and sequential phases

Mixed Methods Research

- Resources
  - International Congress for Qualitative Inquiry Conference
  - Mixed methods international conference
  - Journal of Mixed Methods Research
  - OBSSR (Office of Behavioral and Social Sciences Research) from NIH : Scientific areas > Methodology > Mixed Methods Research

Thank You