

Mixed Methods Research

Hui Bian

Office for Faculty Excellence

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

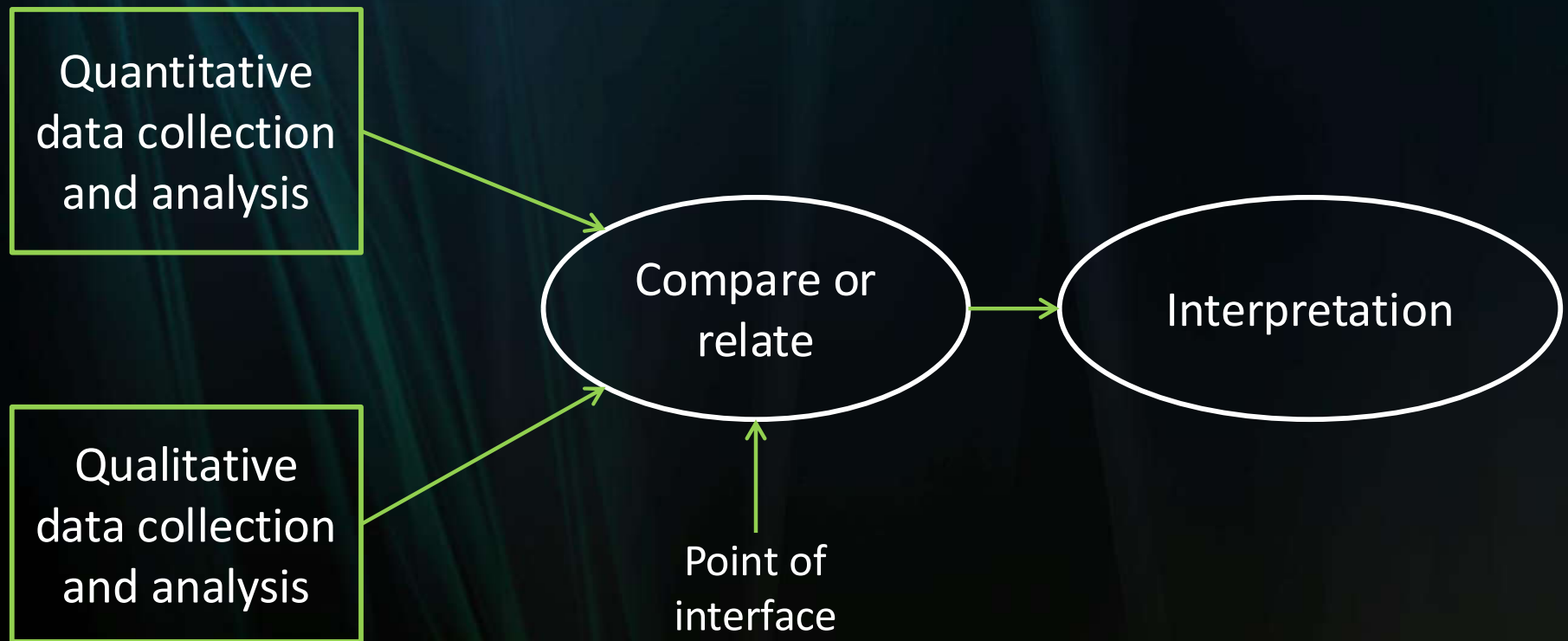
- Examples
 - Use interviews to explore how individuals describe a topic and use the findings to develop quantitative data collection instrument.

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

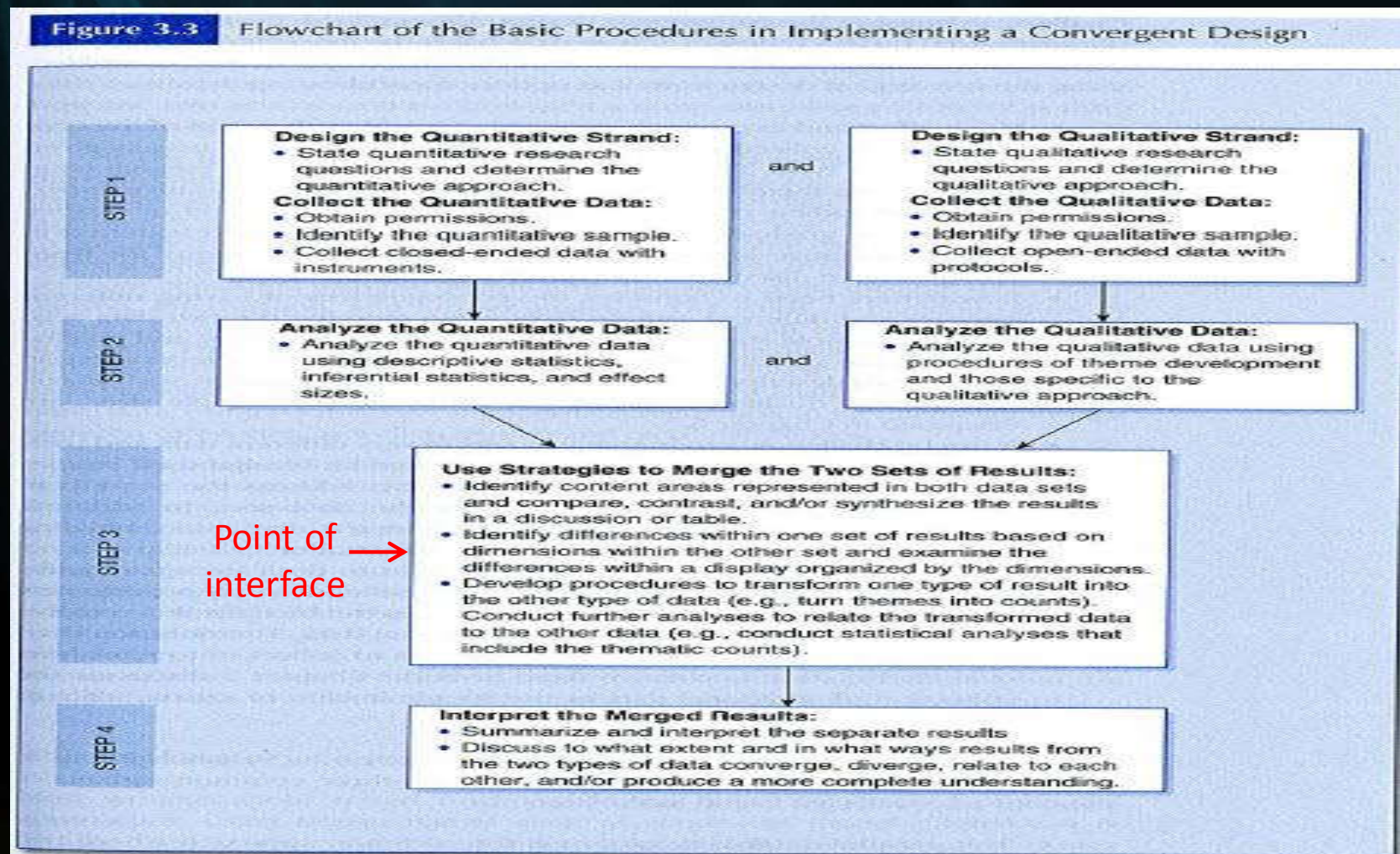
- Convergent parallel design
 - Collect and analyze two **independent** strands of quantitative and qualitative data **at the same time/ in a single phase**.
 - Prioritize the methods **equally**.
 - Keep the data analysis independent.
 - Mix the results during the **overall interpretation**.
 - Try 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/quant confirm or disconfirm quant/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.

Mixed Methods Research

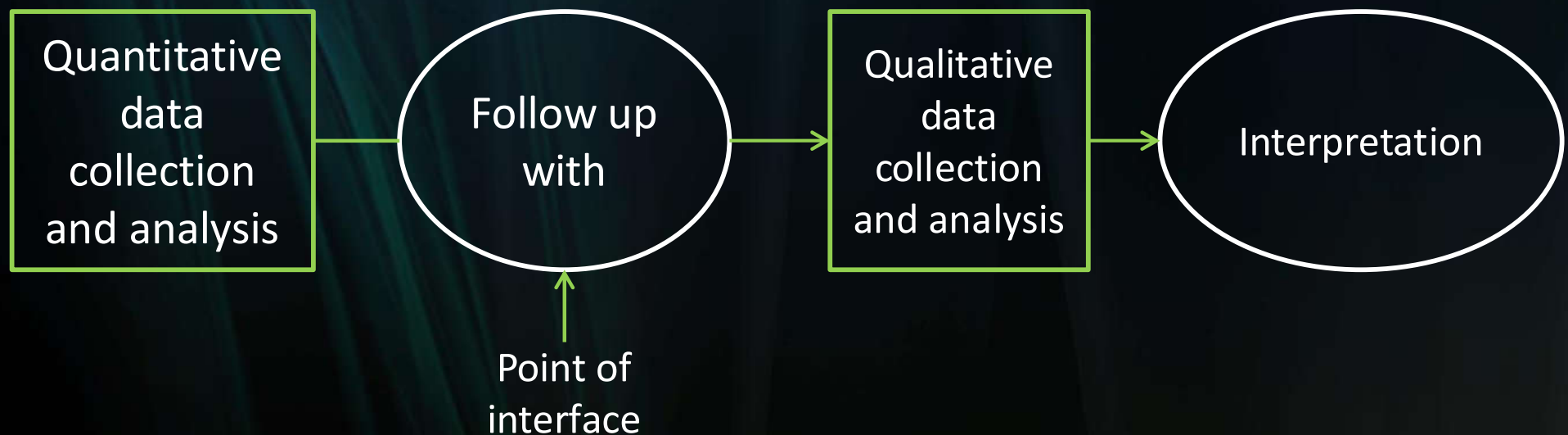
- Convergent parallel design variants
 - Parallel-databases variants: two sets of data merge at the final step.
 - Data-transformation variant
 - Data-validation variant: such as open-ended questions on a questionnaire.

Mixed Methods Research

- 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.

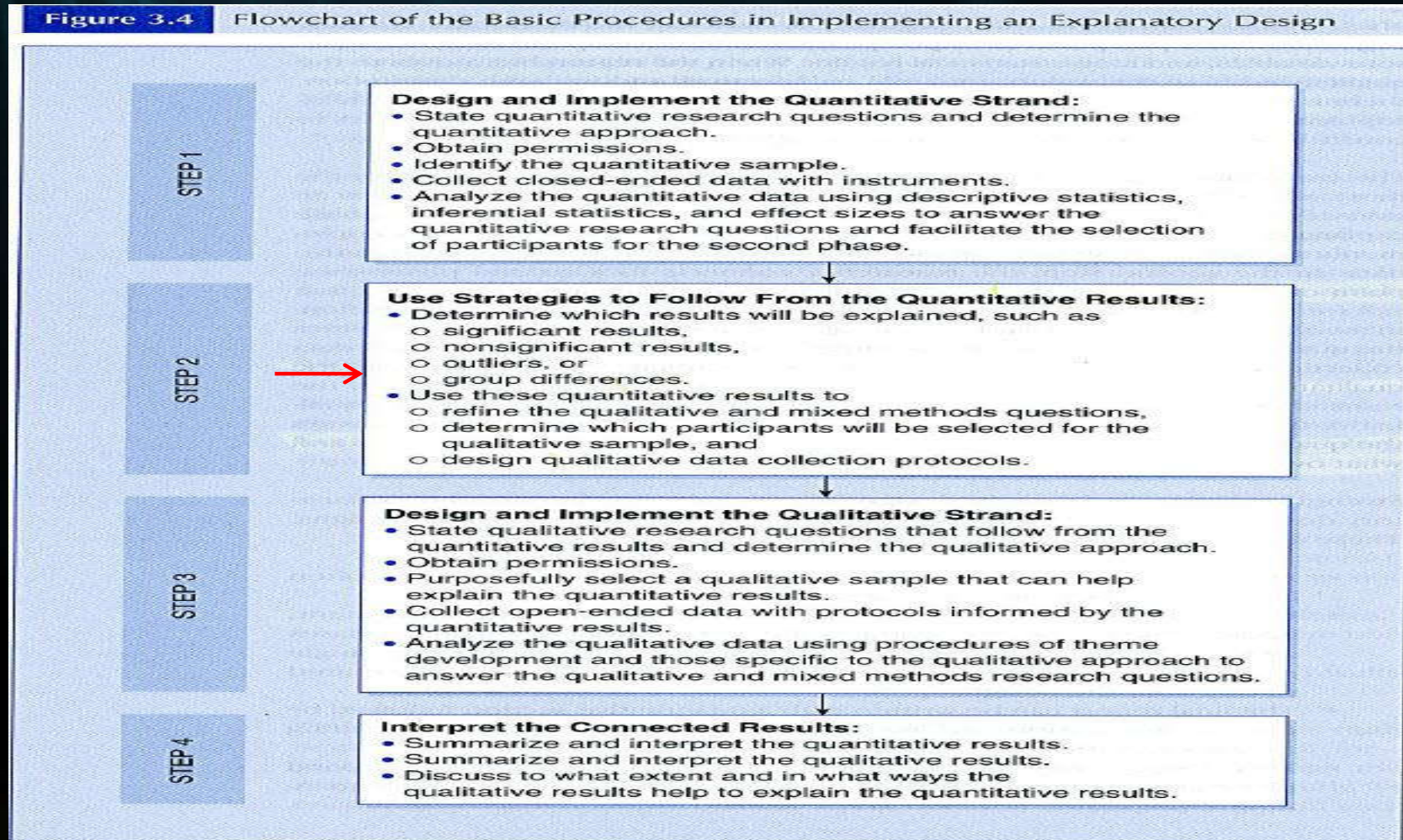
Explanatory Sequential Design

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

Mixed Methods Research

- Explanatory sequential design: procedure

Figure 3.4 Flowchart of the Basic Procedures in Implementing an Explanatory Design



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

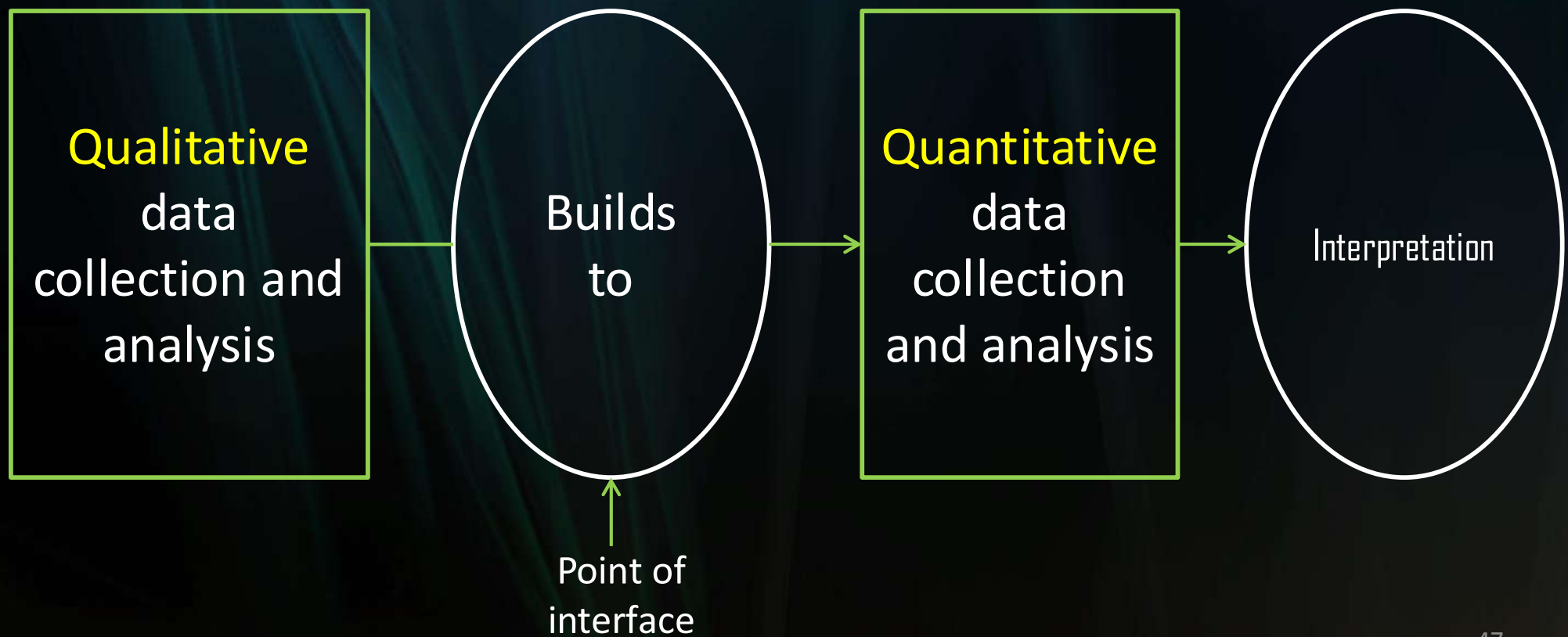
- Published paper

- 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?

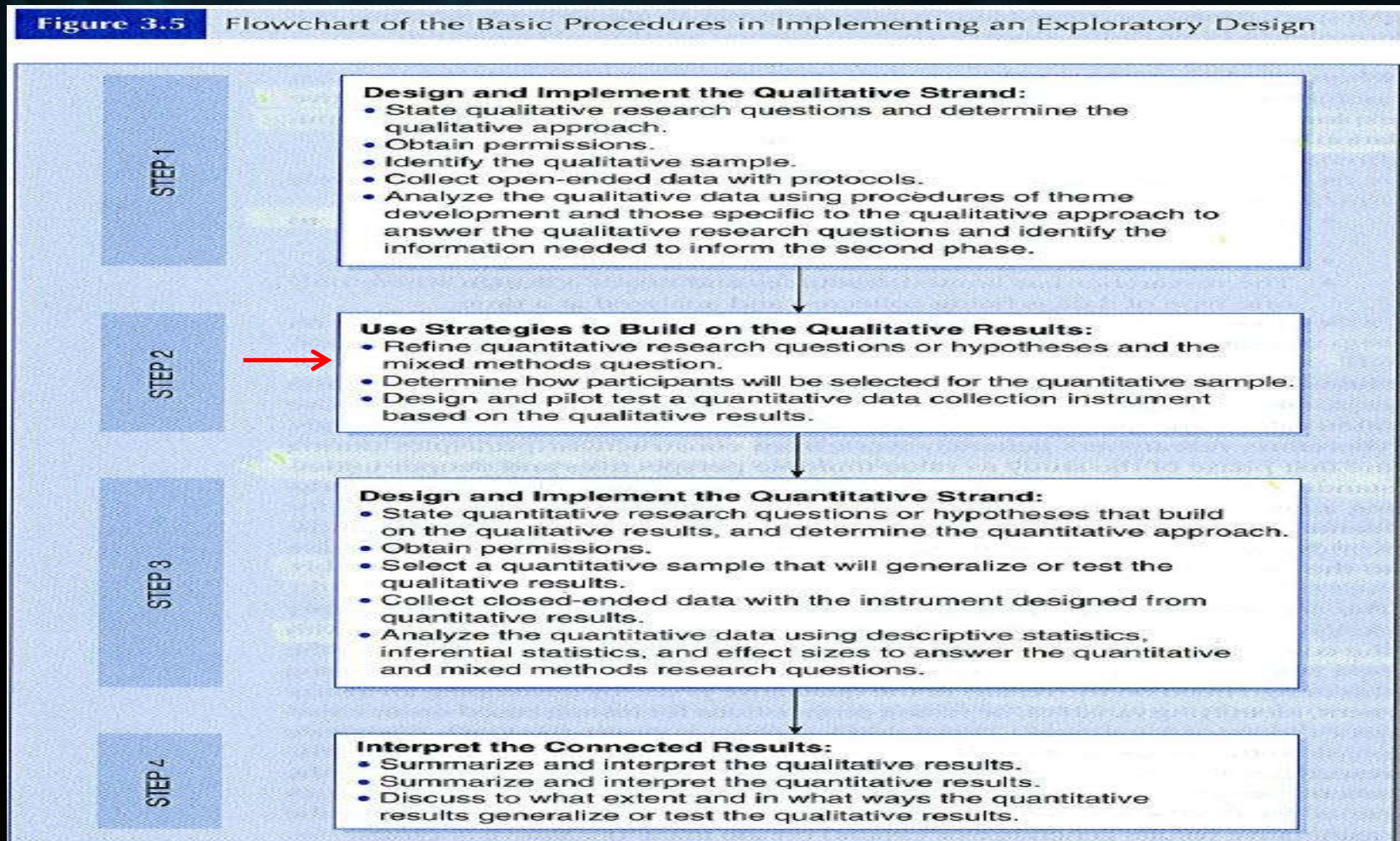
Exploratory Sequential Design

- 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

Figure 3.5 Flowchart of the Basic Procedures in Implementing an Exploratory Design



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**.

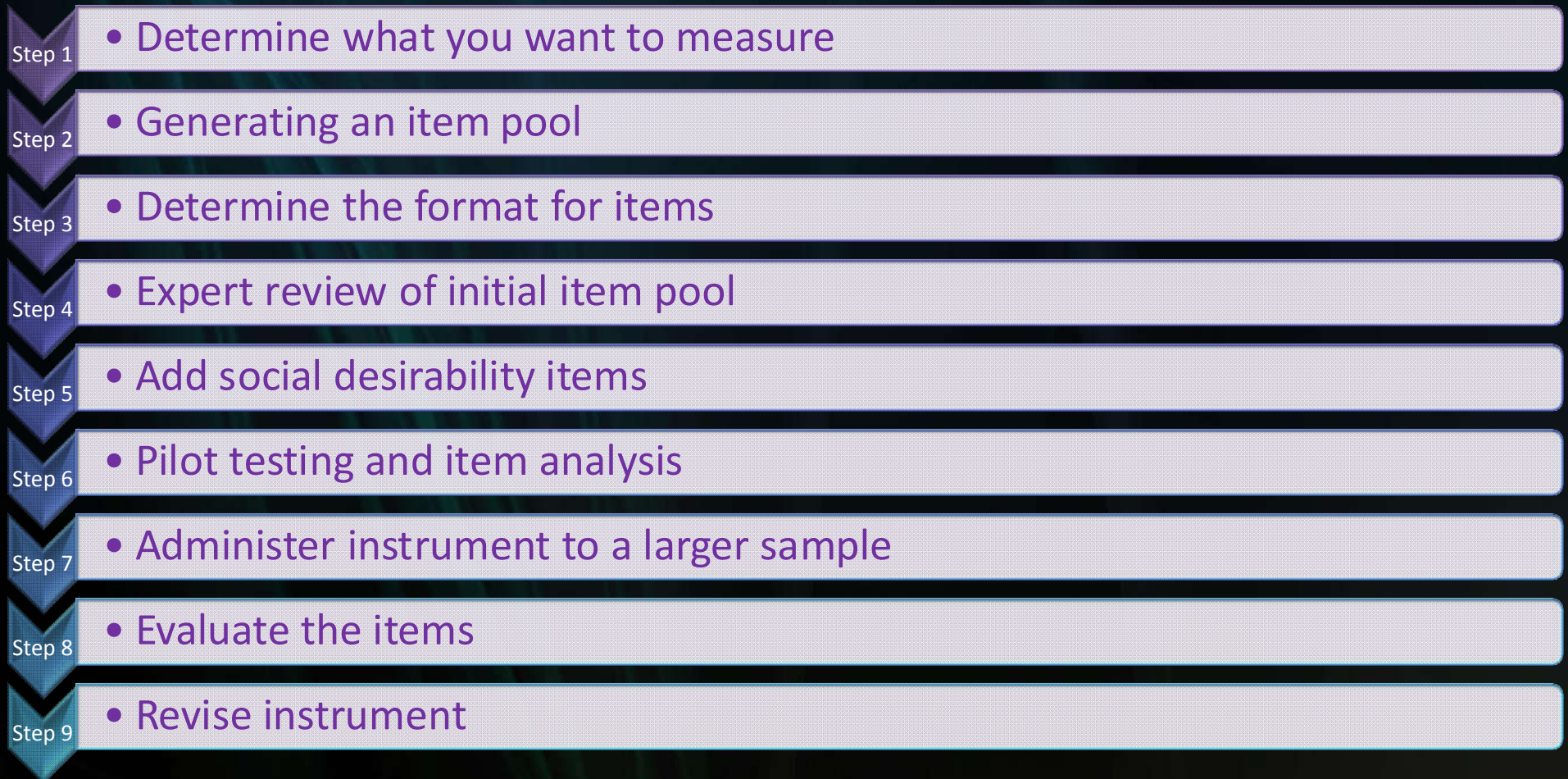
Exploratory Sequential Design

- 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



Exploratory Sequential Design

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