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

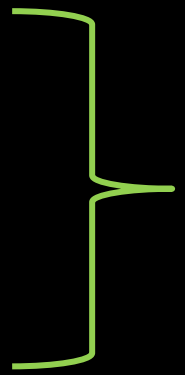
- How to choose an appropriate mixed methods design?
  - Level of interaction between two strands: independent or interactive.
  - Relative priority: equal/unequal priority
  - Timing: concurrent, sequential, or combination of those two
  - Where or how to mix the strands: point of interface and mixing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

- Six major designs
  - Convergent parallel design
  - Explanatory sequential design
  - Exploratory sequential design
  - Embedded design
  - Transformative design
  - Multiphase design



Basic designs

MIXED METHODS RESEARCH

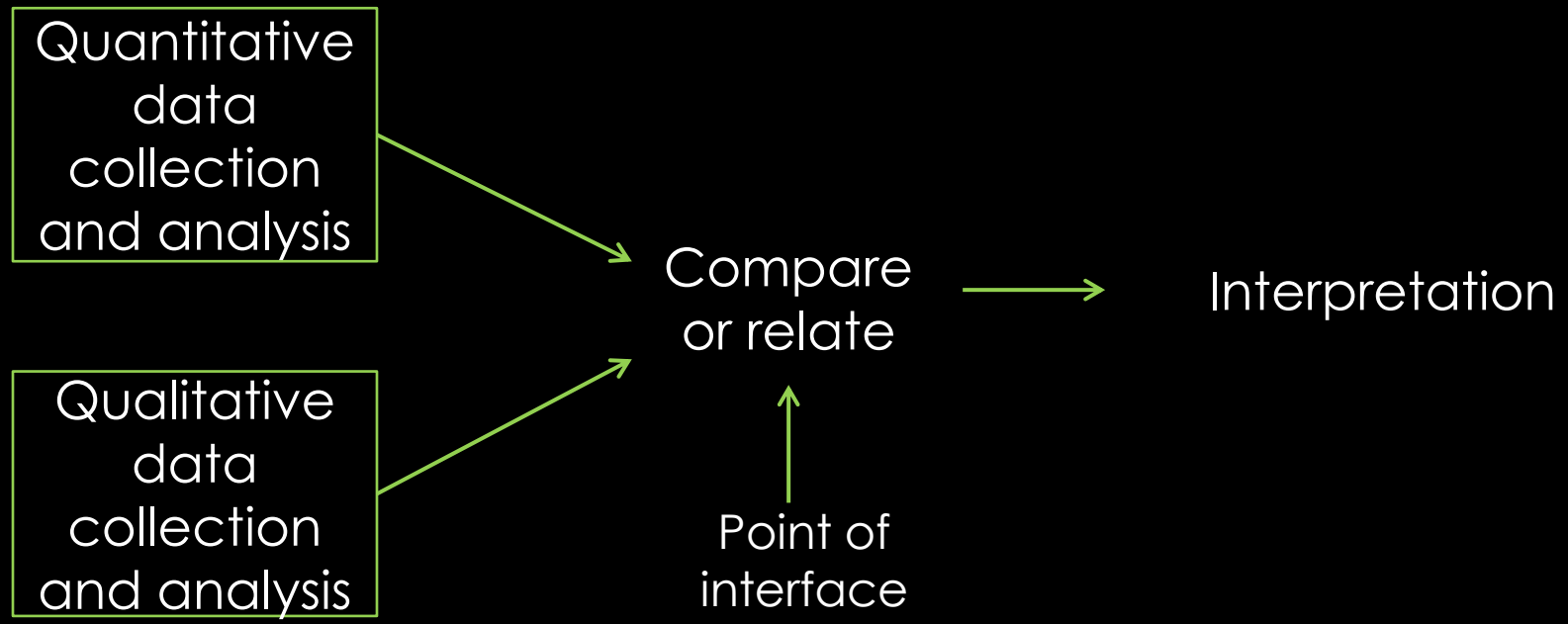
- Qualitative approaches
  - Narrative research
  - Phenomenological research
  - Grounded theory research
  - Ethnographic research
  - Case study research

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

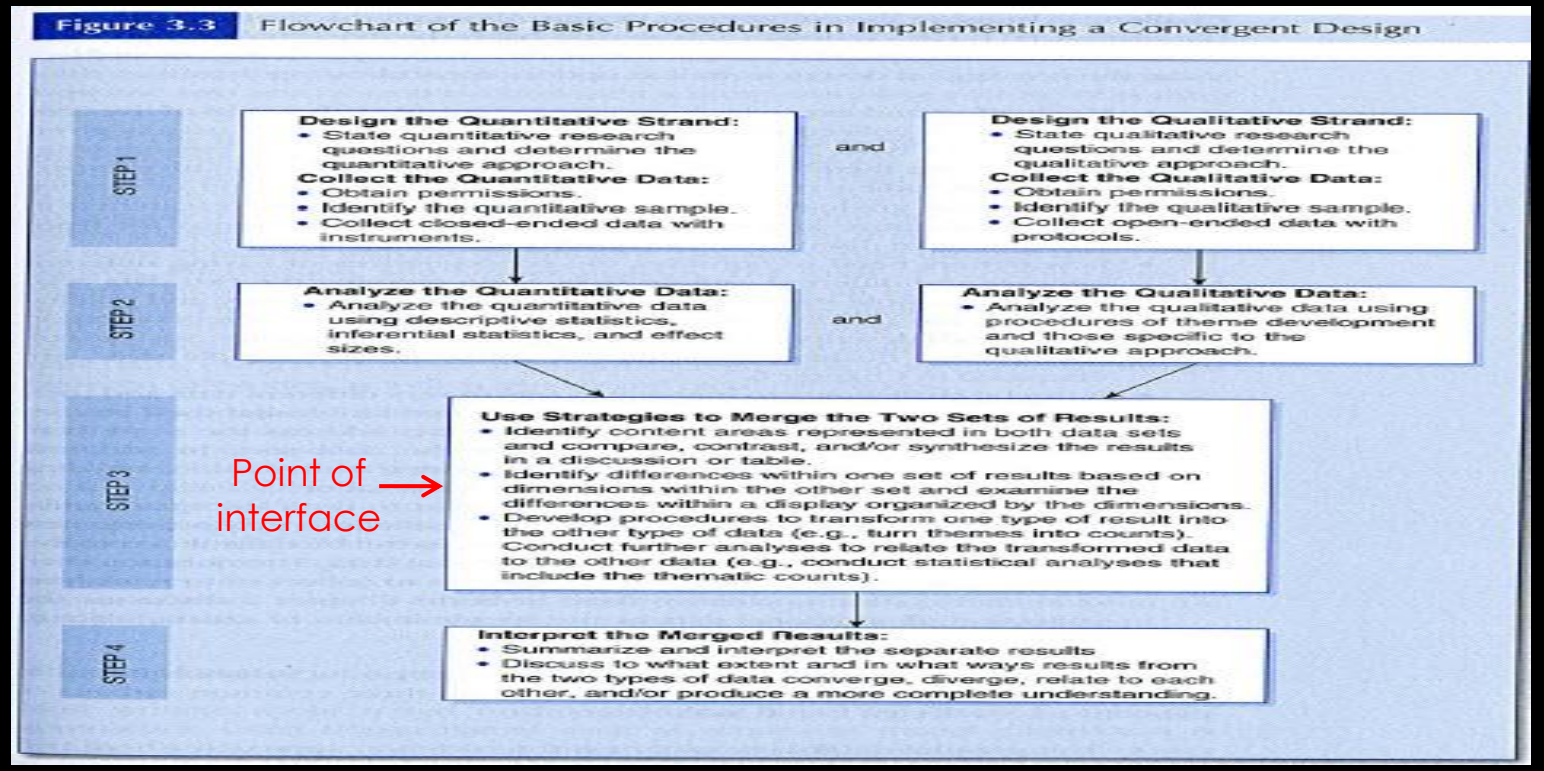
- Key points
  - Collect and analyze two independent strands of quantitative and qualitative data at roughly the same time/ in a single phase.
  - Prioritize the methods equally.
  - Keep the data analysis independent.
  - Mix the results during the overall interpretation.
  - Try to look for convergence, 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.
    - Parallel questions mean the same concepts need to be addressed in both data collections.

CONVERGENT PARALLEL DESIGN

- Samples: different or same group of people in quantitative and qualitative studies?
  - Can be same group of people
  - Or different group of people

CONVERGENT PARALLEL DESIGN

- Design
  - Samples:
    - If the purpose is to combine information on a topic from different views, use different group of participants.
    - If the purpose is to compare, corroborate, or relate two sets of findings, use same group of participants.

CONVERGENT PARALLEL DESIGN

- Design
  - Sample sizes: equal or unequal
  - Equal sample size
    - Large equal sample size may sacrifice some of richness of the qualitative data.
    - Small equal sample size may sacrifice the use of rigorous statistical tests.

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

- Side by side comparison

Figure 7.1 Excerpt From a Results Section Showing a Side-By-Side Comparison of Quantitative and Qualitative Data Results

Present QUAN result	Overall, certain elements were consistently considered to have a great or considerable impact on coalition success, regardless of how success was defined. "Commitment to goal/cause/issue" (95.0 percent) and "competent leadership" (92.5 percent) were the top two elements regardless of definitions of success, followed by "commitment to coalition unity/work" (87.5 percent), "equitable decision-making structure/process" (80.0 percent), and "mutual respect/tolerance" (77.5 percent). Additional important elements of success were having "a broad-based constituency" (75.0 percent), "achieving interim victories" (72.5 percent), "members' continued contributing resources" (67.5 percent), and "shared responsibility and ownership" (65.0 percent). Note that the tangible elements relating to resources (staffing and funding) were given much less import overall. Only three external factors were deemed important by most coalition leaders: "the right timing" and selecting a "critical issue" (at 87.5 percent each), and "appropriate target" (71.5 percent). Whereas coalition leaders cannot control these factors as much, it is clear that these factor into the decision-making processes with respect to the framing of goals and strategies:
Present corresponding QUAL result and relate to QUAN result	The resources amassed by our coalition are valued and respected. They [the members] all possessed tremendous knowledge about their subject areas and about the political process. Being recognized as experts gives the coalition leverage and clout with the target.

CONVERGENT PARALLEL DESIGN

- Another side by side comparison strategy: use a summary table that merges the findings from both components.

CONVERGENT PARALLEL DESIGN

Side-by-side comparison

Comparison of Information from Interview and Survey Data: Examples of Four of the Eight Themes

Major Topics

Theme	Face-to-face Interviews (QUAL results)	Telephone Survey (QUAN results)
1. How and why child was placed in program	Two aspects of decision: (1) Community-based "inclusive" option (2) Specific child care center Factors affecting choice: • Visited and liked classroom & teacher • Convenience of location • Flexibility in hours • Good reputation of center • Concern if center would accept child because of behavior	Parents' most important reasons for using program: • Offers special education services or therapies • Provides opportunities for child to learn • Provides opportunities to play with other children
2. Program's appropriateness for child	In successful placement, there is a "match or fit" between child's and family's needs & program. Factors affecting match or fit: • Acceptance by staff & children • Likes activities and routines for child • Child likes program • Sees benefits or specific improvements	• 90% said very important for child to be in inclusive program • 80% indicated child usually or always receives special services needed • 86% were satisfied with way in which child's educational goals were made
3. Helpful and unhelpful players	Characteristics of helpful players: • Consistent presence over time & settings • Personal investment in child • Provides different types of support • Dependable source of information about child Characteristics of unhelpful players: • Minimize or disregard family concerns • Inadequate communication	The most helpful supports were: • Other family members at home • Child's teachers • Other professionals in community and at child's program
4. Child's participation in family and community activities	Factors that affect participation: • Parent's safety concerns about child • Parent's perception of what is expected of child's behavior • Lack of other young children in immediate neighborhood • Family's own style, schedule, and how it participates in the community • An extended family system was so strong a part of family's culture that family did not need or choose to participate much in the community • Young age of children	Limitations on participation: • Child's language skills • Family's schedule and time constraints • Attitudes of others towards child's disability • Child's behavior • Lack of other children to play with in neighborhood

CONVERGENT PARALLEL DESIGN

- Merged data analysis strategies
  - Joint display: using a table or figure to show both quan and qual results.

CONVERGENT PARALLEL DESIGN

Joint display

Dimension: QUAL themes

Dimension: QUAN categories

Top Three Strengths from the Gallup StrengthsFinder	Qualitative Themes: Relationship-Building Strategies	Qualitative Themes: Strengths Awareness	Qualitative Themes: Relationship Outcomes
Input ($n = 8$)	24 Chilling out. Talked a little bit.	15 Talked about results. Talked about the awkwardness of strengths terminology.	55 We saw an increase in comfort. Conversations got noticeably easier.
Relator ($n = 6$)	32 "How is your week going" conversations. Hot-button conversations.	13 Talked about strengths in a casual manner. Discussed being positive, in a good mood.	13 A special relationship developed between us. We went through an early period of discomfort. Early conversations were superficial.
Achiever ($n = 5$)	22 Talked about our lives. Trusted me with personal information.	3 It was cool to hear about other people's strengths. I notice my strengths in everyday life. Watching a movie helped us to reflect on strengths.	3 The early project jitters are going away. We're not hanging out because we have to. We learned new things about ourselves.

CONVERGENT PARALLEL DESIGN

- Merged data analysis strategies
  - 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

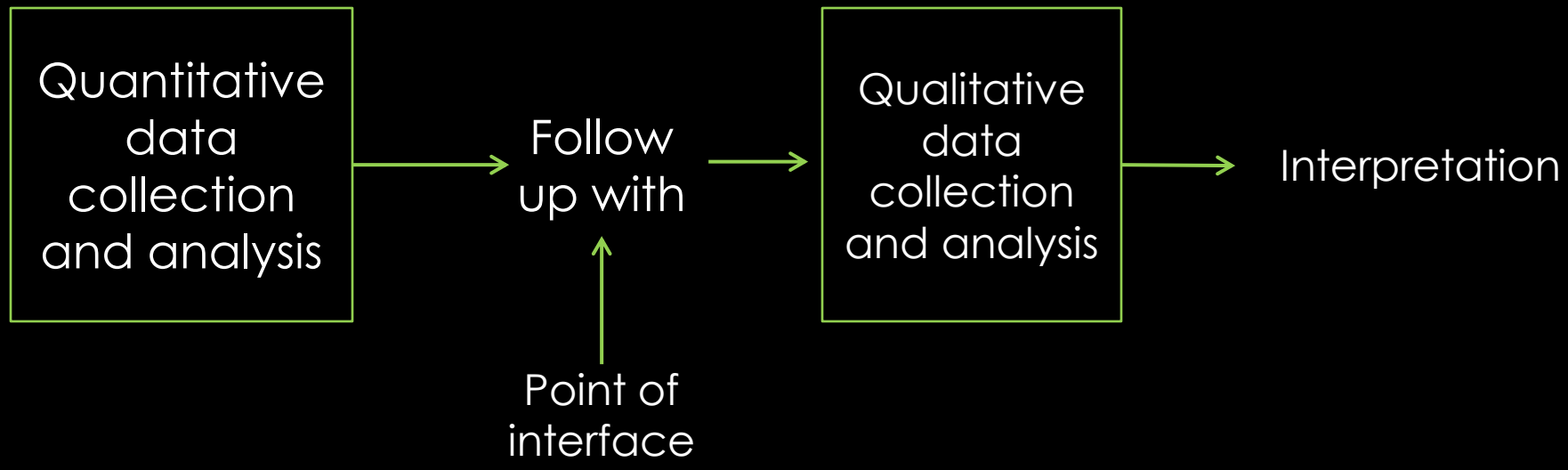
- Convergent parallel design variants
  - Parallel-databases variants: two sets of results merge during interpretation, how results from both components show a complete picture of study interest.
  - Data-transformation variant
  - Data-validation variant: such as open-ended questions on a questionnaire is used to validate or confirm the results from close-ended questions.

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

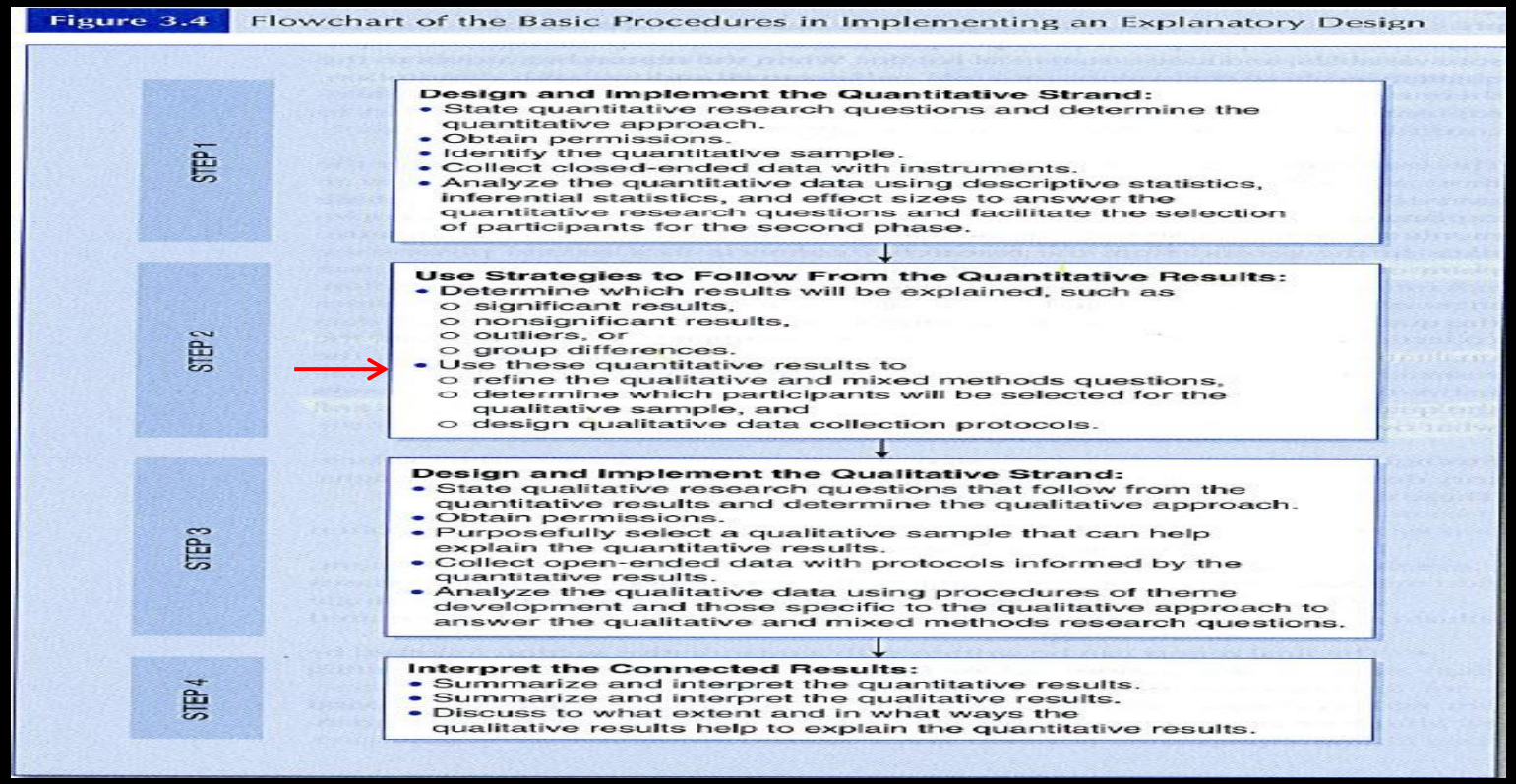
- Procedure
  - First, collect and analyze quantitative data.
  - Identify specific quantitative results that need additional explanation.
  - Design qualitative study based on what learn from quantitative results.

EXPLANATORY SEQUENTIAL DESIGN

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

MIXED METHODS RESEARCH

- Explanatory sequential design: procedure



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.

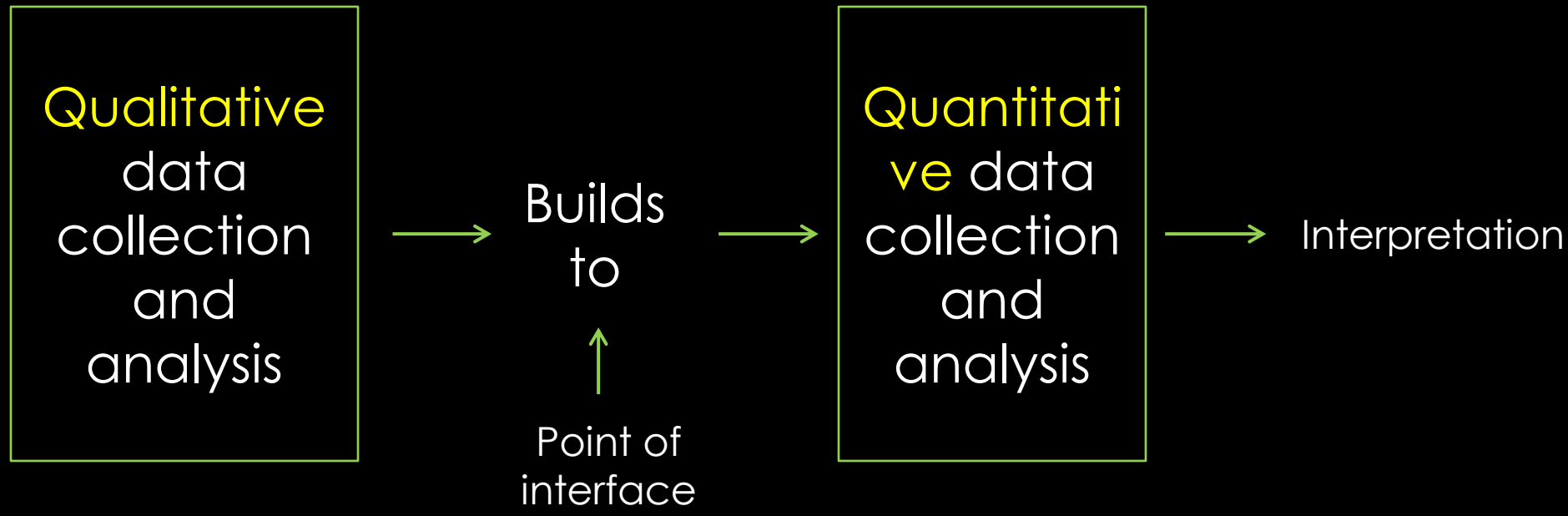
EXPLORATORY SEQUENTIAL DESIGN

- 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

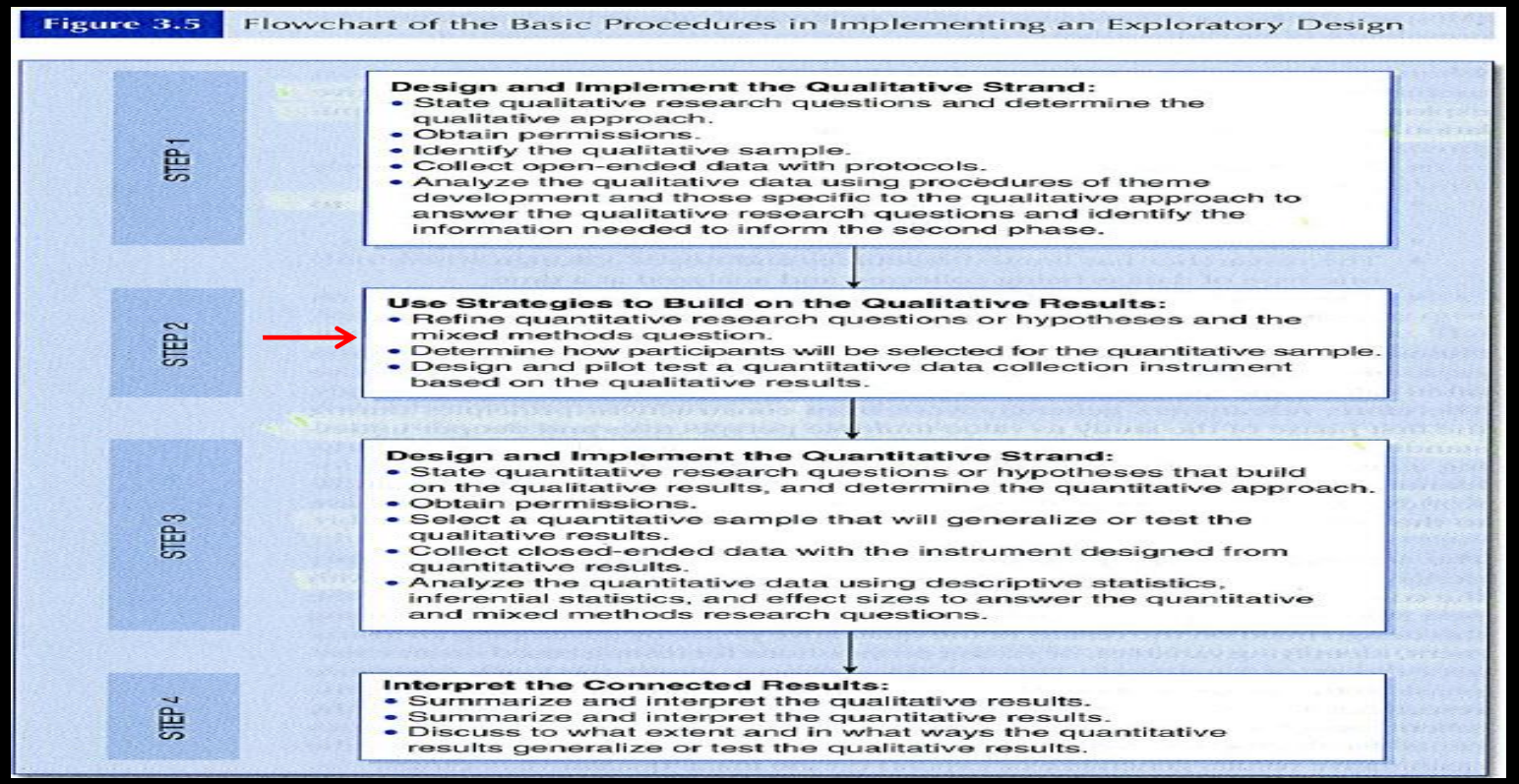
- Mixed design research question
  - In what ways do the quantitative results generalize the qualitative findings?

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

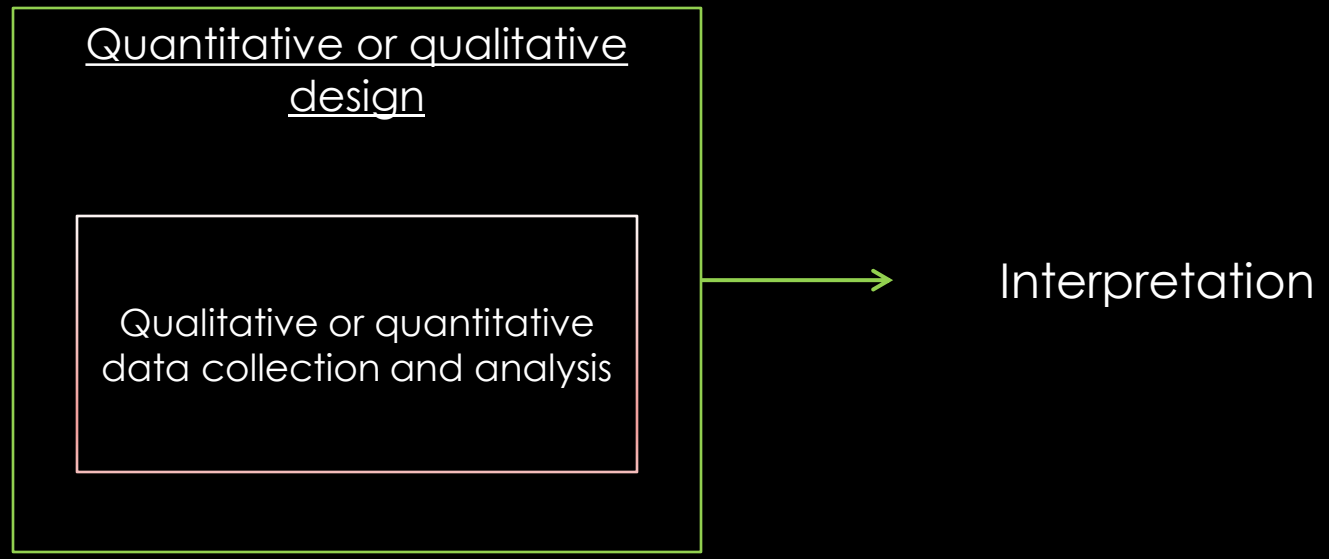
- Exploratory sequential design variants
  - Theory-development variant: test emergent theory
  - Instrument development variant: initial qualitative phase plays a secondary role.

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

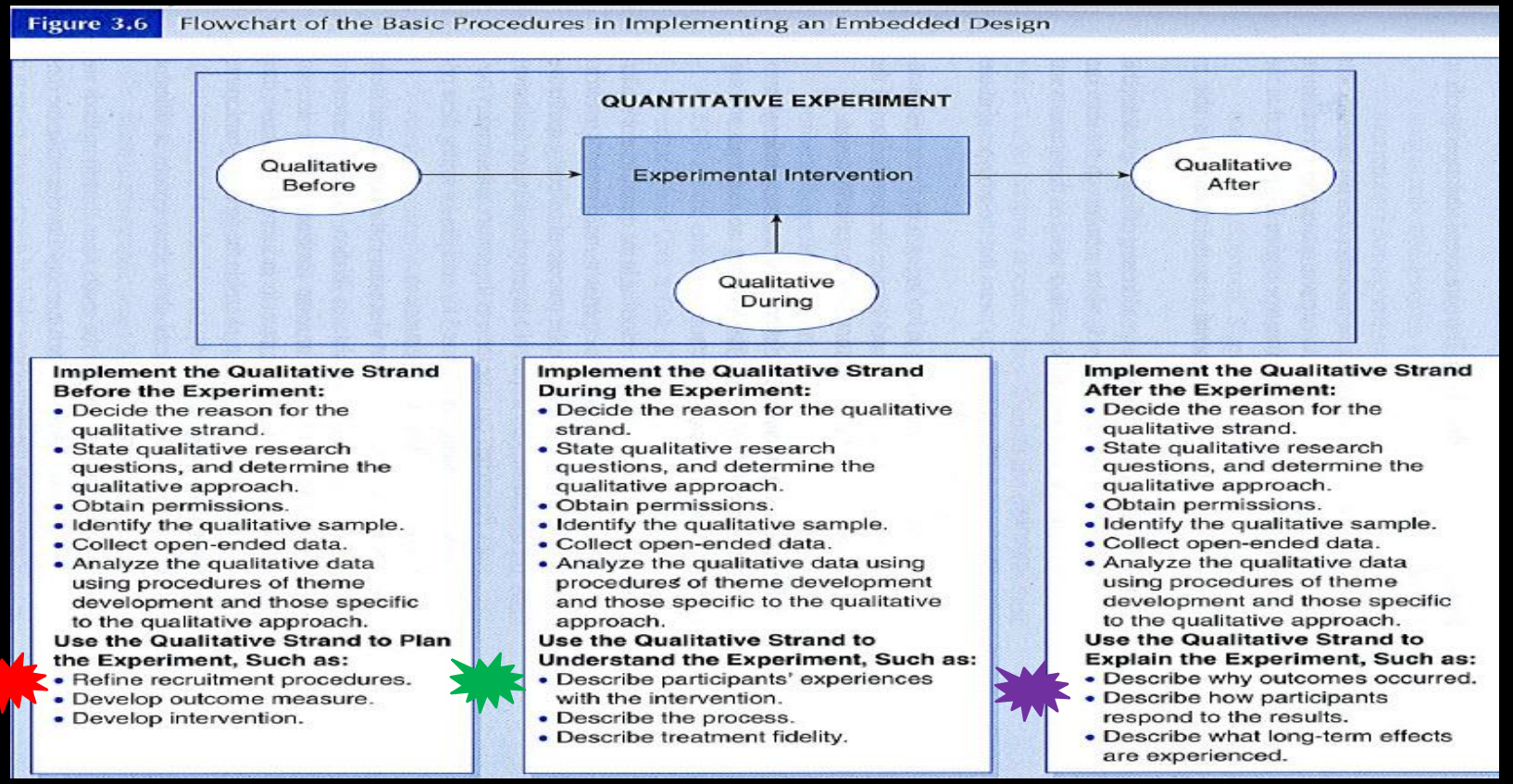
- Embedded design
  - A quantitative or qualitative data collection is within a quantitative or qualitative procedure.
  - A single data set is not enough.
  - Two types of data answer different research questions.
  - The collection and analysis of the second data set may occur before, during, and/or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



MIXED METHODS RESEARCH

- "Treatment fidelity refers to the methodological strategies used to monitor and enhance the reliability and validity of behavioral interventions."

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

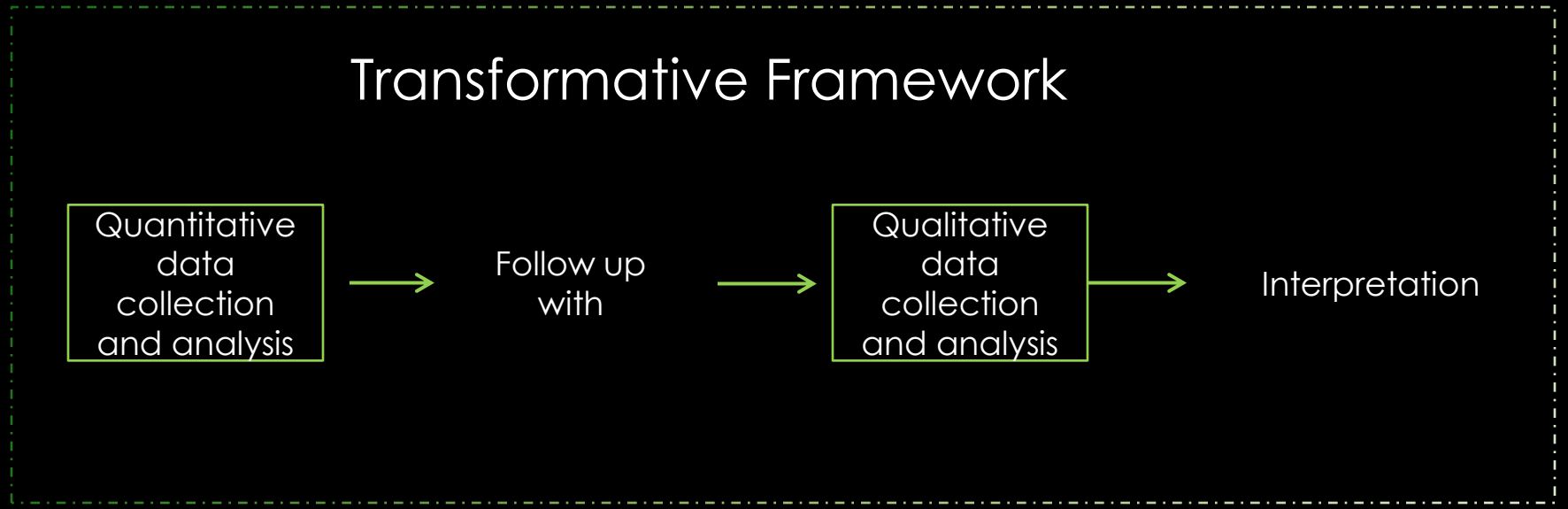
- Published paper
  - Victor, C. R., Ross, F., & Axford, J. (2004). Capturing lay perspectives in a randomized control trial of a health promotion intervention for people with osteoarthritis of the knee. *Journal of Evaluation in Clinical Practice, 10*(1), 63-70.

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

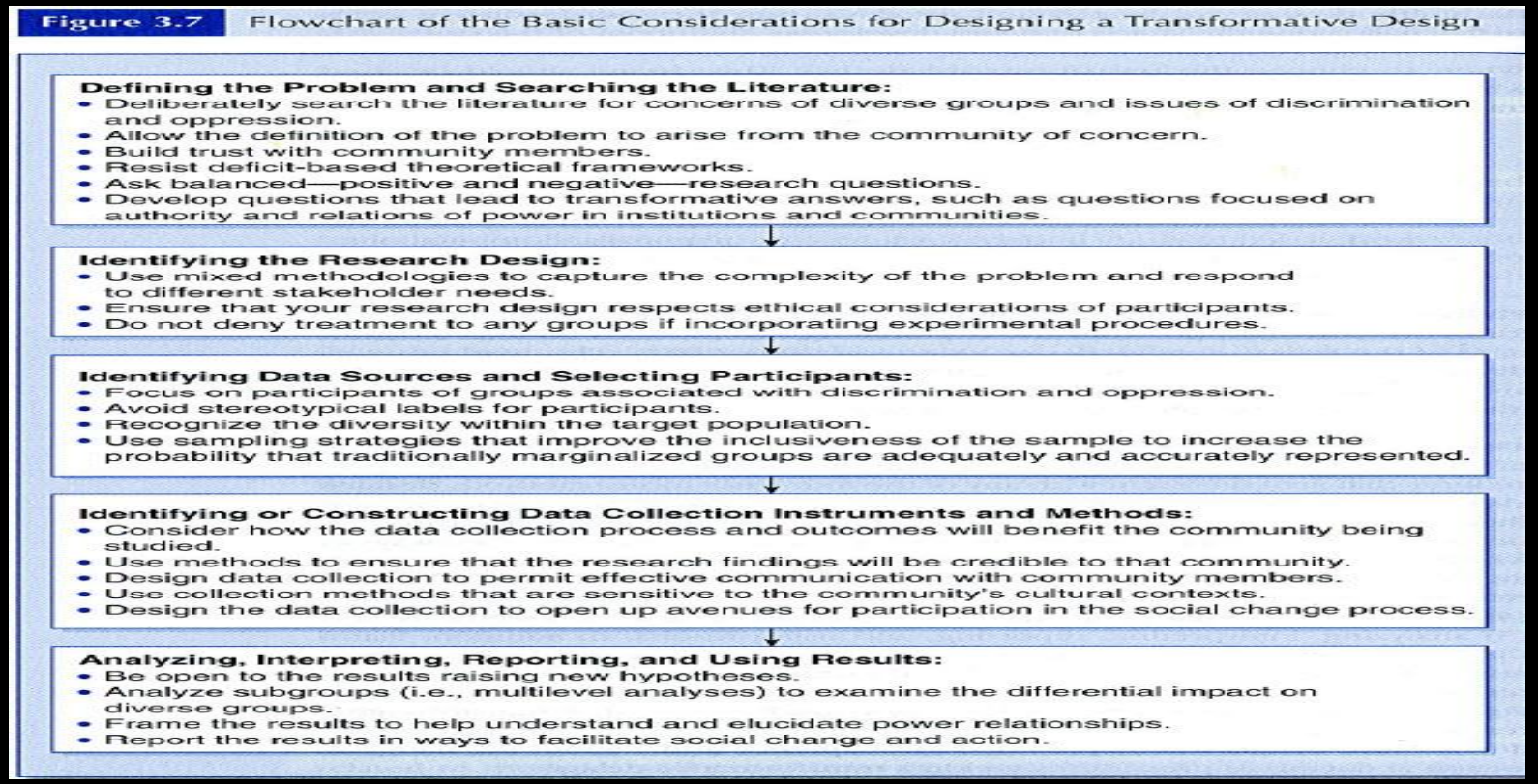


Figure 3.7 Flowchart of the Basic Considerations for Designing a Transformative Design

Defining the Problem and Searching the Literature:
- Deliberately search the literature for concerns of diverse groups and issues of discrimination and oppression.
- Allow the definition of the problem to arise from the community of concern.
- Build trust with community members.
- Resist deficit-based theoretical frameworks.
- Ask balanced—positive and negative—research questions.
- Develop questions that lead to transformative answers, such as questions focused on authority and relations of power in institutions and communities.

↓

Identifying the Research Design:
- Use mixed methodologies to capture the complexity of the problem and respond to different stakeholder needs.
- Ensure that your research design respects ethical considerations of participants.
- Do not deny treatment to any groups if incorporating experimental procedures.

↓

Identifying Data Sources and Selecting Participants:
- Focus on participants of groups associated with discrimination and oppression.
- Avoid stereotypical labels for participants.
- Recognize the diversity within the target population.
- Use sampling strategies that improve the inclusiveness of the sample to increase the probability that traditionally marginalized groups are adequately and accurately represented.

↓

Identifying or Constructing Data Collection Instruments and Methods:
- Consider how the data collection process and outcomes will benefit the community being studied.
- Use methods to ensure that the research findings will be credible to that community.
- Design data collection to permit effective communication with community members.
- Use collection methods that are sensitive to the community's cultural contexts.
- Design the data collection to open up avenues for participation in the social change process.

↓

Analyzing, Interpreting, Reporting, and Using Results:
- Be open to the results raising new hypotheses.
- Analyze subgroups (i.e., multilevel analyses) to examine the differential impact on diverse groups.
- Frame the results to help understand and elucidate power relationships.
- Report the results in ways to facilitate social change and action.

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

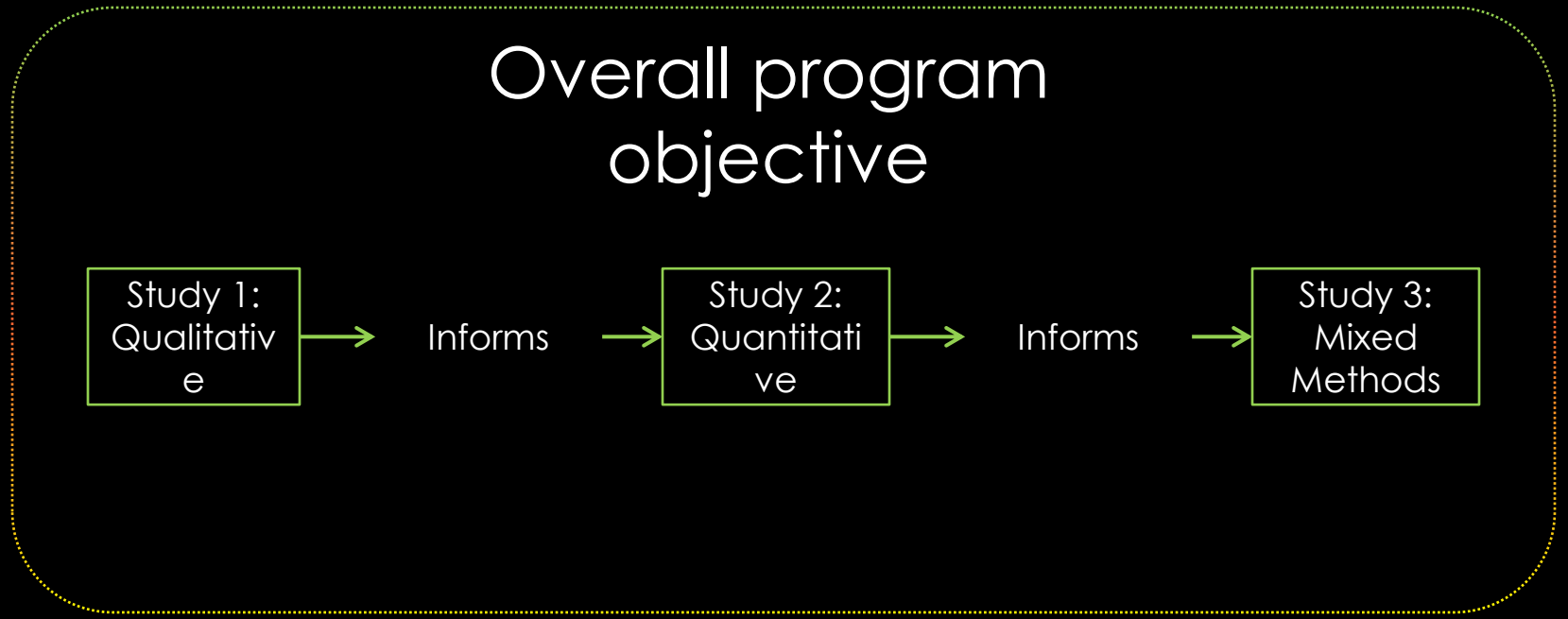
- Transformative design variants
  - Feminist lens transformative variant
  - Disability lens transformative variant
  - Socioeconomic class lens

MIXED METHODS RESEARCH

- Major designs
  - (6). Multiphase: is 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

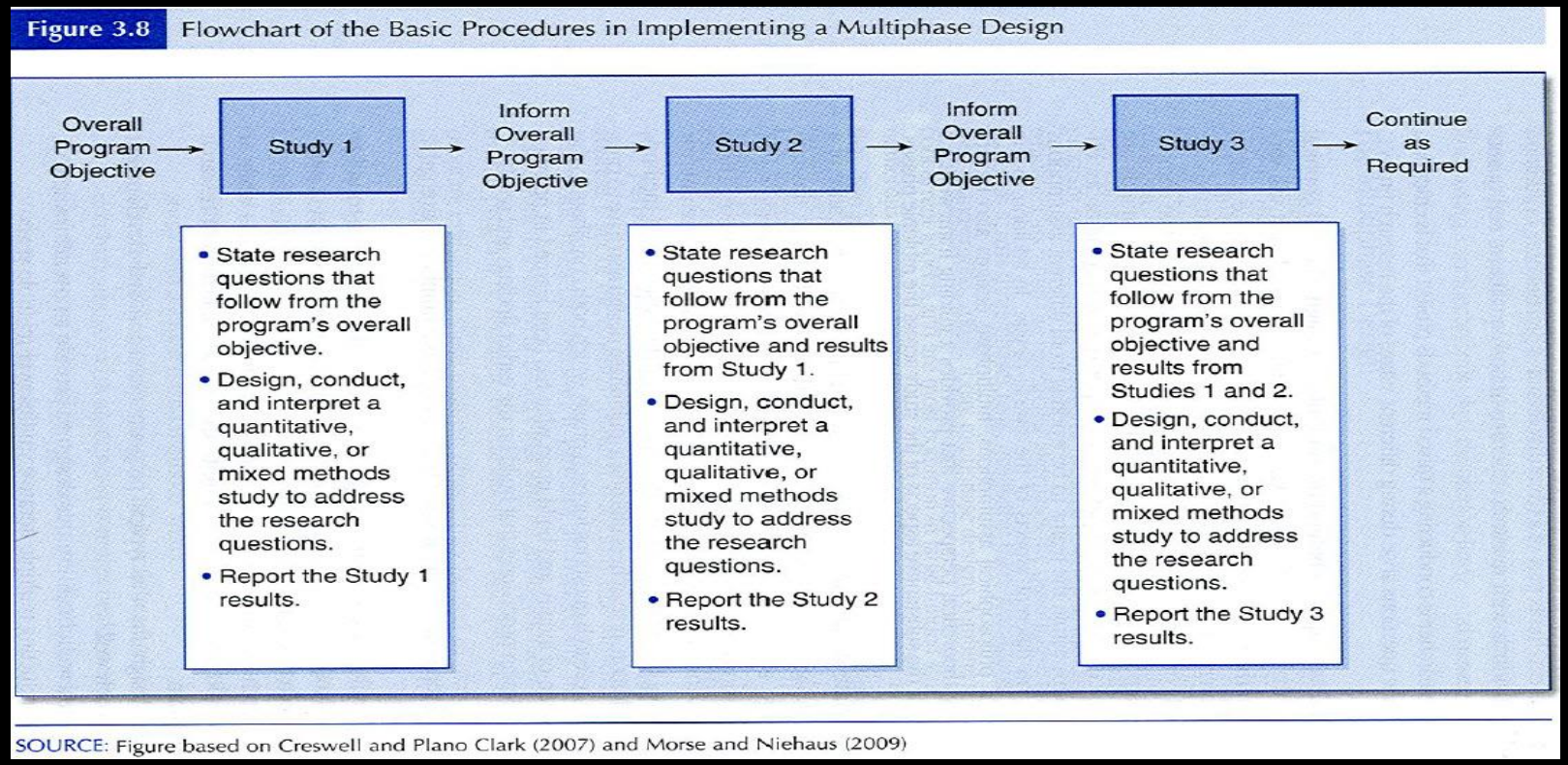
- Multiphase design



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 study that combines 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