“It is better to be roughly right than precisely wrong.”

-- John Maynard Keynes
Overview of the Research Process

1. Problem formulation
2. Methodology
   - Operationalization and measurement
   - Study population and sampling
   - Research design
   - Data collection
   - Data analysis plan
3. Implementation – Data collection
4. Data analysis
5. Dissemination
MEASUREMENT

Ways to measure/categories
Evaluating measures
Errors in measures
Sensitivity to diversity and culture
Avoid measurement errors
Using existing scale
Ways of Measuring

Categories of Measurement (Examples):

- Nominal (gender, ethnicity)
- Ordinal (grading from A to F)
- Interval (FICO scores, intelligence scores)
- Ratio (age, income, # of visits)
Example:

Variable: Socioeconomic status

* Nominal: Are you able to make ends meet every month? (yes/no)
* Ordinal: Poor, low-income, middle-income, high-income
* Interval/Ratio: actual income in dollars ($)
Ways of Measuring

More than one indicator?

- Single Items
- Scale (Index): composite/ cumulative measures
  - Likert scale
Techniques of measuring

- Verbal report
- Observation
- Archival records

❖ Triangulation
Using Existing Scales and Indexes

- Popular way to operationally define variables
- Saves time and money
- Always consider the quality of existing scales and indexes – esp. reliability
- Reliability alphas run from 0 to 1.0 (high)
Evaluating Measures

Validity
  o  Accuracy

Reliability
  o  Consistency or stability
Evaluating Measures

Relationship between reliability and validity

- Reliable, not valid
- Neither reliable nor valid
- Both reliable and valid
Errors in Measurement

Random errors
- Errors by chance
- Neither consistent nor patterned
- Related to *reliability*

Systematic errors
- Consistent and patterned errors
- Related to *validity*
- Bias
  - Predisposing way of asking question
  - Social desirability
  - Cultural bias
Sensitivity to Diversity in Measurement

- Refine measurement, if necessary
- Use culturally sensitive measures
  - Use key informants
  - Translation-back translation
  - Pilot testing
Culturally Competent Research: being aware of and appropriately responding to the ways in which cultural factors and differences should influence what we investigate, how we investigate, and how we interpret our findings.

- *Research participants:* NIH mandates that research projects must include adequate representation of women and ethnic minority groups
- *Measurement:* Should be shown to be reliable and valid for population to which it is being applied
- *Data Analysis:* Need cultural sensitivity to analyze and interpret results
Avoiding Measurement Errors

- Use unbiased wording
- Use understandable terms
- Obtain collegial feedback
- Pilot testing
- Triangulation
- Training interviewer/observer
Recruiting and Retaining Participants

- Obtain endorsement from community leaders
- Use culturally sensitive approaches regarding confidentiality
- Employ local community members as research staff
- Provide adequate compensation
- Alleviate transportation and child-care barriers
- Choose a sensitive and accessible setting
- Use and train culturally competent/bilingual interviewers
Engage community representatives in formulation of questions and development of study

Don’t assume instruments will be valid

Look for ways findings differ by groups

Keep a strengths-based focus

Don’t generalize from one group to another

Consider history as it may affect involvement, attitudes and participation in research