Measurement

ScWk 240 -- Week 4 Slides

"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

Ways of Measuring

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)
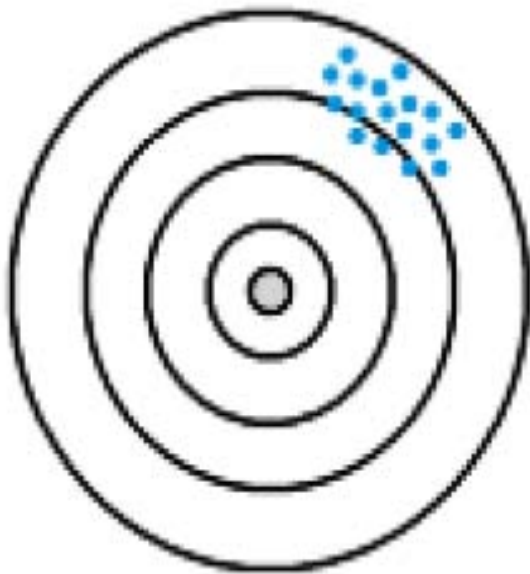
Evaluating Measures

Validity

   o Accuracy
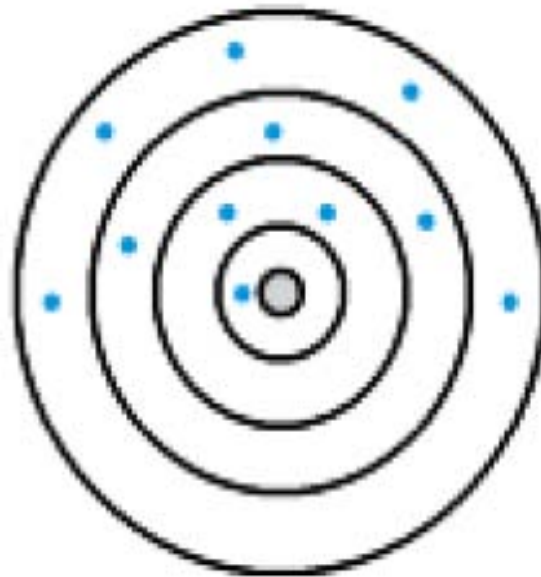

Reliability

   o Consistency or stability
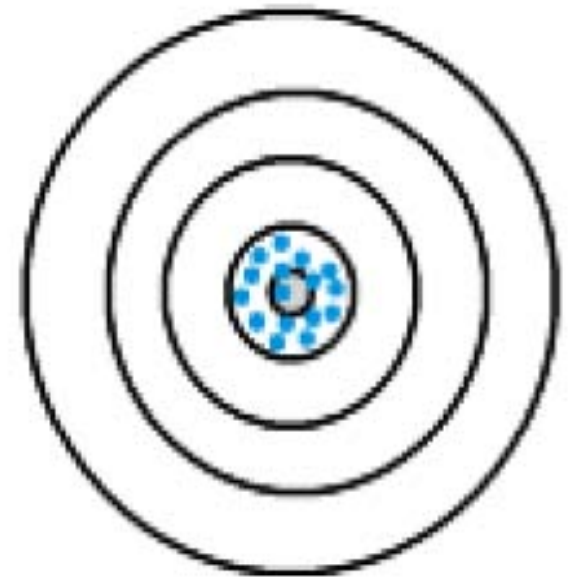
Evaluating Measures

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

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

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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

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Cultural Competence in Research

* 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