Research Design Re-visited

- Introduction (grab reader's attention)

- Review of literature including theory
  --hypothesis development

- Methodology for testing accuracy of
  hypotheses. This requires:
  --identifying the concepts
  --operationalizing them so they can be
  measured

Types of Concepts

1. <u>Direct observable</u> things that can be observed simply and directly. (for example: put to death or not put to death)

2. <u>Indirect observable</u> things that require more subtle observations. (example: sex educ in schools by examining books used)

3. <u>Constructs</u> based on observations that can not be observed. (prejudice)
    --something we create, cannot be seen
    --must control for ambiguity in language
    --must be clear

Conceptualization

- Process of specifying what we mean when we use particular terms.

- Produces an agreed upon meaning for a <u>concept</u> for the purposes of research. Requires either a nominal or operational definition:

- **<u>Nominal Definition</u>**: A conventional definition (example: sex, age, Department of Labors list of occupations to measure "occupation", (e.g., doctor, lawyer, bricklayer)

- **<u>Operational Definition</u>**: Describes precise, specific <u>indicators</u> or <u>variables</u> and their <u>attributes</u> that will be used to measure the concepts.

  Example: if concept is "prejudice," operational definition might be list of questions found to effectively reflect a person's level of prejudice

Circularity of Variable Names

- Once you have a measure using an operational definition, you may need to rename the concept

- Example: if <u>alienation </u>is measured with questions about feelings of powerlessness then perhaps the concept should be <u>powerlessness</u>.

Development of Attributes

- Attributes must be <u>exhaustive</u> (example: all ages included for a measure of age)

- Attributes must be <u>mutually exclusive</u>—an element can't fit into two different attributes (for example: if the attributes were income of (1) $0 – $20,000 or (2) $20,000 or greater, $20,000 would fit in both.

Four Levels of Measurement

LoM determines what types of numerical analyses can be done. The higher the level of analysis the more sophisticated the analyses.

1. **Nominal** – no order, offer names for labels for characteristics (gender, birthplace).

2. **Ordinal** - variables with attributes we can logically rank and order.
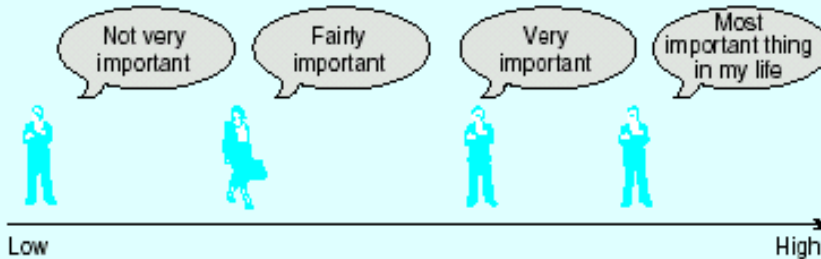
Four Levels of Measurement

3. **Interval –** distances separating attributes has meaning (temperature scale).

4. **Ratio** - attributes composing a variable are based on a true zero point (age). Can determine how much one attribute differs from another (example: twice as old). --examples of ratio variables are age, length of employment, times attended church
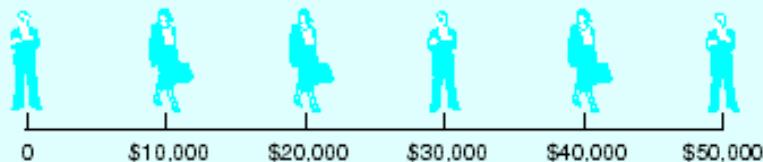
Levels of Measurement

Measurement Quality

- <u>Precision</u> and <u>accuracy</u> of attributes

- <u>Reliability</u>—use the same measurement technique you should get the same result each time
--example of low reliability: have observers watch workers on Mondays and give workers a score on job satisfaction
--example of high reliability: use turnover to measure level of job satisfaction

Measurement Quality

Ways to test for reliability

1. <u>Test-retest method</u> - take the same measurement more than once. For example: three months later ask same question again and see if get same answer (only where answer should not have varied such as age)

2. <u>Split-half method</u>--take the same measurement more than once.

3. Use established measures.

4. Check reliability of research-workers contacting respondents
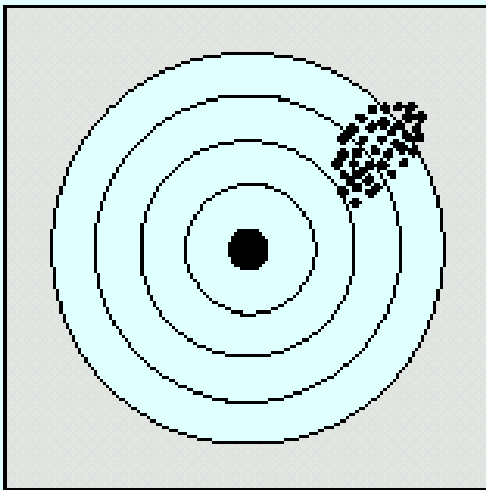
Validity

Are you measuring what you think you are measuring?

Example: If you want to measure job satisfaction are you sure this is what you are measuring and not something like commitment to the work.
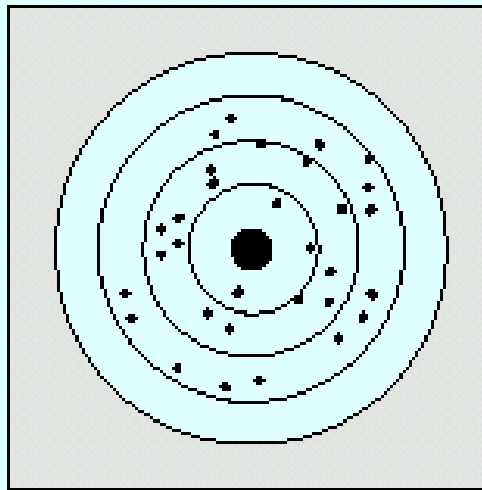
Types of Validity

- <u>face validity</u>

- <u>criterion-related validity</u>
  --predictive validity—relates to an external criterion
  --not theoretical—SAT is related to college graduation

- <u>construct validity</u>
  --logical relationship between two variables
  --theoretical—example: one satisfied w/ marriage less likely to cheat on spouse

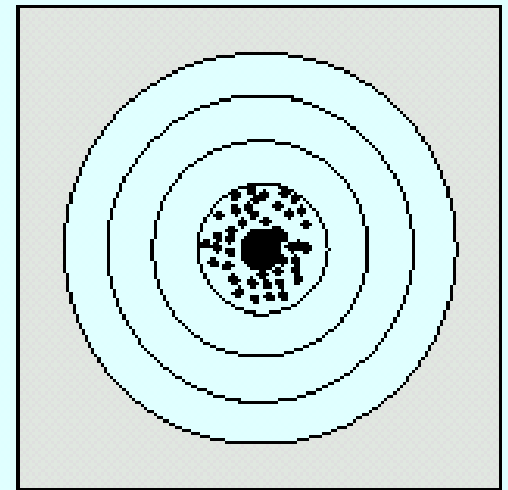- <u>Content validity</u>—are all dimensions of the concept measured

Analogy to Validity and Reliability

Reliable but not valid   Valid but not reliable   Valid *and* reliable

Tension Between Reliability and Validity

- Qualitative (ideographic) vs Quantitative (nomothetic)

- Observing is more valid but counting is more reliable