Week 3 lecture notes - PSYC 3435

Jan 30-Feb 3, 2017

Building a good research question

- Suppose we want to claim that people perform best with a good night of sleep

  1. must FOCUS the idea
     - break more general idea into smaller, more specific ideas
       * what do we mean by "performance" – academic? physical?
       * what do we mean by "good night of sleep" – 8 hours? uninterrupted? 3 hours of REM?
     - develop underlying theoretical model
       * since consolidation of memories happens during REM sleep, we can predict that getting more REM sleep should lead to better recall
  2. must EVALUATE the idea
     - ROT test – is it:
       * replicable?
       * observable?
       * testable?
  3. TEST the idea
     - what are the variables of interest?
     - what is the hypothesized relationship between these variables?
     - how should we test it?

Some definitions

- Operational definition - a definition of an abstract concept that is formulated in terms of how the concept is being measured

    - Example: define "memory ability" as score on a memory test

- External validity - the degree to which results of a study apply (generalize) to individuals/behaviors outside context of the study

- Internal validity - the degree to which a study provides **causal** information about behavior

- Reliability - the degree to which the results of a study can be replicated under similar conditions

General research methods

1. Naturalistic observation: observation and description within a natural setting

    - high external validity
    - hard to do well
        - reactivity effects
        - takes a long time
        - need multiple observers

2. Survey methods – questionnaires/interviews that ask people to provide information about themselves

    - widely used
    - best way to collect particular kinds of data (descriptive data, preferences, etc.)
    - large amounts of data very quickly
    - difficult to do correctly with high validity

3. Archival data - examine existing public/private records

4. Note: these are all called "observation without manipulation"

    - Advantages:

(a) can observe complex patterns of behavior

(b) useful when little is known about subject of study

(c) may learn something new that would never have been predicted

- Disadvantages:

(a) cannot establish causality

(b) threats to internal validity
  - lots of "confounds"
  - lots of alternative explanations

(c) sometimes results are not reproducible

5. Correlational methods – measure two (or more) variables for each individual and see if the variables co-vary (suggesting they are related)

- used for
  - making predictions
  - establishing reliability and validity
- problem: cannot make causal claims!

6. Experiments – manipulating and controlling variables in laboratory experiments

- involves some type of comparison
  - at least two groups that get compared (random assignment to groups)
  - quasi-experiment - groups NOT randomly assigned
- types of variables
  - Independent variable (IV) – variable that is manipulated
  - Dependent variable (DV) – variable that is measured
  - Control variable – held constant for all participants in experiment (either through explicit control or randomization)