Research Methods II

Recap
- Characteristics of the scientific process
- Warning signs of “bad” science

Goals
- Research designs, pros and cons
- Key measurement concepts in research-based OB
Research designs

- Qualitative vs. quantitative
- Experimental vs. correlational

Qualitative research

- Pros
  - “Rich” data – highly descriptive
  - Can be used when quantitative methods can’t
  - Naturalistic, “big picture” view

- Cons
  - Often exploratory
  - Harder to generalize results

Quantitative research

- Pros
  - Generalizable
  - Easier to replicate, compare results
  - Allows use of statistical models, measures of association
    - “All models are wrong, but some are useful.”

- Cons
  - May “hides” subjectivity, assumptions about construct
Experimental research

- Cause and effect
  - Cause must precede effect
  - Cause and effect must co-vary
  - No plausible alternative explanations
    - (e.g., “third variable” problem)

A \rightarrow B

Experimental research

- Experiment
  - A controlled procedure where we examine the effects of varying conditions on outcomes of interest

Experimental research

- Pros
  - Great for identifying cause-and-effect (gold standard!)

- Cons
  - Must be able to manipulate the predictor variable – not always possible
  - Can be hard to identify, control for all third-variable effects
Correlational research

- Pros
  - Good for dealing with lots of different variables simultaneously
  - Good for identifying potential cause-effect relationships

- Cons
  - "Correlation is not causation"

Newer research methods

- Simulation-based (computational modeling)
  - Allows for "virtual experiments"
    - Take theoretical model
    - "Manipulate" variables
    - Simulate outcomes
    - Refine simulation based on real-world experiments
  - Widely used in economics, political science, epidemiology
  - Gaining popularity in psychology, management

Measurement

- Definition: imposition of units to observations

- "Good" measurements are
  - Reliable
  - Valid
Reliability

- Consistency of measurement

- Types
  - Test-retest reliability
  - Internal consistency reliability

- Necessary (but not sufficient for) validity

Validity

- Are the inferences drawn from our measures appropriate?

- Sources of evidence for validity
  - Content-related validity
  - Criterion-related validity
  - Construct-related validity

- “Face” validity

Measurement validity

- Content-related validity
Measurement validity

- **Content-related validity**
  - Deficiency

- **Contamination**

- **Relevance**
Measurement validity

- **Criterion-related** validity
  - Concurrent and predictive

- **Construct-related** validity
  - Discriminant and convergent

- “Face” validity