Threats to Internal Validity

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Internal Validity

- ***Internal validity*** refers to the confidence that any difference in observed outcomes can be attributed to whatever "treatment" you've given, not to any other ***extraneous variables***
- Note: if the association between your IV and DV is zero, you still have to worry about whether some other variable is masking an association between the IV & DV.
  - Eg. Subway “misdirection” experiment – what if environmental factors confound the reactions to each trial?

Experimental Control

We have discussed two types of threats to internal validity already:

- Control ***setting effects*** by keeping all procedures the same except the independent variable
- Control ***subject effects*** by randomly assigning subjects to different treatments – this is what differentiates a “true” experiment from a quasi-experiment

But…. There is Third Series of Threats to Internal Validity

Experimenters still worry that instead of the independent variable, ***the process of going through the experiment*** might account for the subject's response.

Threats to Internal Validity

- History
- Maturation
- Testing Effects
- Instrumentation
- Selection
- Attrition

History

- Events going on in the context of the experiment that might influence the subject's response
  - Either ongoing social & political events
    - Eg. War → attitudes to people with non-American accents
  - A minor event that occurs over the course of the experiment
    - Eg. Taylor/Amy/Jackie's Firetruck story

Maturation

- Psychological or physical changes might occur simply with the passing of time, regardless of the "treatment" given by experimenters
  - Eg. Medical studies – people get better naturally
  - Psych studies – people change the way they think as they mature
- Controlled by comparing with other groups experiencing the passage of time; by reversing order of treatments for different groups; using ABA design

Testing Effects

- Changes in what is being measured that are brought about by reactions to the process of measurement
  - E.g. If tested repeatedly, give more socially/psychologically accepted answers on later tests
  - E.g. stress & mice – caught by proper control groups

Instrumentation

- Unwanted changes in the measuring instrument
  - Usually applies to human observers, who become more skilled, more bored, less observant
  - Or when different observers are used to obtain measurements at different times – eg. Halfway through grading a test, switch graders.

Selection

- When there are systematic differences between the “treatment” and “control” groups
- Especially likely in quasi-experiments when studying naturally occurring groups
  - Eg. Recovering alcoholics in AA vs. in hospital treatment

Attrition

- Attrition: Loss of subjects from experimental groups – over time people drop out
- Worse when people drop out of different treatment groups at different rates → undermines random assignment to groups
  - E.g. “escaping” from the TV camera more than the radio mic

Requirements for Assignment

- In your experimental design paper, you must list extraneous variables that might plausibly affect your dependent variable
- Discuss:
  - which ones are controlled by being held constant,
  - which ones are controlled by being randomized,
  - which ones remain possibly uncontrolled.

  ***** You need to give specific examples of variables relevant to your particular experiment to get full credit, not vague answers**
- A paper that does everything in the experiment right EXCEPT has errors in the "internal validity" section will get a B. The internal validity section is distinguishing the highest grades from the rest, but you can still do OK even if you mess it up.

Goals for Today: Write this Down!

1. Your plan for selecting subjects
2. Your plan for a manipulated IV: what are different treatments? How will you execute each one?
3. Your plan for randomly assigning subjects to a treatment
4. Your plan for classifying responses to the treatment (think ahead: what will be possible responses, & how will you measure them?)
5. Your plan for any questions you might get asked by subjects
6. Your plan for controlling setting, if doing it outside – how will you make sure you are unobtrusive? How will you make sure bystanders don't clue in & interfere?
7. Your plan for debriefing subjects, if necessary (if you don't think it's necessary, write down why not)
8. A list of **extraneous** variables that might account for subject reactions