Chapter 8

Experiments

The Classical Experiment

- Pretesting: Measure dependent variable before the introduction of stimulus (i.e., independent variable)
- Posttesting: Measure DV after introduction of stimulus (IV)
- Experimental group: Presented with IV
- Control group: Not presented with IV

Step 1: Selecting Subjects

- Probability sampling usually avoided – too expensive and time-consuming to transport large representative sample to physical site of an experiment
- Instead usually use non-probability sampling (e.g., convenience sampling)
- Ex: Web-based Experiments = experiment where sample gathered from people who respond to online invitation

Step 2: Dividing sample into two groups

- Randomization = randomize who goes in each group by assigning people in the sample ones or twos; ones go in a group and twos go in the other group (better with larger sample)

- Matching = match characteristics of the two groups (better with small sample) – this is not as good as randomization because you might not know all the variables to account for

What is randomization and how is it used in experiments?

- By definition, randomization is one method of control that helps to offset confounding effects by randomly assigning cases to the experimental and control group.
- The most important advantage is that this controls for numerous factors simultaneously even when the researcher is unaware of what they are. In other words, the researcher can equalize the two groups (experimental vs control) on all initial differences between them.

Matching refers to:

A. Linking subjects in the pretest group with those in the post test group
B. Selecting pairs of subjects who are included and not included in an experiment
C. Selecting similar pairs and assigning each member randomly to the experimental and control groups
D. Linking pairs on IV with those on DV
E. Assigning similar pairs to different settings for the same experiment

A Variety of Experimental Design

1. Classic Experiment

- Experimental Group:

  pretest ----> X ----> posttest

  Control Group:

  pretest ----------> posttest

- Strength: good at proving causality
- Weakness: lack of generalizeability to the real world

The classical experiment includes all of the following except:

A. Independent variables and dependent variables
B. Pretesting and posttesting
C. Laboratory and natural settings
D. Experimental and control groups

Which one of the following is not an aspect of the classical experiment?

A. Independent and dependent variables
B. Experimental and control groups
C. High internal validity and high external validity
D. Pretesting and posttesting
E. All of the above

2. Pre-Experiments = Quasi-Experiments

a. One-shot case study
(no pretest, no control, has everything else)

- Experimental Group: X ----> posttest

b. One-group pretest-posttest design
(no control, has everything else)

- Experimental Group:
  pretest ----> X ----> posttest

c. Static-group comparison
(no pretest, has everything else)

- Experimental Group: X ----> posttest
  Control Group: ----> posttest

3. Solomon Four-Group Design: Adds two more groups to an experiment so that the effect of pre-testing can be determined

- Group 1 (experimental):
  pretest ----> X ----> posttest
  Group 2 (control):
  pretest ----------> posttest
  Group 3 (experimental):
  ---------- X -----> posttest
  Group 4 (control):
  ----------> posttest

4. Natural experiments: studying phenomenon in its natural environment. Field research on a topic that a researcher cannot set up on their own, nor always seek out (e.g. Hurricane Katrina in terms of both the event and the aftermath)

5. Double-blind experiment: Both subjects and researcher unaware which subjects in the control group and which in the experimental group

What differentiates quasi-experimental designs from true experimental designs?

A. Smaller samples
B. Lack of random assignments of subjects to an experimental and a control group
C. Shorter time periods
D. Pretest and posttest
E. More rigorous definitions of the intervention

Which design addresses the problem of testing interaction with the stimulus?

A. Solomon four-group design
B. Double-blind design
C. One-shot case study
D. Static group comparison

Dr.Stets is doing a study where she introduces a stimulus -longer coffee breaks- and then measures how often employees left early (DV). No pretests are done. Which design?

A. Solomon four-group design
B. Double-blind design
C. One-shot case study
D. Static group comparison

The posttest-only control group most closely represents which preexperimental design?

A. One-shot case study
B. Solomon four-group design
C. One-group pretest-posttest design
D. Static group comparison design

Natural experiment refers as to experiments which:

A. Contain no artificial ingredients
B. Occur naturally in the laboratory
C. Encourage people to act naturally
D. Occur naturally without the experimenter's interaction

Which one of the following is false regarding the experimentation?

A. The experimental model is closely related to the traditional image of science
B. Experimentation is especially appropriate for hypothesis testing
C. It is better suited for explanatory than descriptive research
D. It is especially notable for high researcher control
E. All of the above

The importance of having a pretest to compare with posttest results lies in:

A. Making the sample more random
B. Comparing the results across pretests
C. Comparing pretest results with posttest results across groups in the experiment
D. Making the two groups more equal
E. Comparing the pretest with pretests in other experiments to gain generalizability

Dr.Stets performed an experiment in which neither the subjects nor the experimenter knew who got the stimulus. This is an example of:

A. One-shot case study
B. Classical design
C. Double-blind experiment
D. Static-group comparison
E. Pretest-posttest design

Validity Issues

- 1. External validity = experiment results may not be generalizeable to real world
- 2. Internal validity = experiment results may not be accurate because something else besides X affected your Y.

Internal Validity Summary

a. History = unplanned event during experiment (i.e. 9/11) change Y

ex: Hawthorne Effect (Introduced worker condition improvements, output up; Take away improvements, output still increases; Why? Experiment took place in Great Depression; workers simply tried to work harder to avoid getting fired)

b. Maturation = subjects change between T1 and T2 (especially kids)

c. Testing = taking same pre- & post-test may change responses

d. Instrumentation = diff. measures or administrators used for pre&posttest

e. Statistical Regression, or “regression from the mean” = subjects started high on a spectrum (i.e. test scores) and can only go down, or vise versa

f. Selection Biases = control and experimental groups not identical, spurious variable may be affecting Y

g. Experimental Mortality = certain subjects drop out midway, and may be a spurious variable that differentiates those who stay and those who go

h. Causal Time Order = confusion over whether X came before Y

- i. Diffusion = experimental group contacts control group and passes on part of the X stimulus
- j. Compensation = researcher feels bad that control group is denied valuable stimulus (i.e. drug treatment) and compensates by giving control group special treatment (i.e. extra kindness)
- k. Compensatory Rivalry = control group jealous of success of experimental group who gets positive X stimulus (i.e. math tutors) and so compensates by working extra hard to compete
- l. Demoralization = opposite of above; control group gets demoralized for not being able to compete with experimental group

Dr.Aguirre did an experiment on the effects of interpersonal attraction on conflict orientation, but he used different measures of conflict orientation at the pretest and posttest. Which problem of internal validity?

A. Selection bias
B. Testing
C. Experimental mortality
D. Maturation
E. Instrumentation

Gena, a subject of Dr.Burke's experiment testing the effects if certain experiences on a person's emotional state, has just undergone a break-up with her boyfriend. He continues with the experiment, however. This is related to which issue of internal validity?

A. History
B. Maturation
C. Selection bias
D. Selection maturation
E. Unforced errors