Experimentation

Todd Davies
Symsys 130
May 6, 2013

APA Format for Reporting Research

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Abstract
Introduction
Experiment 1
   Method
      Participants
      Materials/Apparatus
      Procedure
   Results
   Discussion

(Experiment 2
 Experiment 3
…)
General Discussion
References
Tables & Figures

Components of Method

1. Participants (a.k.a. "subjects", "respondents")
2. Materials/Apparatus
3. Procedure
   - a. Groups
      - Within-group(s)
      - Between groups
         - Random assignment
         - Blocks
            - Demographic
            - Pretested

b. Conditions
   - Treatments/Programs
   - Control(s)
   - Settings

c. Time Course – pre/post

d. Factor – a set of conditions representing different values/levels of a variable

e. Crosses – combinations of factors

f. Measures/observations

Types of Studies

(Randomized) Experiment – randomized assignment to conditions

Quasi-experiment – multiple groups or a pre-post time course

Observational study – neither a true nor quasi-experiment

Forms of Validity for a Study

Internal validity – extent to which the study can establish a relationship between independent and dependent variables

External validity – extent to which the study can be generalized beyond its setting(s) or population(s)

   Ecological validity

Consider…

A researcher studying the effects of media multitasking on cognitive and emotional skills

Confounds/Validity Threats

Within-group designs

- Covariates/confounding variables

- Order effects

- Mortality

- Regression

Between-group designs

- Selection biases

Confounds/Validity Threats - Approaches

Within-group designs

- Covariates/confounding variables – adjust/ control for covariates

- Order effects – counterbalancing

- Mortality – compare on pre-test measure(s)

- Regression – estimate regression effect (+?)

Between-group designs

- Selection biases – random assignment

Observer Effects

Pygmalion effect (Self-Fulfilling Prophecy)

   e.g. Rosenthal study

   Clever Hans phenomenon

Hawthorne effect

Demand characteristics

Social desirability effects

Observer Effects - Approaches

Pygmalion effect (Self-Fulfilling Prophecy)

e.g. Rosenthal study

Clever Hans phenomenon
– make experimenters blind to hypothesis

Hawthorne effect – unobtrusive procedures

Demand characteristics – make Ps blind to hypothesis (deception, bogus pipeline)

Social desirability effects – noisy sampling

Remember Classical Test Theory

Observed Score = True Value + Error

Observation =

Signal

+

Noise

Signal Enhancement: Factorial Designs

Each factor is a discrete (nominal or ordinal) variable, e.g. 2 factors of m levels and n levels ->

   an m x n design = mn conditions/cells

Null effects

Main effects

Interaction effects

(Randomized) Block Designs

k homogeneous groups

Blocking reduces noise by eliminating within-group variation on a measure

A few additional points...

Experiments do not always have a control condition

Experiments do not always have a hypothesis

A-B Testing

Cascade of science