Correlational Research

Outline

- Correlational research
  - Pearson’s r
  - Multivariate regression
- Surveys
  - Purpose
  - Planning
  - Pilot testing
  - Selecting a sample
- Reliability
- Validity
- APA Method
  - Participants
  - Design
  - Material
  - Procedure
  - Style

Correlational Research

- A type of research in which two, or more, variables are measured to determine if they are related
- Can you predict the value of one variable given the values of the other variable(s)?
- Cannot show causation
- Why?
Pearson’s $r$

- Pearson’s $r$ – bivariate correlation of variables on interval or ratio scale
  - Ranges from -1 to +1
    - Sign
    - Magnitude
  - Coefficient of determination = $r^2$
    - Proportion of variability in one variable that is explainable by variation in the other variable

Multivariate Regression

- Uses the values of several variables to explain variability in another variable
  - Sources of variation of GPA
  - $R^2$

Purpose of Surveys

- Surveys assess people’s
  - beliefs
  - attitudes
  - self-reported behaviors
  - Why self-reported?
- Surveys provide
  - descriptive data
  - relational data
Planning a Survey

- Determine purpose of survey FIRST
  - What is your hypothesis?
  - Why is it important?
  - What information do you need?

Planning a Survey

- Determine method of administration
  - Self-administered
    - Advantages
    - Disadvantages
  - Investigator administered
    - Advantages
    - Disadvantages
  - Interviews
    - Advantages
    - Disadvantages

Planning a Survey

- Determine the types of questions:
  - Closed
    - Fixed alternative (multiple choice)
      - Advantages
      - Disadvantages
    - Likert scales
      - At most 7 responses
      - Advantages
      - Disadvantages
  - Open-ended
    - Essay
      - Advantages
      - Disadvantages
Planning a Survey

- Write the items
  - Single issue per item
  - Write at 3rd grade level
  - Avoid personal questions unless necessary
  - Avoid questions with socially desirable answers
  - Avoid leading questions
  - Be concise
  - Avoid negations
  - Avoid ambiguous questions
  - Add demographic questions

Pilot Testing

- Before performing the survey, know how you are going to analyze the data
- Pilot test (pretest) the survey
  - Similar sample and administration
  - Get reactions to questions and questionnaire
  - Revise
- Reliability and validity

Sampling

- Why use a sample?
- Types of samples:
  - Probability sampling
    - random
    - stratified random
  - Nonprobability sampling
    - haphazard / convenience
    - quota
Random Sample

- Every member of the population has an equal and independent chance of being selected
  - Advantages
  - Disadvantages

Stratified Random Sample

- Population is organized into groups (strata)
- Sample is randomly selected from the strata in the same proportion as the strata is to the population
  - Example
  - Advantages
  - Disadvantages

Haphazard / Convenience Sample

- The sample consists of whomever is available at that moment in time
  - Examples
  - Advantages
  - Disadvantages
Quota Sample

- Stratified random sample: random sample :: quota sample: haphazard sample
- Quota sample attempts to match an attribute of the sample to the population
  - Example
  - Advantages
  - Disadvantages

Sample Size

- Sample size depends on
  - Sampling error
    - How close you want the sample mean to be to the population mean
  - Confidence level
    - If multiple samples were collected, the percentage of those samples whose sample statistic will be within the sampling error from the population mean
  - Population size

### Sample Sizes (Random Sample)

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Response Rate

- Response rates are frequently low
  - Magazines – 1 to 2%
  - Mail – 10 to 50%
  - Telephone – 80%
  - Face-to-face – 90%
- Plan so that the number of responses received equals the desired sample size
- Bias

Increasing Response Rate

- Give the questionnaire a personal touch
- Minimal amount of effort required
- Make topic interesting
- Make respondent identify with organization or researcher giving the questionnaire

Reliability

- Have multiple items per construct
- Measuring reliability
  - Test-retest
  - Split half / Cronbach’s α
  - Parallel forms
Validity

- Find a pre-existing way of measuring the same construct
- Correlate the new way of measuring with the pre-existing way of measuring

APA Method

- Tells the reader what was done in sufficient detail that the reader could replicate the study
- Typically broken into three or four subsections:
  - Participants
  - Design
  - Materials (sometimes called Apparatus)
  - Procedure

Participants

- Describe the people who participated and why they participated
  - Total number; number of males, females
  - Brief description (e.g. undergraduates at a Midwestern private university)
  - Descriptive stats for age (mean, sd)
  - Why they participated (e.g. class requirement; research credit; paid $5)
Design

- Used only if the number of variables is large
- IVs, levels, how they are manipulated
- DVs
- Control variables and their values

Materials / Apparatus

- Things used in the study
  - Include reliability and validity of questionnaires with appropriate citations
- Do not list common items – pencils, paper, tables, chairs, etc.
- Use sentences!

Procedure

- Step-by-step account of what happens in the study
Method Style

- Starts immediately after the introduction
- For us, with a single study:
  - Level 1 heading, Method
  - Level 2 headings, Participants, Design (if used), Material, Procedure