

Quantitative Analysis for Survey Data

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Introduction

- We have discussed survey design and writing survey questions.
- Now you have given the survey, what do you do with it?
- Quantitative analysis
 - Summary or descriptive statistics
 - Inferential statistics

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Steps in Analysis

- Proper data entry
- Types of variables
- Data cleaning
- Descriptive statistics
- Testing for relationships

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Data Entry

- Automated vs. manual entry
- Excel vs. SPSS
- Each column is a variable
- Each row is an entity
- Check all that apply: each answer is its own variable!
- Otherwise each question is a variable
- Enter the data raw: reverse code and calculate scales and scores in the computer

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Types of Variables

- Levels of measurement (Stephen's typology)
 - Nominal
 - Ordinal
 - Interval
 - Ratio
- Quantitative (Discrete and Continuous) vs. Qualitative
- Level of measurement important in type of statistic. But don't get hung up on Stephen's typology!
- Response variables vs. explanatory or predictor variables (independent vs. dependent variables)

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Data cleaning

- Important first step
- Check for out of range values
- Check for missing values
- Run “frequencies” on all the variables

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Descriptive Statistics

- Nominal variables
 - Report frequencies and percentages in each category
- Ordinal variables
 - Report frequencies and percentages in each category--maybe!
 - Report means and medians, mins and maxes.
- Quantitative variables: Interval and ratio level
 - Report means and standard deviations

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Descriptive Statistics

- **Tables**
 - Sometimes report frequencies and percentages in text when the number of categories is small
 - Sometimes report frequencies and percentages in a table when the number of categories is large
- **Lists**
 - Order a set of ranked variables by their average rank.
 - Bulleted lists are easy to read

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Descriptive Statistics: Graphs

- **Pie Charts:** Only appropriate for small numbers of mutually exclusive categories.
- **Bar Charts:** Very useful!
 - Can represent a single categorical variable or more than one categorical variable

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Good Graphs

- Avoid Chart Junk
- Avoid 3-D
- Do not condense or break the y-axis
- Simple is better
- Include legends only when necessary
- Be careful of the defaults in Excel
- Use a descriptive title
- Label axes!
- Cite data source

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Looking for Relationships

- Relationships between categorical variables
 - 2X2 table use Fisher's Exact test or χ^2 test with continuity correction
 - For larger tables use χ^2 test
- Relationships between ordinal variables
 - Kendall's Tau
 - Spearman's Rank Correlation Coefficient

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More Relationships

- Relationships between quantitative variables
 - Pearson's product-moment correlation coefficient = r
 - Spearman's rank correlation coefficient is better when you have violated normality! Look for outliers.

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Relationships Between Quantitative and Qualitative Variables

- 2-levels of qualitative variable
 - Independent t-test
- Are the observations independent or paired?
- 3 or more levels of qualitative variable
 - Analysis of Variance

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Associations with More Variables

- Multiple Regression
- General Linear Models
- Mixed Models
- Logistic Regression
- Generalized Linear Mixed Models
- ...

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Call Me! Make an Appointment

- X4861 (282-4861)
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- If you ever feel unsure of how to proceed, or just want to bounce your ideas about statistical analysis off someone please feel free to call me!
- I am here to help!

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