Statistics for Everyone Workshop, Fall 2010


Funded in part by the Core Integration Initiative and by the Center for Academic Excellence at Fairfield University

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OVERVIEW OF WORKSHOP

| Day 1: Parts 1 & 2. Summarizing and graphing data; descriptive statistics |
| Day 2: Part 3. T tests |
| Day 3: Parts 4a & 4b. One-way ANOVA; two-way ANOVA |
| Day 4: Part 5. Chi square |
| Day 5: Part 6a & 6b. Correlation & Regression; Part 7: Putting it all together (how to choose appropriate statistic) |

Part 1. Statistics as a Tool in Scientific Research: Summarizing and Graphically Representing Data

A. Statistics as a Tool in Scientific Research
   - Types of research questions (descriptive, correlational, experimental)
   - Types of data (categorical and numerical)
   - Types of statistical procedures (descriptive, inferential)

B. Basic Numerical Summaries in Tables
   - Frequency and relative frequency tables
   - Contingency tables

C. Choosing the Appropriate Type of Graph
   - Bar graphs
   - Histograms
   - Scatterplots
   - Time series plots

D. Shapes of Distributions and Outliers

E. Pitfalls to Avoid and Guidelines to Follow in Making Graphs

F. Hands-On Exercise: Making Graphs Using Excel and SPSS
Part 2. Descriptive Statistics: Measures of Central Tendency and Variability

A. Central Tendency (mean, median, mode)
B. Variability (range, SD, interquartile range, SE)
C. Hands-On Exercise: Obtaining Descriptive and Summary Statistics Using Excel and SPSS

Part 3. Comparing 2 Conditions With a T Test

A. Types of T Tests: One-sample t test, Independent samples t test, Paired samples t test
B. When to use, how to run, how to interpret and report
C. Hands-On Exercise: Running T Tests Using Excel and SPSS

Part 4a. Comparing 2 or More Conditions With a One-Way ANOVA

A. Types of One-Way ANOVA: Independent samples F test and repeated measures F test for main effect
B. When to use, how to run, how to interpret and report
C. Hands-On Exercise: Running One-Way ANOVA Using SPSS

Part 4b. Comparing 2 or More Independent Variables Using a Two-Way ANOVA

A. Types of Two-Way ANOVA: Independent samples, repeated measures, and mixed factorial; understanding main effects and interactions
B. When to use, how to run, how to interpret and report
C. Hands-On Exercise: Running Two-Way ANOVA Using SPSS

Part 5. Comparing the Proportion of Scores in Different Categories With a Chi Square Test

A. Types of Chi Square Tests:
   - One-way table (goodness of fit test)
   - Two-way table (test for independence)
B. When to use, how to run, how to interpret and report
C. Hands-On Exercise: Running Chi Square Tests Using Excel and SPSS
Part 6a. Assessing the Relationship Between 2 Variables With Correlation

A. Correlation and Regression

B. When to use, how to run, how to interpret and report

C. Hands-On Exercise: Running Correlations and Regression Using Excel and SPSS

Part 6b. Assessing the Relationship Between Multiple Variables

A. Correlation and Regression

B. When to use, how to run, how to interpret and report

C. Hands-On Exercise: Running Correlations and Regression Using Excel and SPSS

Part 7: Putting It All Together

A. Choosing the appropriate statistical test for your research question

B. Optional hands-on exercise: Develop a teaching module for one of your courses to integrate statistical reasoning (work on individually or in small group; present to larger group)