

SOCI-120--401 SOCIAL STATISTICS
University of Pennsylvania

Fall 2004
401 Lec Monday, Wednesday 4-5pm
402 Rec Friday 10-11am
403 Rec Friday 11-12noon
404 Rec Friday 12-1pm

Instructor: Matthew Holtman, Ph.D., mholtman@sas.upenn.edu
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Office hours: By appointment.
Web site: <https://courseweb.upenn.edu>

Required Texts

·David Freedman, Robert Pisani, Roger Purves. 1998. *Statistics (Third Edition)*. New York: W W Norton.

·Stephen A Sweet and Karen Grace-Martin. 2003. *Data Analysis with SPSS: A First Course in Applied Statistics (Second Edition)*. Boston: Allyn and Bacon.

Course Requirements

Exams	45%
Computer assignments	35%
Final project	20%

Overview

This course will give you a practical introduction to statistics for social science research. In the recitation sessions, you will use SPSS statistical software to work your way through a variety of problems selected to give you a strong foundation in the methods of statistical description and inference. By the end of the course you should be able to formulate, perform, and interpret appropriate statistical analyses to address common research problems in sociology. The lectures will be as light on theory as possible and will emphasize the practical aspects of using and interpreting numbers in social science and the media.

Class attendance is required and will be absolutely crucial to your ability to pass the course.

There will be 3 exams, 7 graded computer assignments, and a final project. For the regular computer assignments, you are encouraged to collaborate with your classmates. The exams and final project must be your work alone. For the final project, you will come up with a question you would like to answer using the data from the lab session (the data come from the General Social Survey, which comes with the SPSS book). You will formulate an analytical approach to your question, run the appropriate analyses, and interpret the results. You will write up a brief report to explain what you did and present your findings. Your final project will be graded on originality, accuracy, and clarity.

Approximate Schedule of Topics

Week	Topics	Reading
1-2	Introduction. Definitions. <ul style="list-style-type: none"> • Levels of measurement. • The experimental model. Data generation. Experiment vs. Observation. • Lurking variables and Simpson's paradox • Direct and indirect standardization 	FPP 1-2
3	Characterizing distributions. <ul style="list-style-type: none"> • Histograms. • Mean, median, mode, range, variance and standard deviation • Area under the normal curve 	FPP 3-5
4-6	Measurement error. Correlation. Spurious association and the logic of path diagrams. Bivariate regression.	FPP 6-10
7	Binary outcomes. Contingency tables. Chi-squared. Risk rates, conditional probability, relative risk, odds ratios.	FPP 13
8-9	Sampling and the central limit theorem. Sample error in survey research.	FPP 19-23
10-11	Accuracy of averages <ul style="list-style-type: none"> • SE vs. SD for inference • How SE changes as sample size increases • Statistical significance and confidence intervals. 	FPP 26
12-13	Statistical significance continued: more tests for averages <ul style="list-style-type: none"> • SE for a difference • Comparing 2 sample averages • Type I and Type II error. Statistical power. Magnitude vs. Effect size. 	FPP 27
14	Tests for contingency tables	FPP 28-29