

Syllabus
Sociology 541: Analysis of Sociological Data I
Spring 2008

Julie Phillips
Department of Sociology

Office: A356 Lucy Stone Hall / Room 203, IHHCPAR, 30 College Avenue

Email: jphillips@sociology.rutgers.edu

Phone: 445-7032 (Sociology office) / 932-1824 (IHHCPAR office)

Office Hours: Mondays after class or by appointment

Course URL: <https://sakai.rutgers.edu>

Course Description

This course is the first part of a two-semester sequence (541 and 542) designed to introduce you to methods of research and elementary statistics. Through this course, you will be introduced to a range of standard statistical techniques used in sociological analysis. Indeed, a considerable amount of sociological inquiry relies on such techniques; research using large surveys, public opinion polls, and census data document, describe, and explain a wide range of sociologically motivated research questions. Thus, this course provides a critical foundation for students in the social sciences.

The course will be taught under the assumption that registered students have little or no statistical background and has the following goals:

- Introduction to the basic concepts, terminology and procedures of data analysis, as well as the logic underlying those procedures
- Understand how to calculate basic descriptive and inferential statistics and interpret them
- Acquire statistical literacy and be able to determine when, why, and how various statistical tests are used
- Learn a statistical software package to perform analyses of quantitative data
- Foster the ability to think critically about scientific and media reports of research findings based on quantitative data

By the end of the semester, you should have a solid understanding of a variety of statistical concepts and techniques and be prepared to tackle multivariate regression, the starting point of the second course in the Sociology graduate statistics sequence.

Required Texts

Frankfort-Nachmias, Chava and Anna Leon-Guerrero. 2006. *Social Statistics for a Diverse Society*. Pine Forge Press.

Miller, Jane E. 2005. *The Chicago Guide to Writing about Multivariate Analysis*. University of Chicago Press.

Recommended Readings

Healey, Joseph F. 2005. *Statistics: A Tool for Social Research*. Seventh Edition. Thomson Wadsworth.

Sweet, Stephen A. and Karen Grace-Martin. 2007. *Data Analysis with SPSS*. Third Edition. Pearson Education.

I will be placing on the course website recent articles that have employed some of the statistical techniques you will be learning in this course. I strongly encourage you to read these articles to get a sense of how these techniques are applied in sociological research.

Other References

Agresti, A. and B. Finlay. *Statistical Methods for the Social Sciences*. Prentice Hall.
Devore, J. and R. Peck. *Statistics: The Exploration and Analysis of Data*.
Freedman, D., R. Pisani, and R. Purves. *Statistics*. (Less mathematical presentation)
Tanur, J. *Statistics: A Guide to the Unknown*. (Full of examples and a useful source for projects)
Wonnacott, T. and R. Wonnacott. *Introductory Statistics*. (More mathematical presentation)

Computing

There are a variety of powerful packages available to conduct statistical analyses; in my own work, I use SAS, STATA and SPSS (each one offers certain advantages!). In this class, we will use SPSS for Windows. SPSS manuals are available in the computer lab and can also be purchased directly from SPSS Inc. Additional support materials are also available on the CSRI web page, and the CD that accompanies your textbook contains a SPSS Appendix, with instructions on how to use the statistical package.

Course Website

Please make sure that you check the course website before you come to class each week. I will often make available handouts that we will discuss in class on the website. I will also post important class announcements here.

Course Requirements

Readings: Readings from the text will be assigned each week and it is expected that you will have completed the reading before the class. I recommend that you read the assigned material once before class and then again afterwards. It is also strongly encouraged that you complete the review exercises at the end of each chapter to ensure that you've understood the concepts. Learning statistics requires lots of practice.

Problem Sets/Computer Assignments: Weekly assignments will be handed out at the end of each class and are due at the beginning of the next class. These assignments account for 25% of your final grade.

Class presentations: Students are expected to participate fully in this class. We will typically begin each meeting by reviewing homework assignments and I will ask students to present solutions to assigned problems at that time. In addition, we will often break up into small groups to review certain statistical concepts, and I will ask a representative from the groups to present solutions and conclusions to the class. Your participation in these presentations constitutes 15% of your final grade.

Mid-Term Examination: There will be a midterm exam addressing concepts covered in the first half of the course. The exam constitutes 25% of your final grade.

Final Oral/Written Report: You will be required to acquire your own secondary data set and apply the techniques learned in this course to analyze the data. You have several options with regard to the data set you choose to use. I will make available two data sets that you can analyze. One contains information on the fifty states of the United States and the other is an extract of the General Social Survey. These data sets contain a series of variables and you can construct a smaller data set from this information, focusing on a topic that is of greatest interest to you. If you prefer, you may analyze another data set with which you are familiar, formulating a question of interest. I ask that you each turn in a one-page proposal of your topic (see last page of syllabus for details), due on March 3. The last class will be devoted to oral reports of these findings. Each class member will be allotted approximately ten minutes toward this end. A short paper (10 pages) detailing the analysis will also be required. This report and paper account for 35% of your grade.

Tentative Class Schedule

Week 1: January 28, 2008

Topic: Introduction to Statistics
Reading: FN and LG, Chapter 1 and Appendix F
Healey, Chapter 1

Week 2: February 4, 2008

Topic: Basic Concepts
Displaying and Describing Data
Computer Lab and Introduction to SPSS
Reading: FN and LG, Chapters 2 and 3
Miller, Chapter 2 (pp. 13-27)
Miller, Chapter 4 (pp. 50-62); Chapter 5 (pp. 81-94); Chapter 6 (pp. 120-127; Table 6.1)
Healey, Chapter 2

Week 3: February 11, 2008

Topic: Measures of Central Tendency
Measures of Dispersion
Reading: FN and LG, Chapters 4 and 5
Miller, Chapter 4 (pp. 62-67)
Miller, Chapter 13 (pp. 301-306)
Healey, Chapters 3 and 4

Week 4: February 18, 2008

Topic: Sampling, Probability and the Normal Distribution
Reading: FN and LG, Chapters 9 and 10
Healey, Chapters 5 and 6

Week 5: February 25, 2008

Topic: Basis of Statistical Inference (Point Estimates and Confidence Intervals)
Reading: FN and LG, Chapter 11
Healey, Chapter 7

Week 6: March 3, 2008

Topic: Hypothesis Testing and Significance Tests
Reading: FN and LG, Chapter 12 (pp. 403-417)
Healey, Chapter 8
Due: One-page summary of proposed paper topic

Week 7: March 10, 2008

Midterm exam (open-book)

MARCH 17, 2004 SPRING BREAK

Week 8: March 24, 2008

Topic: Comparing Two Groups (t tests)
Reading: FN and LG, Chapter 12 (pp. 417-432)
Miller, Chapter 10 (pp. 237-247)
Miller, Chapter 13 (pp. 306-311)
Healey, Chapter 9

Week 9: March 31, 2008

Topic: ANOVA
Reading: FN and LG, Chapter 14
Healey, Chapter 10

Week 10: April 7, 2008

Topic: Bivariate Regression and Correlation/Linear Association
Reading: FN and LG, Chapter 8
Miller, Chapter 3
Healey, Chapters 12 and 15

Week 11: April 14, 2008

Topic: Cross-Tabulations and Elaboration
The Chi-Square Test
Reading: FN and LG, Chapter 6 and Chapter 13
Miller, Chapter 5 (pp. 94-97), Chapter 6 (pp. 127-156)
Healey, Chapter 11 and 16

Week 12: April 21, 2008

Topic: Measures of Association for Nominal and Ordinal Variables
Guest lecture: Jane Miller
Reading: FN and LG, Chapter 7
Healey, Chapter 13 and 14

Week 13: April 28, 2008

In lieu of class, I will be available for individual appointments with those students wishing to discuss their final report.

Reading: Miller, Chapters 11-13

Week 14: May 5, 2008

Topic: Final Reports

Oral reports will be given in class. Written versions are due at the conclusion of class. No late papers will be accepted.

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Short Paper (due May 5, 2008)

One course requirement is to write a short paper (approximately 10 written pages, plus tables/graphs) on a topic of your choice. I recommend that you use one of the following SPSS data sets:

States.sav

GSS.sav

These data sets will be made available on the Sociology network. These data sources and the variables they contain are described in the Sweet book. I will be placing this information in the department lounge for your perusal.

If you have access to other data sets that are more relevant to your research interests, you should feel free to use them if you prefer. The primary goal of the paper is for you to learn the statistical methods, but there's no reason why the work can't be related to your primary areas of research. Feel free to come to me if you are interested in doing work of this kind but are having trouble locating an appropriate data set.

Due on March 3, 2008: A one-page summary of your paper topic.

Please be sure to consider the following points in the summary:

1. What relationship are you interested in?
Identify your outcome variable and the explanatory or independent variables.
2. What hypotheses can you draw about the relationship? Be sure to link these hypotheses to sociological theory. What guides your thinking and leads to these hypotheses?
3. How will you operationalize your hypotheses? What data set will you use? Which variables will you use from the data set to test your hypotheses?

I encourage you to come to me with any questions you may have about the paper early on in the semester so that we can make sure you're on the right track.