

Syllabus
Sociology 541: Analysis of Sociological Data I
Spring 2013, 1:10-3:50 in Seminar Room

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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; studies using large surveys, public opinion polls, and census data address 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 (FN & LG). 2011. *Social Statistics for a Diverse Society*. Pine Forge Press. 6th Ed.

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.

To obtain the open source data corresponding to the FN/LG textbook go to <http://www.sagepub.com/ssds6e/study/intro.htm>

The course website includes 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, such as SAS, STATA, and SAS. Each one offers certain advantages. In my own work, I mostly use SPSS, and I use SAS as needed. 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 (http://sociology.rutgers.edu/Sociologycomputing/CSRI_software.html) and the course website (a file entitled SPSS Appendix contains instructions on how to use the statistical package and is located in the folder named 'Frankfort_Nachmias CD' on sakai).

Course Website

Please make sure that you check your e-mail regularly for class announcements and updates on weekly readings and assignments. I will also post to the web-site handouts that we will discuss in class.

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 review the assigned material again after class to make sure you grasp it. Completing the review exercises at the end of each chapter will also help 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. We may also break up into small groups to review certain statistical concepts. I would ask a representative from the groups to present solutions and conclusions to the class. Your classroom participation 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 regards to selecting a data set. If you would like to use U.S. Census data or the General Social Survey (GSS), I can help you obtain extracts of data on-line. I can also help you acquire data from other sources such as ICPSR (log-in through RU library <http://www.icpsr.umich.edu.proxy.libraries.rutgers.edu/icpsrweb/ICPSR/index.jsp>).

The GSS and census data contain a series of variables and you can construct a smaller data set from this information. Regardless of which dataset you choose, focus on a topic or question that is of greatest interest to you. I ask that you each turn in a one-page proposal of your topic (see last page of syllabus for details), due on February 27. 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 term 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 23

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

Week 2: January 30

Topics: 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 6

Topic: Measures of Central Tendency and Variability

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 13

Topic: Sampling, Probability and the Normal Distribution

Reading: FN and LG, Chapters 6 and 7
Healey, Chapters 5 and 6

Week 5: February 20

Topic: Basis of Statistical Inference (Point Estimates and Confidence Intervals)

Reading: FN and LG, Chapter 8
Healey, Chapter 7

Week 6: February 27

Topic: Hypothesis Testing and Significance Tests

Reading: FN and LG, Chapter 9 (pp. 256- 270)
Healey, Chapter 8

Due: One-page summary of proposed paper topic. Review Sheet handed out

Week 7: March 6

Midterm exam

Week 8: March 13

Topic: Comparing Two Groups (t tests)
Reading: FN and LG, Chapter 9 (pp. 270-292)
Miller, Chapter 10 (pp. 237-247)
Miller, Chapter 13 (pp. 306-311)
Healey, Chapter 9

MARCH 15 SPRING BREAK

Week 9: March 27

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

Week 10: April 3

Topic: Bivariate Regression and Correlation/Linear Association
Reading: FN and LG, Chapter 13
Miller, Chapter 3

Healey, Chapters 12 and 15

Week 11: April 10

Topic: Cross-Tabulations and Elaboration

The Chi-Square Test

Reading: FN and LG, Chapter 10 and Chapter 11

Miller, Chapter 5 (pp. 94-97), Chapter 6 (pp. 127-156)

Healey, Chapter 11 and 16

Week 12: April 17

Topic: Presenting and talking about numbers

Reading: Teaching Statistics, "Organizing data in tables and charts"

Writing about Multivariate Analysis (WAMA).

Print out WEEK 12_EXERCISE and bring to class (located in the Lecture Notes folder on Sakai)

Review Miller, Chapter 3 and bring the book to class

Bring SPSS printout of bivariate statistics on your data and topic for the course paper: The pertinent type of statistical comparison and test (difference in means, correlation, or cross-tabulation, w/ associated inferential test) for the association between your dependent variable and key independent variable. You will be given time in this class to sketch out the pertinent table and chart for that comparison, and start to draft a written description of your own findings as a way to start on your course paper.

At your leisure (but before you take Soc. 542 !), read the following:

Measures of Association for Nominal and Ordinal Variables

FN and LG, Chapter 12

Healey, Chapter 13 and 14

Week 13: April 24

To be announced. Tentatively, I plan to use class time to hold individual meetings with students about their final reports.

Reading: Miller, Chapters 11-13

Week 14: May 1

Topic: **Final Reports**

Oral reports will be given in class. Written versions are due at the conclusion of class. Late papers will be accepted only under exceptional circumstances.

Short Paper (due May 1, 2013)

One course requirement is to write a short paper (approximately 10 written pages, plus tables/graphs) on a topic of your choice. The following SPSS data sets are well suited to the assignment.

GSS2008
mtf2008
hints2007.sav
States.sav
GSS.sav

The first two datasets are available with FN & LG. The second should be available via the Sociology network (W:\jp-soc541) and are described in the Sweet book.

You are also encouraged to familiarize yourself with a data set that is more relevant to your research interests (see <http://www.sagepub.com/protected/ssds6e/icfr/resources.htm>) and use it instead if it is readily available. 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 need help finding a data set that matches your interests.

Due on February 27, 2013: 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.