PS170A: Introductory Statistics for Political Science and Public Policy

Spring 2007
TuTh 12:30-1:50, SSB333
Computer lab: Solis 105
http://dss.ucsd.edu/~lazeng/ps170

Prerequisite: PS30

Prof. Langche Zeng
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Office Hours: TuTh 2:30-3:30, SSB 399

Course Description

This course introduces you to methods and tools for empirical data analysis in political and social science research. In particular, you will learn basic statistical techniques that are useful for the description of, and inference from, observed data for the purpose of testing theories and discovering empirical regularities. The course will also familiarize you with a statistical package for analyzing data.

Books, Software, and Internet Resources

The required text for the course is:

Statistical Methods for the Social Sciences. 3th edition. By Alan Agresti and Barbara Finlay. Prentice Hall, 1997. ISBN: 0135265266. Data from the book can be found here.

A recommended book with a similar coverage of statistical methods is:

Introduction to the Practice of Statistics. 5th edition. By David Moore and George McCabe. W.H.Freeman. 2005. Its companion website at http://bcs.whfreeman.com/ips5e/ has some useful features, such as statistical applets and lots of additional exercises.

We will use a statistical package called Stata , which is available in Solis 105 (where we will hold some of the class meetings) as well as many other computer labs on campus. You may consider purchasing your own copy at discount prices under GradPlan (an arrangement between UCSD and the Stata company.) There are many useful on-line resources that can help you learn and use Stata, an excellent one is here . You will also find the the UCLA Stata textbook examples website useful, which has worked-out examples from your textbook.

You are also strongly encouraged to learn R , a very powerful and freely available statistical computing environment. A user contributed package, Rcmdr , provides a graphical user interface that makes R easy to use for beginners, and covers the content of a basic statistics course like this one. There are extensive on-line

resources for learning and using R, for example SimpleR (a book version is also available: *Using R for Introductory Statistics* by John Verzani. Chapman & Hall 2004).

At various points in the course, you may find some on-line teaching aids, such as some of these Java applets, helpful for understanding key statistical ideas. You may also find materials at DASL (an on-line library of data files and stories illustrating the application of basic statistical tools) and Chance (a website with a collection of news articles that use probability or statistical concepts) interesting/useful.

For comprehensive data resources, check out Statistical Resources on the Web: Political Science .

Course Requirements

Evaluation of course work will be based on homework assignments, attendance/in class participation, a midterm, and a group research project or a final exam. The distribution of weights are approximately:

35% Research project or Final exam
30% Homework
25% Midterm
10% Attendance and in-class participation

The exams may be either open book or closed book, or a mixture of both, and stress understanding and interpretation. The final exam will be comprehensive, though may emphasize the materials from the second half of the course. The group project should apply some statistical methods to the study of some substantive issue that interests you. Each group consists of 2 or 3 students. You should start forming the groups immediately. The project should be finished, in the form of a final research paper of 10-15 pages, by the last class meeting (6/7), when you will submit the paper and present your work to the class.

If you opt for the final exam, you must notify me as soon as possible and no later than 5/31.

Administrative Policies

Extensions on homework assignments or research papers, and make-up or early exams will only be granted in cases of documented illness and other emergency situations beyond your control. Please contact me immediately if you find yourself in such a situation. Any request for grade changes must be made formally in writing. Review of a grade may result in changes in either direction.

Course Plan

The research project: You should find your coauthors and locate your data sets as soon as possible. You may find the data sources linked from the syllabus useful, and of course you can use any other good sources available. Try to use datasets that have at least 50-100 observations. The more the better in principle, and a few hundred or few thousand or even tens of thousands should be very comfortable size for average computers of today. By the end of the 5th week (5/3), I expect a 1-2 page research proposal outlining the motivation of your project, the methods you plan to use, the status of data work, and expected contributions. Two weeks before the final class meeting, I expect a 2 page summary of your initial findings. We will discuss the projects formally or informally along the way for the purposes of sharing and feedbacks. The final paper is due by the last class meeting (6/7) and you will present your work to the class at that meeting.

Supplementary papers for class use: You are welcome to suggest papers/articles of special interest to use in class (for example you might come across some papers particularly relevant to your research, but you have difficulty understanding the methods part; or you may see some papers that illustrates the application of some methods we cover in class particularly well and you want to share with your classmates.) To suggest a paper, either give me a hard copy or send me a pdf file. We will use if possible. You may be asked to lead the discussion on the paper.

Topics: The following is an initial plan for the course content with readings from the textbook indicated. Some adjustment in pace or coverage may become necessary. Any updates to the syllabus will be communicated in class, or sent to class email list, or posted on-line at http://dss.ucsd.edu/~lazeng/ps170.

1. Tu. 4/3. Introduction to the Course. Student survey.

2. Th. 4/5. The empirical research process. Introduction to statistical methods. Measurement and types of variables.
Readings: Agresti and Finlay, Chapter 1, Chapter 2.1.

3. Tu. 4/10. Introduction to Stata (meet in Solis 105)
Readings: Stata starter kit

4. Th. 4/12. Samples and populations; Sampling; Sampling variations.
Readings: Agresti and Finlay, Chapter 2.2-2.4.

5. Tu. 4/17. Descriptive statistics. Graphical presentations
Readings: Agresti and Finlay, Chapter 3

6. Th. 4/19. Descriptive statistics. Graphical presentations (continued).
Readings: Agresti and Finlay, Chapter 3

7. Tu. 4/24. Introduction to probability theory. Distributions and sampling distributions.
Readings: Agresti and Finlay, Chapter 4

8. Th. 4/26. Introduction to probability theory. Distributions and sampling distributions (continued)
Readings: Agresti and Finlay, Chapter 4

9. Tu. 5/1. Statistical inference: Estimation
Readings: Agresti and Finlay, Chapter 5

10. Th. 5/3. Statistical inference: Estimation (continued)
Readings: Agresti and Finlay, Chapter 5

11. Tu. 5/8. *Mid-term Exam*

12. Th. 5/10. Statistical Inference: Hypothesis testing
Readings: Agresti and Finlay, Chapter 6

13. Tu. 5/15. Statistical Inference: Hypothesis testing (continued)
Readings: Agresti and Finlay, Chapter 7

14. Th. 5/17. Correlation and simple regression
Readings: Agresti and Finlay, Chapter 9

15. Tu. 5/22. Multivariate relationships
Readings: Agresti and Finlay, Chapter 10

16. Th. 5/24. Multiple regression
Readings: Agresti and Finlay, Chapter 11

17. Tu. 5/29. Categorical responses and logistic regression
Readings: Agresti and Finlay, Chapter 15

18. Th. 5/31. Categorical responses and logistic regression (continued)
Readings: Agresti and Finlay, Chapter 15

19. Tu. 6/5. Relationships between categorical variables. Contingency table analysis.
Readings: Agresti and Finlay, Chapter 8

20. Th. 6/7. Research presentations

21. Th. 6/14. *Final Exam.* 11:30-2:30.

Communication

I have a severe hearing loss that is not effectively helped by hearing aids, and I rely on speech reading and email for communication. This will certainly cause some inconveniences to you (e.g., I may ask you to repeat what you say, sometimes more than once; I cannot follow group discussions; In general I do not use the phone; etc.) I appreciate your understanding. Please do *not* refrain from asking questions, however. Besides clarifying issues at hand, questions help enliven the classroom, and chances are very high that any question you ask will also benefit many or all of your classmates. I also appreciate your feedback on teaching at any time. I will be compiling a class email list. Please make sure to send me your email address if it differs from the official UCSD address in the class roster.