

## Political Science 585: Introduction to Statistics and Research Design for the Social Sciences

**Meeting:** MWF 12:30 p.m. – 1:48 p.m.

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**Office Hours:** Mondays and Wednesdays, 10 a.m. to 12 p.m. or by appointment

Why should someone care about understanding statistics and being able to both critique and design research? Moreover, to what end is a statistics course in political science? Isn't politics just that—maneuvering in the political sphere, the interactions between countries, or how a bill becomes a law?

The truth might surprise you: nearly every government policy decision relies on good research and strong statistical analysis. The cars we drive must live up to emission standards that are set, for the most part, by quantitative analyses of air quality and the amount of carbon dioxide and monoxide produced by our automobile engines. Presidential elections can be won and lost by a candidate's performance in the polls, a system that relies heavily on sampling theory. And whether or not a new drug is approved by the FDA relies on strong experimental evidence and statistical analysis to determine whether it is safe for public consumption.

The goal of this course is to provide students with an elementary understanding of statistics, to indicate how this knowledge can help us to better understand social phenomena, and to give students the tools needed to design their own research. Further, we hope, by the end of the course, to all have at our fingertips a set of tools that will allow each of us to more critically assess the numbers we see flashing before us everyday.

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### Procedures and Requirements:

- **Readings:** Four books are required and should be available at the University bookstore, SBX, or Long's. Additional copies can be purchased online at [www.amazon.com](http://www.amazon.com), [www.bn.com](http://www.bn.com), or [www.abebooks.com](http://www.abebooks.com).
  1. Shively, W. Phillips. 1998. *The Craft of Political Research*, 4<sup>th</sup> Ed. New York: Prentice Hall.
  2. Levin, Jack and James Alan Fox. 1999. *Elementary Statistics in Social Research*. Boston: Allyn and Bacon.
  3. Gonick, Larry and Woollcott Smith. 1993. *The Cartoon Guide to Statistics*. New York: Harper Collins.
  4. Huff, Darrel. 1993. *How to Lie with Statistics*.

RR denotes additional readings that will be available for photocopying in the Political Science Reading Room. I've done this to save you money on a course pack. You can either choose to read and take notes on the articles/chapters while sitting in the reading room, or you may check out a copy of the article/chapter for 30 minutes to make photocopies. Some of these readings are more contemporary and practical applications of the abstract concepts we're discussing in class, and they should be pretty fun. Plus, the quizzes may focus on these readings—taking a look at them will pay off.

- **Class Meetings:** Because we are doing math, the course will be a lecture-oriented discussion. You are expected to keep up with the readings and to speak up when something is not clear (for the love of all that's holy and good, speak up!). And you should always expect to attend class—this stuff is cumulative, so if you miss one day, you might be in a mess of trouble. **Random class quizzes are assigned to provide additional incentive for attendance.**
- **Written Assignments:** Each week, you are expected to turn in assigned problem sets and other homework assignments. **Assignments are due at 12:30 p.m. on Mondays, unless otherwise specified.** All statistics assignments will be such that a calculator, a pencil, and notebook paper will be sufficient. You should show all your work to assure that you get partial credit.

Early in the course, I will ask you for two more protracted written assignments. These will involve 1) critiquing a newspaper or magazine article and 2) designing research to investigate a salient (!) social phenomenon. It is expected that these assignments will be typed, carefully proofread, and edited.

- **Grades will be distributed as follows:**

10%	In-class attendance quizzes
30%	Homework assignments
30%	Research design examination
30%	Statistics examination

Late assignments will be penalized one letter grade per day late. Make-up assignments, quizzes, and exams are only permitted under extraordinary circumstances (death in the family, documented illness, etc.). Believe me, I've probably used every excuse for missing classes in college, so pulling the wool over my eyes is not easy.

- **Academic Misconduct**

The University's Code of Student Conduct defines academic misconduct as "any activity which tends to compromise the integrity of the institution, or subvert the educational process." In a classroom setting, academic misconduct typically refers to

cheating on examinations or plagiarism in written assignments such as final papers. Cheating and plagiarism are not only dishonest, but they are very unfair to students who do their best to succeed honestly. Consequently, I take such problems very seriously, and I will seek to punish willful acts of cheating or plagiarism. The Code of Conduct provides for punishment ranging from failing the course to expulsion, depending upon the nature of the misconduct.

- **Students with Disabilities**

If you have any condition, such as a physical, psychiatric, medical, or learning disability, which will make it difficult for you to carry out the work required in this class, please notify me and the Office for Disability Services before the end of the first full week of class. Course materials are available in alternative formats upon request, and extra time may be allowed for exams in some cases. All information about your disability will remain confidential.

## Schedule

**September 20:** Introduction and NES sample survey handout

**September 22:** Why should we do social science research?

1. Salkind, Chapter 1 (RR)
2. Shively, Chapter 1
3. Hoover and Donovan, Chapter 1 (RR)
4. “The Numbers Game.” *Newsweek*, July 25, 1994 (RR)

**September 25<sup>th</sup> and 27<sup>th</sup>:** The Scientific Method, Causation, and Generalization

1. Shively, Chapter 2
2. Hoover and Donovan, Chapter 2 (RR)
3. “So-called Mozart effect may be (yawn) just a dream.” *Boston Globe*, Feb. 12, 2000. (RR)
4. “Latte Lightweights: When a powerful country starts drinking good Java, down goes the empire.” *Time*, December 6, 1999. (RR)
5. “Researchers fail to find any genetic link to male homosexuality.” *New York Times*, April 23, 1999. (RR)

*Due: NES sample survey and information cards due at the beginning of class on Monday the 25<sup>th</sup>.*

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*Assignment due Monday, October 2<sup>nd</sup>:*

Find an article similar to the ones above. This can include psychology, political science, sociology, biology, chemistry, etc. articles. You can get these articles from a newspaper, popular magazine, or (if you'd prefer) you may turn to a scientific journal like *Nature* or *Science*. For your papers, you must do four things **inside of two single-spaced pages**:

1. Briefly state the article's central research question—what are the authors of the study attempting to answer with their research, and why it is important?
  2. Describe the procedures they employed to analyze this question.
  3. What did they find?
  4. Discuss dissenting views about the conclusions. Did other scientists remain skeptical of their work? Why?
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**September 29<sup>th</sup> & October 2<sup>nd</sup>:** Measurement, Variables, Reliability, and Validity

1. Shively, Chapters 3-5
2. Salkind, Chapters 2 and 5 (RR)
3. Levin and Fox, Chapter 1
4. “Telling Polls Apart.” *Washington Post*, August 16, 2000. (RR)

5. "I've Got to Admit It's Getting Better: And here's a way to measure it."  
From [www.slate.com](http://www.slate.com), February 9, 2000. (RR)

*Due: Article discussion paper, 12:30 p.m. on Monday, October 2<sup>nd</sup>*

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*Assignment due Monday October 9<sup>th</sup> (a preview for your first exam):*

A common question on University of Chicago graduate economic exams is: Why have shopping carts gotten bigger? Over the past 40 years, shopping carts have grown in size with no ready explanation. For this assignment, you need to take up to three single-spaced pages and do each of the following:

1. Introduce the research question—try to sell me on why this is important. You need not cite research on the subject. Just tell me what's compelling about understanding this question.
  2. Provide some sort of overarching theory as to why shopping carts are bigger. Make sure this is something you can test. For example, you might argue that because kids more often shop with their parents, carts need to be bigger to hold both the groceries and the children.
  3. Employ your theory to generate testable hypotheses. Using the above example, you might argue that as the time children have spent grocery shopping with parents has increased, the size of shopping carts has increased to match the demand for added space.
  4. Offer at least one alternate theory and hypothesis—what else, besides your hypothesis, might explain the increased shopping cart size?
  5. Tell me what your dependent variable and independent variable(s) are. Further, tell me how you might *measure* the dependent and independent variable(s).
  6. Finally, discuss issues of validity (internal and external) and reliability. What might you do to try to insure that your measures (from step 5) are valid and reliable? You should offer brief definitions of both reliability and validity in the discussion.
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#### **October 4<sup>th</sup>:** Experimental Design

1. Shively, Chapter 6 (pp. 71-84)
2. Nachmias and Nachmias, Chapter 5 (RR)
3. Gonick and Smith, Chapter 10
4. "4<sup>th</sup> Grader Challenges Alternative Therapy." *New York Times*, April 14, 1999. (RR)
5. Ansolabehere, Stephen and Shanto Iyengar. 1995. Chapter 2 from *Going Negative*. New York: Free Press. (RR)

**October 6<sup>th</sup>:** Surveys

1. Salkind, pages 195-199.
2. Girden, Chapter 4 (RR)
3. “Money Talks.” *The Nation*, August 21/28, 2000  
(<http://www.thenation.com/issue/000821/0821lakeborosage.shtml>)  
(RR)
4. And the actual survey instrument for the above story:  
<http://www.thenation.com/e2k/recent/poll.pdf> (RR)

**October 9<sup>th</sup>:** Other Methods: Case Studies, Interviews, and Focus Groups

1. Girden, Chapter 2
2. Fenno, Richard F. 1978. Appendix to *Home Style* (“Notes on Method: Participant Observation.”) Boston: Little, Brown. (RR)
3. Hibbing, John R. and Elizabeth Theiss-Morse. 1993. Selections from *Congress as Public Enemy*. Boston: Cambridge University Press. (RR)

*Due:* “Why are shopping carts so big?” Assignment, 12:30 p.m. on Monday the 9<sup>th</sup>.

**October 11<sup>th</sup>:** Continue “Other Methods” & Begin Statistics—Basic Math and Data Display

1. Levin and Fox, Chapter 2
2. Gonick and Smith, pp. 1-13

**October 13<sup>th</sup>:** Basic Math and Display (cont.); Review for First Midterm

\*\* If there is sufficient demand, I will arrange a review session for either Saturday or Sunday afternoon prior to the exam on Monday.

**October 16<sup>th</sup>:** First Midterm Exam Covering Research Design Concepts and Issues

\*\*Exams will be returned on Monday, October 23<sup>rd</sup>.

*Assignment: Basic Math and Data Display, Due October 23<sup>rd</sup> (to be given in class).*

**October 18<sup>th</sup>:** Data Description: Mean, Weighted Mean, Median, and Mode (Pt. I)

1. Levin and Fox, Chapter 3
2. Gonick and Smith, pp. 14-18

**October 20<sup>th</sup>:** Measures of Variability (Pt. I); Return and Review First Midterm

1. Levin and Fox, Chapter 3 (review)
2. Levin and Fox, Chapter 4
3. Gonick and Smith, pp. 19-26

**October 23<sup>rd</sup>:** Measures of Variability (Pt. II)

1. Levin and Fox, Chapter 4 (review)
2. Gonick and Smith, pp. 19-26 (review)

*Due: Basic Math and Data Display Assignment, 12:30 p.m. Monday the 23<sup>rd</sup>.*

*Assignment: Data Description: Mean, Median, Mode, and Variability (Due Monday October 30<sup>th</sup>).*

**October 25<sup>th</sup>:** Introduction to Probability

1. Gonick and Smith, Chapter 3
2. Levin and Fox, Chapter 5, pp. 125-133
3. “Does Crime Pay?” from [www.slate.com](http://www.slate.com). December 8, 1999. (RR)

**October 27<sup>th</sup>:** No Class

**October 30<sup>th</sup>:** Probability (continued)

1. Gonick and Smith, pp. 36-51; Chapter 4
2. “Rethinking thinking.” *The Economist*. December 18, 1999. (RR)

*Due: Data Description Assignment, at 12:30 p.m.*

*Assignment: Basic Probability, due Monday, November 6<sup>th</sup> at 12:30 p.m.*

**November 1<sup>st</sup>:** Z-Scores and the Normal Distribution

1. Levin and Fox, Chapter 5, pp. 134-157
2. Gonick and Smith, Chapter 5

**November 3<sup>rd</sup>:** Samples and Populations

1. Levin and Fox, Chapter 6, 158-172
2. Gonick and Smith, Chapter 6
3. Anderson, Margo and Stephen E. Fienberg. 1999. "To Sample or Not to Sample? The 2000 Census Controversy." *Journal of Interdisciplinary History* 30:1, 1-36. (RR)
4. "Politics and the Census." *Newsweek*. February 8, 1999. (RR)

**November 6<sup>th</sup>:** Confidence Intervals

1. Levin and Fox, Chapter 6, 173-194
2. Gonick and Smith, Chapter 7
3. "Pollsters Fret over Internet Surveys, Public Nonresponse." *San Diego Union-Tribune*, May 20, 1999. (RR)

*Due: Basic Probability Assignment on Monday, November 6<sup>th</sup> at 12:30 p.m.*

*Assignment: Z-Scores, Samples, Sampling, and Populations due November 13<sup>th</sup>.*

**November 8<sup>th</sup>:** Hypothesis Testing (Part I)

1. Gonick and Smith, Chapter 8

**November 10<sup>th</sup>:** Hypothesis Testing (Part II)

1. Gonick and Smith, Chapter 8 (Continued)
2. Bohrenstedt and Knoke, Chapter 3, pp. 97-101 (RR)
3. Levin and Fox, Chapter 7, pp. 197-213

**November 13<sup>th</sup> and 15<sup>th</sup>:** Testing Differences between Means

1. Levin and Fox, Chapter 7
2. Gonick and Smith, Chapter 9

**November 17<sup>th</sup>:** Analysis of Variance (ANOVA)

1. Levin and Fox, Chapter 8 (review)

**November 20<sup>th</sup>:** Catch-up and Review for Second Midterm Exam

\*\* If there is sufficient demand, I will schedule a review for Tuesday, November 21<sup>st</sup>.

**November 22<sup>nd</sup>:** Second Midterm Exam

\*\* This exam will cover material through differences in means (November 15<sup>th</sup>).

\*\* *Your exams will be returned on Wednesday, November 29<sup>th</sup>.*

*Assignment: ANOVA and Correlation, Due Wednesday, December 6<sup>th</sup> by 5 p.m.*

**November 24<sup>th</sup>:** Give thanks that your second midterm is over (among other things)

**November 27<sup>th</sup>:** ANOVA and Correlation

1. Levin and Fox, Chapters 8 (review) and 10
2. Huff, Chapters 1-3

**November 29<sup>th</sup>:** Correlation and Review Second Midterm Exam

1. Levin and Fox, Chapter 10
2. Huff, Chapters 4-8

**December 1<sup>st</sup>:** Where have we been, where are we going?

1. Huff, Chapters 9-10

**December 4<sup>th</sup>:** **Please don't show up for a final exam—there isn't one!**

**December 6<sup>th</sup>:** Final ANOVA and Correlation Assignment due by 5 p.m. to 2112 Derby Hall. I will be in my office all day Tuesday (the 5<sup>th</sup>) and Wednesday (the 6<sup>th</sup>) to answer final questions about the course, assignments, grades, etc.