

**University of Notre Dame**  
**Political Science 40810**  
**Quantitative Political Analysis**  
**Fall 2009**

DeBartolo 228  
MW 1:30-2:45  
Office hours: T 2:00-3:30  
& F 3:30-5:00

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In this course you will acquire the skills necessary to use the most common statistical techniques in political science and learn to interpret their results. Mastery of these techniques is essential for understanding research on public opinion and voting behavior, electoral studies, comparative and international political economy, the causes of war, regime change, legislative success, and many other topics. In this class you will read examples of quantitative research on democracy, public opinion, and elections. But more than that, you will actually participate in research by replicating what others have done and by doing original analyses yourself. Therefore, in addition to getting acquainted with some sophisticated research on interesting political topics, you will acquire many of the skills you need to carry out quantitative research on your own. These skills include writing advanced spreadsheet programs; finding and downloading datasets; doing the most common sorts of analyses in a statistical package; writing short reports on your findings; and reporting your findings orally and graphically.

There are eleven ungraded exercises and eight graded assignments, with the following weights and due dates:

10%	Sept. 9	Coding 15 countries on 4 variables
5%	Sept. 21	Histograms, means, medians, & standard deviations
5%	Sept. 23	Problem set on sample sizes, standard error, and confidence intervals
5%	Sept. 28	T-test on economic performance by party
15%	Sept. 30	Descriptive survey report
15%	Nov. 9	Cross-tabs report
15%	Nov. 30	Regression with interactions report
10%	Dec. 9	Logistic regression report

There will be a take-home final exam that will count as 20% of the grade.

Assignments must be turned in *before* the class in which they are due. I prefer electronic submission to dropboxes in the CourseWare folder for this class, accessible through WebFile. I reserve the right to lower your final grade by a sign if you rarely participate in class, have more than two unexcused absences, or if your assignments are often late. Work that goes significantly beyond what was required may receive extra credit. All graded work must be your own, but I encourage you to seek help from Brett, me, or your classmates on any ungraded assignments.

Two textbooks are available for purchase at the bookstore in the POLS section:

- Janet Buttolph Johnson and H.T. Reynolds, *Political Science Research Methods*, 6th edition (Congressional Quarterly Press, 2008) ISBN 9780872894426
- W. Phillips Shively, *The Craft of Political Research*, 6th ed. (Prentice-Hall, 2005). ISBN 0131174401

**IMPORTANT:** Articles in *journals* are available through the library's e-journal tab; chapters in *books* (other than the two textbooks) are available in e-reserves. Any exceptions are explained below. "Recommended" readings are not required, and therefore are not usually on reserve.

I will distribute free copies of SPSS software for you to use. You can install this on only one machine. I have not assigned reading on learning to use SPSS, as I will walk you through everything in class and it is practically self-explanatory and has excellent help files. However, you may sometimes want to consult a good web reference work on SPSS. (One source is listed for the Sept. 14 class.) The library also has copies of several handbooks on SPSS. Look for those by George and Mallery.

My website will have a page of links to many of the on-line datasets we will be using. My homepage address is <http://www.nd.edu/~mcoppedg/crd>.

### Schedule of Readings and Assignments

#### Aug. 26: The Role of Quantitative Testing in Political Science

In what ways is political science scientific? How is explanation different from description? What kind of theory is a realistic goal for political science? Are experiments necessary? How can we learn from observational data? Why does quantitative analysis lend itself to extensive, rather intensive, testing?

No required reading.

Recommended: Janet Buttolph Johnson and H.T. Reynolds, *Political Science Research Methods*, 6th edition (Congressional Quarterly Press, 2008), chapters 1 and 2.

Ungraded assignment for Aug. 31: Write a definition of any fairly abstract concept used in political science, such as "partisanship," "violence," "dictatorship," "ethnicity," or "prosperity." Type it and print it to hand in. I will choose a few to use for brainstorming in class about measurement strategies.

#### August 31: Measurement Principles

How is it possible to measure the intangibles of politics? Conceptualization, quantitative vs. qualitative measurement, precision, levels of

measurement, validity, reliability, scale and index construction.

- Janet Buttolph Johnson and H.T. Reynolds, *Political Science Research Methods*, 6th edition (Congressional Quarterly Press, 2008), chapters 3 and 4. This book is abbreviated as PSRM below.
- W. Phillips Shively, *The Craft of Political Research*, 6th ed. (Prentice-Hall, 2004), chapter 3.

Recommended: Gary Goertz, *Social Science Concepts: A User's Guide* (Princeton UP, 2006), chapter 2, "Structuring and Theorizing Concepts" (pp. 27-67); David Collier and Steven Levitsky, "Democracy with Adjectives: Conceptual Innovation in Comparative Research," *World Politics* 49:3 (1997): 430-451.

#### Sept. 2: Workshop on Measuring Democracy

You will get acquainted with some basic techniques for measuring political phenomena, using democracy as an example.

- PSRM chapter 6
- Shively chapters 4-5.
- Robert A. Dahl, *Polyarchy* (Yale UP, 1971), pp. 1-9.

Ungraded exercise for Sept. 7: Code the four

polyarchy scale variables for five countries using information from 2008. Guidance to sources will be provided in class.

### **Sept. 7: Using a Spreadsheet to Rate Countries**

No additional reading. Bring in your preliminary coding of 5 countries. We will compare your ratings with others' and discuss and resolve coding discrepancies, and if necessary, revise coding criteria. I will show you how to enter your data into an Excel spreadsheet and how to document coding decisions.

Graded Assignment for Sept. 9 (10%): By 9:00 am on Sept. 9, submit spreadsheet with coding of an additional 15 countries (to be assigned), for a total of 20.

### **Sept. 9: Dimensions of Democracy**

We will cover aggregation, validation, and reliability checks. You will learn to use functions in Excel, such as creating a sum and sorting by it. This skill will then enable you to try to scale your ratings. We will also find the median ratings for the whole class. How many dimensions are there?

No required reading other than the State Department human rights reports.

Recommended: Michael Coppedge and Wolfgang Reinicke, "Measuring Polyarchy," *Studies in Comparative International Development* 25:1 (Spring 1990): 51-72 .

### **Sept. 14: Mining the Internet for Political Data**

You will learn to convert Excel and other data to SPSS with the SPSS Data Wizard and generate descriptive statistics and graphs in SPSS. I will show you how to access other datasets from the Internet, how to use codebooks, and how to recode and transform data.

- If you are new to SPSS, I recommend spending some time with tutorials on SPSS produced by UCLA's Academic Technology Services. For today's topic, I particularly recommend the "class notes" on data management. There are both written and narrated videos of step-by-step instructions at [http://www.ats.ucla.edu/stat/spss/topics/data\\_management.htm](http://www.ats.ucla.edu/stat/spss/topics/data_management.htm).

Ungraded exercise for Sept. 16: Before class, spend about 45 minutes following the links to data archives found at:

My course webpage:

<http://www.nd.edu/~mcoppedg/QPA/links.html>,

The CESSDA Data Archives:

<http://www.CESSDA.org/accessing/catalogue/>,

and the IQSS Dataverse Network:

<http://dvn.iq.harvard.edu/dvn/>, where you

should look particularly at the ICPSR and Odum dataverses. Try to download a dataset yourself. This will probably be a bit frustrating, but that's good: you will come to class with questions.

### **Sept. 16: Measures of Central Tendency and Dispersion**

You will learn to calculate the mean, mode, median, and standard deviation in Excel, and to generate and interpret histograms. In class we will use a spreadsheet to calculate the mean and standard deviation for each component of the democracy ratings for each country; the mean and standard deviation of the summary democracy ratings for each country in 1985, 2000, and 2004; and produce histograms of the summary ratings for these three years.

- PSRM chapter 11 (351-393 only).

Graded Assignment for Sept. 21 (5%): In SPSS, open the StateData file from the course website. (You'll have to save it, unzip it, and tell SPSS to look for files of type \*.por.) Do a

“before and after” comparison of the distribution of states on one variable in two years by producing and interpreting histograms, means, medians, and standard deviations. What kind of process could have produced any changes you observe? Paste the histograms and statistics into a Word document and write your interpretation there.

### Sept 21: Distributions, Samples, the Standard Error, and Confidence Intervals

Sampling is the nearest thing we have to magic. It gives us the ability to make valid inferences about a whole population by examining only a small part of it. This session will give you a quick introduction to some aspects of probability theory, with an emphasis on the highly useful concepts of the normal distribution, standard error, and confidence intervals. You will learn how to take a random sample and how to calculate the impact of sample size on inferences about a population.

- PSRM chapters 7 (all) and 11 (pp. 416-420 only)

In class we will play with the RVLS Sampling Distribution Simulation at [www.ruf.rice.edu/~lane/stat\\_sim/sampling\\_dist/index.html](http://www.ruf.rice.edu/~lane/stat_sim/sampling_dist/index.html), the Normal Tool Game at the Utah Virtual Lab:

[www.psych.utah.edu/stat/bots/game7/Game7.html](http://www.psych.utah.edu/stat/bots/game7/Game7.html),

and the RVLS simulation of confidence intervals:

[www.ruf.rice.edu/~lane/stat\\_sim/conf\\_interval/index.html](http://www.ruf.rice.edu/~lane/stat_sim/conf_interval/index.html). Explore these on your own, too.

Recommended: Edward Tufte, *Data Analysis for Politics and Policy* (Prentice-Hall, 1974), pp. 40-46 on "Election-Night Forecasting"; Dalton Conley, "The Deciding Vote," *New York Times* (November 6, 2006); Jonathan N. Wand, Kenneth W. Shotts, Jasjeet S. Sekhon, Walter R. Mebane Jr., Michael C. Herron, Henry E. Brady, "The Butterfly Did It: the Aberrant

Vote for Buchanan in Palm Beach County, Florida," *American Political Science Review* 95:4 (December 2001): 793-810; Henry E. Brady, Michael C. Herron, Walter R. Mebane Jr., Jasjeet Singh Sekhon, Kenneth W. Shotts, Jonathan Wand, "Law and Data: the Butterfly Ballot Episode (Al Gore and George Bush's Not-So-Excellent Adventure)," *PS: Political Science & Politics* 34:1 (March 2001): 59-69; Michael Coppedge, "The Dynamic Diversity of Latin American Party Systems," *Party Politics* 4:4 (October 1998): 547-568.

Graded Assignment for Sept. 23 (5%): Do the problem set on standard errors, sample sizes, and confidence intervals.

### Sept. 23: T-Tests: Which Average Is Bigger, Really?

There are other techniques for figuring out whether two averages are really different from each other, as opposed to accidentally different. Here you will learn about difference of means tests ("t-tests").

- PSRM chapters 11 (393-416 only)
- Edward Tufte, *Data Analysis for Politics and Policy* (Prentice-Hall, 1974), chapter 1 (pp. 1-30).

Recommended: PSRM chapter 12 (pp. 462-477 only).

Graded Assignment for Sept. 28 (5%): I will give you data on economic performance under Republican and Democratic administrations. You will perform a t-test to determine whether one party's performance has been significantly better than the other's, and interpret the results.

### Sept. 28: Survey Datasets and Codebooks

We will discuss a survey of global attitudes as an example of a descriptive survey report. Then you will learn to download survey data for your own analysis.

- PSRM chapter 10.
- Pew Global Attitudes Project, "Global

Economic Gloom – China and India Notable Exceptions,” (Pew Research Center for the People and the Press: June 12, 2008) [“PewGlobalAtts2008.pdf”] on course webpage.

#### Graded Assignment for Sept. 30 (15%):

Generate your own report based on at least 5 variables from the 2008 Pew survey, the General Social Survey, or the American National Election Study, or any other survey you would like to use. It must employ some measures of central tendency and dispersion and include some informative graphics. Further instructions will be given in class.

#### **Sept. 30: Scatterplots**

Scatterplots are a beautiful way to get a quick, intuitive idea about the relationship between two continuous variables and the possible reasons for the relationship. You will read an influential example with many scatterplots and learn to produce them in various ways in Excel and SPSS. We will also discuss how to interpret scatterplots.

- Robert D. Putnam, Robert Leonardi, Raffaella Y. Nanetti, and Franco Pavoncello, “Explaining Institutional Success: The Case of Italian Regional Government,” *American Political Science Review* 77:1 (March 1983): 55-74.

Ungraded exercise for Oct. 5: Generate and interpret three scatterplots using any of the datasets introduced in this class. Prepare to present and interpret the most interesting one in class.

#### **Oct. 5: Exploring Scatterplots**

Give an oral presentation presenting and interpreting one scatterplot using any relevant dataset. Interpretations should (quickly!) identify what the variables measure; the nature of the sample; whether there seems to be an

association; whether it looks strong or weak, positive or negative, linear or non-linear; and what hypothesis might explain what you observe—including which variable is dependent. Be prepared to critique the scatterplots presented by your classmates.

#### **Oct. 7: Bivariate Regression**

A more useful way to assess the relationship between two variables is to estimate a regression. In class, we will do the RVLS simulations of [Regression by Eye](#), but you should experiment with it on your own, too.

- PSRM chapter 12 (477-490)
- Michael S. Lewis-Beck and Tom W. Rice, "Forecasting Presidential Elections: A Comparison of Naive Models," *Political Behavior* 6:1 (1984): 9-16 ONLY.

Ungraded exercise for Oct. 12: Study my Excel spreadsheet on bivariate regression until you understand what it is doing. Create your own regression spreadsheet from scratch. Use it to do a regression, using two interesting variables from any of the datasets we have found, and check your results with SPSS.

#### **Oct. 12: Regression, Correlation, and Non-linear Relationships**

Correlation coefficients are very common statistics for the association among two variables. You will learn to create them and interpret them correctly. You will also read an influential example from democratization research that discusses non-linear relationships and how to model them.

- PSRM chapter 12 (490-502).
- Jeffrey A. Segal and Albert D. Cover, "Ideological Values and the Votes of United States Supreme Court Justices" *American Political Science Review* 83:2 (June 1989): 557-565.
- R.W. Jackman, "On the Relation of Economic Development and Democratic

Performance," *American Journal of Political Science* 17 (1973): 611-21.

Ungraded assignment for Oct. 14: Explore some bivariate relationships with regression, correlation, and scatterplots, using at least one political variable from any dataset you wish. Choose one relationship to present to the class.

#### **Oct. 14: Exploring Bivariate Regression**

You will present one bivariate relationship you have tested to show that you understand how to interpret all the regression statistics. Half the class will do this today.

#### **Oct. 26: Exploring Bivariate Regression**

The other half of the class presents its bivariate regressions.

#### **Oct. 28: Cross-Tabulation, Strength and Significance**

We should not do regression when the dependent variable is not continuous, which is often the case in surveys. However, we can cross-tabulate such variables. You will read a politically important example of this and learn to interpret such tables and produce them yourself. Often it is useful to calculate a summary statistic to measure the strength of association in a table. However, some relationships that seem strong may be accidents, the result of chance. How can we find out how much of a danger a chance association is? As an example, you will read a landmark attempt to determine whether governments are responsive to the wishes of voters.

- PSRM chapter 12 (pp. 426-462 only).
- Benjamin I. Page and Robert Y. Shapiro, "The Effects of Public Opinion on Policy," *American Political Science Review* 77:1 (March 1983): 175-190.

Recommended: rest of PSRM chapter 12 (338-50); Ada

W. Finifter and Ellen Mickiewicz, "Redefining the Political System of the USSR: Mass Support for Political Change," *American Political Science Review* 86 (December 1992): 857-874.

Ungraded Assignment for Nov. 2: Generate and interpret four cross-tabs using General Social Survey data, an American National Election Study, the 2008 Global Attitudes Project data, or other survey data. Calculate appropriate strength-of-association statistics and Chi-square significance and write a brief (a few sentences) interpretation of each.

#### **Nov. 2: Exploring Cross-Tabs**

You will present your own discoveries and hear about others'.

#### **Nov. 4 Exploring Cross-Tabs**

You will present your own discoveries and hear about others'.

Graded assignment for Nov. 9 (15%): Write up your cross-tabs analysis. Preface it with a description of the data, variables, and sample, pose a good set of questions, format your tables nicely, and write a few sentences interpreting each one.

#### **Nov. 9: Multivariate Regression**

Sometimes what appears to be a relationship between Y and X is really a relationship between Y and Z in disguise. Multivariate regression enables us to hold Z (in fact, often many Zs) constant so we can tell whether the alleged relationship between Y and X is still there.

- PSRM chapter 13 (pp. 503-526 only)
- Finish Michael S. Lewis-Beck and Tom W. Rice, "Forecasting Presidential Elections: A Comparison of Naive Models," *Political Behavior* 6:1 (1984): 16-21 only.

Ungraded assignment for Nov. 11: Using the Inglehart and Welzel 2005 data from the

course website, estimate a multivariate model explaining the level of Effective Liberal Democracy 2000-2002 (v21). Several students will be invited to present their models to the class.

### **Nov. 11: Exploring Multivariate Regression**

Presentations of models of Effective Liberal Democracy.

- Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge University Press, 2005), chapter 2: "Value Change and the Persistence of Cultural Traditions," pp. 48-61 only.

Recommended: Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge University Press, 2005), chapter 7: "The Causal Link between Democratic Values and Democratic Institutions: Theoretical Discussion," pp. 149-172.

Ungraded assignment for Nov. 16: Either use the Amorim Neto and Cox dataset to develop and test an explanation of the Effective Number of Parties, or use the Green and Krasno dataset to develop and test an explanation of campaign spending by incumbents in House elections. I will be asking everyone to report on what they discovered.

### **Nov. 16: Regression with Interactions**

We use interactions to model situations in which the impact of X on Y depends on some other condition. Here we discuss two interesting examples. One asks whether the number of successful parties in a country is the result of social cleavages, election laws, or an interaction between them. The other assesses the impact of incumbent's spending and challenger "quality" on congressional election races. I will also show you how to

generate and interpret residuals and partial plots and explain why you should do this.

- Octavio Amorim Neto and Gary W. Cox, "Electoral Institutions, Cleavage Structures, and the Number of Parties," *American Journal of Political Science* 41:1 (January 1997): 149-174.
- Donald Philip Green and Jonathan S. Krasno, "Salvation for the Spendthrift Incumbent: Reestimating the Effects of Campaign Spending in House Elections," *American Journal of Political Science* 32:4 (November 1988): 884-907.

Ungraded Assignment for Nov. 18: Do your own multivariate regression analysis that involves an interaction, using data of your choice. Prepare to present it to the class.

### **Nov. 18: Exploring Regression with Interactions**

Present and discuss your own multivariate regression analyses with interactions.

### **Nov. 23: Exploring Regression with Interactions**

Present and discuss your own multivariate regression analyses with interactions.

Assignment for Nov. 30 (15%): Write up your findings, including a table or graph simulation that helps explain the interaction effect.

### **Nov. 30: Logistic Regression**

Ordinary multiple regression is fine when you are trying to explain something that is continuous. But when your dependent variable is an either-or, yes-or-no kind of thing, a different estimator is required: logistic regression. The interpretation of logistic regression coefficients is especially tricky, so I will show you how to create a spreadsheet to translate coefficients into probabilities. You will read a model of whether people turn out to vote or not.

- PSRM chapter 13 (526-549)
- Craig Leonard Briens and Bernard Grofman, "Election Day Registration's Effect on U.S. Voter Turnout," *Social Science Quarterly* 82:1 (March 2001): 170-183.

Recommended: David Niven, "The Mobilization Solution? Face-to-Face Contact and Voter Turnout in a Municipal Election," *The Journal of Politics* 66:3 (August 2004): 868-884; Adam Przeworski, Michael Alvarez, José Antonio Cheibub, and Fernando Limongi, "What Makes Democracies Endure?" *Journal of Democracy* 7:1 (January 1996): 39-55. Their dataset is available on the course webpage as "ACLP.sav"

Ungraded exercise for Dec. 2: Do your own logistic regression analysis of your choice. Prepare a class presentation that interprets your findings, including a graph or table of predicted probabilities.

### **Dec. 2: Exploring Logistic Regression**

Present and discuss your own logistic regression analyses. Half of class today.

### **Dec. 7: Exploring Logistic Regression**

Present and discuss your own logistic regression analyses. The other half of the class today.

Graded assignment for Dec. 9 (10%): Write up your logistic regression analysis.

### **Dec. 9: Putting Quantitative Testing in Context; Glimpses of What Lies Beyond**

I will return to the overview presented in the first class to compare the strengths and weaknesses of quantitative analysis with other methods used in political science. Then I will give a quick tour of where you can go from here: factor analysis, log-linear models, time-series analysis, pooled cross-sectional time-series analysis, ARIMA models, and structural equations. You will not be responsible for this material on the final exam.

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I would be happy to hold a review session on December 9 or 10.

### **Final Exam**

The final exam (20 percent of the grade) is a take-home that will be distributed by email or online on Friday, December 11, and will be due Monday, December 14 at 10:00 am (the end of the exam period assigned for this class). I will give you two datasets you have never seen before, with codebooks if necessary, and a series of substantive questions. You will have to choose appropriate methods to analyze the data and must write appropriate interpretations of your findings.