

**Public Policy Methods II**  
**Spring 2009**  
**POL 60004, 70004**  
**Moulton Hall 302, Thursdays 6:15-8:55**

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Office Hours: Tuesday 9:00-2:00 p.m. And by appointment.

**Purpose:**

This course continues and builds upon the material covered in Public Policy Methods I. Beginning with ordinary least squares (OLS), we will cover the assumptions underlying the model. The first portion of the course will focus on diagnostic techniques for finding violations and assessing their severity. Once proficient at identifying potential problems, we will develop empirical methods for overcoming assumption violations with particular attention to modeling and interpreting statistical interactions among independent variables and functional form transformations.

The latter portion of the seminar we will devote to developing an estimator for use with limited and ordinal dependent variables. While amazingly robust, OLS is ill-equipped for many (possibly most) of the phenomena studied by political scientists. A wide variety of political phenomena are best described as binary or ordinal outcomes. Either a citizen turned out to vote or did not turn out to vote. A member of congress either voted for a bill or against it. Americans are either Democrats or Republicans or Independents, liberals, moderates, or conservatives and so on. In short, many dependent variables are neither continuous nor normally distributed and the robustness of OLS estimates is dubious at best. Maximum-likelihood estimation (MLE) overcomes the restrictive assumptions of OLS. We will learn several MLE models. For binary dependent variables, we will learn the probit and logit models. For ordinal dependent variables, we will learn the ordered probit and ordered logit models. And the main text also covers a variety of additional models for future self-study.

We will again be using STATA, and the main text for the MLE portion of the course is designed to teach MLE to STATA users. This will be tremendously helpful, since obtaining substantive information from MLE estimates is considerably more involved than with OLS. In brief, MLE relaxes the linearity assumption. This means that coefficients can no longer be interpreted, “A one unit change in X is associated with a  $\beta$  unit change in Y.” The effect of each variable

depends upon values of the other variables. To show those effects, we will learn how to manipulate variable values and calculate predicted probabilities using the MLE estimates. Obtaining MLE estimates is actually quite simple, but making the most of them requires considerable skill. This course is designed to help you develop those skills.

Even more than Public Policy Methods I, this course is an applied research methods course. Homework assignments will involve work with real datasets and mastery of both course concepts and STATA techniques. In addition to regular homework assignments, there will be two hypothesis note assignments (an empirical test of a research question and an in-class presentation) and a final paper (which may expand on one of the hypothesis notes).

## Requirements

Come to class having read the materials listed for that class entry on the syllabus and be prepared to raise questions and discuss it. Exercises are due at the beginning of the class. Late homework will not be accepted for credit. Please plan your schedules so that you are not doing the exercises at the last minute, as computer glitches of all sorts are possible (and when learning a new statistical package they are part of the assignment). Computing problems are not an acceptable excuse for missing the homework deadline.

Hypothesis notes will stimulate thinking about researchable questions as you conduct a basic test of a narrow hypothesis inspired from the literature in a field that interests you. Notes will be 3-4 pages in length, including a brief summary of the relevant literature, a concise statement of your hypothesis and how it relates to the literature, a brief description of how you intend to test your hypothesis, and a brief description of the results of your test (plus bibliography, tables, and figures). Presentations should outline the basic question and describe the test and results (5-8 min.). The first note will use OLS and should involve an interval- or ratio-level dependent variable. The second note will use MLE and should involve either a nominal- or ordinal-level dependent variable.

For the final paper you may continue to research one of the topics from your hypothesis notes or you may work on a new topic, but you must use MLE and therefore the dependent variable should be either a nominal- or ordinal-level variable. The goal is to produce the type of manuscript that you could (eventually) submit for publication in a journal. Please see the *Style Manual for Political Science*, published by the American Political Science Association, for formatting. The final paper should be 15-20 pages in length plus a 150 word abstract and title page. Each paper will consist of introductory sections identifying the scholarly literature, outlining your research question, and describing your potential contribution to the literature; a data and methods section describing your data and the statistical model designed to answer your research question; a section describing the results of your tests and presenting results in tables and figures; a conclusion; and a bibliography.

The basic break-down of the course grade is as follows:

- Participation: 5%
- Homework Exercises: 20%

- Hypothesis Notes: 45%
- Final Paper: 30%

Incompletes will not be granted except in the case of extreme, documented, non-academic, emergencies.

## **Books**

Aldrich, John H. and Forrest D. Nelson. 1984. *Linear Probability, Logit, and Probit Models*. Sage University Paper Series. Beverly Hills: Sage.

Berry, William D. 1993. *Understanding Regression Assumptions*. Sage University Paper Series. Beverly Hills: Sage.

Berry, William D. and Stanley Feldman. 1985. *Multiple Regression in Practice*. 2<sup>nd</sup> ed. Sage University Paper Series. Beverly Hills: Sage.

Fox, John. 1991. *Regression Diagnostics*. Sage University Paper Series. Beverly Hills: Sage.

Hamilton, Lawrence. (2004). *Statistics with STATA*. Belmont, California: Thomson Learning.

Jaccard, James and Robert Turrisi. 2003. *Interaction Effects in Multiple Regression*. 2<sup>nd</sup> ed. Sage University Paper Series. Beverly Hills: Sage.

Long, J. Scott and Jeremy Freese. 2006. *Regression Models for Categorical Dependent Variables Using STATA*. 2<sup>nd</sup> ed. College Station, TX: Stata Press.

## **Disability Policy**

University policy 3342-3-18 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit [www.kent.edu/sas](http://www.kent.edu/sas) for more information on registration procedures).

## **Class Schedule**

- January 22—Welcome and overview
- January 29—Assumptions and Criteria of Good Estimators
  - Berry, Introduction, Chs. 1-4
  - Berry and Feldman, Introduction, Ch. 1

- Fox, Introduction, Ch. 1
- February 5—Specification Error, Measurement Error, Outliers, Leverage Points, and Influential Data
  - Fox Ch. 4
  - Berry and Feldman, Chs. 2-3
  - Berry, p. 30-41, 49-60
  - Homework 1 Due
- February 12—Linearity and Additivity
  - Berry and Feldman, Ch. 5
  - Berry, p. 60-66
  - Fox, Ch. 7
  - Homework 2 Due
- February 19—Statistical Interaction
  - Jaccard and Turrisi, p. 1-60
  - Work on hypothesis notes
- **February 26—First hypothesis note due. In-class presentations.**
- March 5—Multicollinearity
  - Berry and Feldman, Ch. 4
  - Berry, p. 24-27, 40
  - Fox, Ch. 3
- March 12—Heteroskedasticity and Autocorrelation
  - Fox, Chs. 5-6
  - Berry and Feldman, Ch. 6
  - Berry, p. 41-45, 67-81
  - Homework 3 Due

- March 19—Examples of Applied Regression
  - Read the articles circulated by your classmates, be prepared to lead a discussion of your article.
  - Homework 4 Due
- March 26—Spring Recess
- April 2 cancelled for MPSA
- April 9—Logit and Probit Models
  - Aldrich and Nelson, 9-47
  - Long and Freese, Chap. 4
  - Homework 5 Due
- April 16—Interpretation and Presentation of MLE
  - SPost: Long and Freese, 9-15 & Chap. 3
  - Work on hypothesis notes.
- **April 23—Second hypothesis note due. In-class presentations.**
- April 30—Ordered Probit and Ordered Logit Models
  - Long and Freese, Chap. 5
- April 7—Applications and general catch-up
  - Homework 6 Due
- May 7: Informal Discussion About Final Papers
- May 14: Final papers due in my department mail box by 4:00 p.m.