POL 497 – Quantitative Research Methods
Spring 2018
Tuesday-Thursday, 4:00-5:15 PM
Schroeder 216

Instructor: Dr. Carl L. Palmer
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Course Objectives:

This course is designed to familiarize students with intermediate and advanced statistical modeling techniques. Whether you seek to be a consumer or producer of academic research, familiarity with these models will be invaluable tools. We will briefly review more basic descriptive statistical techniques before moving to the OLS regression model, including a discussion of its assumptions, how to assess the quality of the model you have estimated, and diagnostic measures to facilitate the unbiasedness of your estimates. We will then move to more advanced statistical models, including binary, ordinal, and multinomial models before concluding with count and survival modeling techniques. We will primarily focus on implementing these models using the Stata statistical software, which is available for student use in the Politics and Government departmental lab in 216 Schroeder Hall. As a courtesy, students **should always** check with the main office to be certain the lab is not in use by other faculty.

By the completion of this course, students should be capable of critically evaluating published research on both theoretical and empirical grounds following the completion of this course. In addition, they should be capable of producing their own publication-quality research.

This course is primarily designed as a lecture; I expect that students **will** arrive prepared for class, so as to best comprehend the material. With that said, students should take an active engagement in class and ask any and all questions they have with the material during lecture. The success of this class depends upon **all** students comprehending the material.

Required Readings:

- Berry, William D. 1993. *Understanding Regression Assumptions*. Newbury Park: Sage Publications.
- Berry, William D. and Stanley Feldman. 1985. *Multiple Regression in Practice*. Newbury Park: Sage Publications
- Fox, John. 1991. *Regression Diagnostics*. Newbury Park: Sage Publications.
- Lewis-Beck, Colin, and Michael Lewis-Beck. 2016. *Applied Regression: An Introduction*. Second Edition. Newbury Park: Sage Publications.
- Additional readings will be made available via ReggieNet.

Course Policies:

1. Academic dishonesty will not be tolerated. Please see the university's policies regarding plagiarism and cheating online at the Dean of Students Office website.
2. Assignments submitted electronically *will not be accepted*. All assignments must be submitted *at the beginning of class* on the due date in the syllabus; late assignments will lose 10% credit per day late. All assignments *must* be typed unless otherwise instructed.
3. Usage of cell phones in class will not be permitted. Please silence all cell phones before coming to class.
4. If you have special needs that require accommodation, please let me know early on so that the appropriate measures can be taken. You will be required to provide documentation of your requirements.

Course Requirements:

Assignments (40%):
An important component of developing your methodological toolkit is not simply reading and discussing the material, but actually getting your hands dirty with data. There will be a series of assignments, with due dates listed in the syllabus. You will be given access to data and asked to test hypotheses, analyze model fit, and discuss your findings. Ass assignments, unless otherwise noted, should be typed, and all statistical output should be formatted into tables rather than simply pasting raw output into the assignment.

Final Paper (50%):
There will be a required 20-25 page (double-spaced) research paper, due on the day of the final exam. Your paper should be modeled after an academic research article, and contain the following components: 1) a general introduction stating your research question and a statement of its significance, 2) a review of the literature, developing a theoretical framework for your project, 3) a series of hypotheses derived from your review of the literature, 4) a discussion of the data and methods you will use to test your hypotheses, 5) a discussion of your empirical findings, and 6) a discussion and conclusion that summarizes your findings and reiterates its contribution to our understanding of the phenomena being analyzed. My expectation is that you will use regression analysis, but may use one of the more advanced techniques we will discuss during the term.

I would advise that you answer a question that may be addressed using existing data sources. The Inter-University Consortium for Political and Social Research (ICPSR) maintains a repository of datasets that could be useful. In addition, the American National Election Survey and General Social Survey contain a number of useful questions for those of you interested in American political behavior.

Class Presentation and Discussion (10%):
The final class meetings you will present your research paper and provide comments for one of your colleagues' work. Your grade will be determined by the quality of your presentation, and

the thoughtful comments you provide for the paper you discuss.

Course Schedule:

Week 1: Making Science
Jan. 16 – Introductions and syllabus
Jan. 18 – Theory, Hypotheses, and Causal Inference
- King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing Social Inquiry*: *Scientific Inference in Qualitative Research*. Princeton: Princeton University Press. (Chs 1,3).

Week 2: Bivariate and Multivariate Regression
Jan. 23 – Bivariate OLS Regression
- *Applied Regression* (Chs. 1-2)
- Wonnacott, Thomas H. and Ronald J. Wonnacott. 1986. *Regression: A Second Course in Statistics*. Malabar, FL: Krieger Publishing Company. (Ch 2).
Feb. 7 – Multivariate OLS Regression
- *Applied Regression*. (Ch 3).
- Wonnacott, Thomas H. and Ronald J. Wonnacott. 1986. *Regression: A Second Course in Statistics*. Malabar, FL: Krieger Publishing Company. (Ch 3).

Week 3: Regression with Dummy Variables and Interactive Models
Jan. 30 – Dummy Regression
- Hardy, Melissa. 1993. *Regression with Dummy Variables*. Newbury Park: Sage Publications. (Chs 1-3).
- Wonnacott, Thomas H. and Ronald J. Wonnacott. 1986. *Regression: A Second Course in Statistics*. Malabar, FL: Krieger Publishing Company. (Ch 4, pp. 104-115).
Feb. 1 – Estimating and Interpreting Interactive Models
- Jaccard, James, and Robert Turrisi. 2003. *Interactive Effects in Multiple Regression*. Newbury Park: Sage Publications. (Chs 1-2).
- Kam, Cindy D., and Robert J. Franzese, Jr. 2007. *Modeling and Interpreting Interactive Hypotheses in Regression Analysis*. Ann Arbor: University of Michigan Press. (Ch 3).

Week 4: Regression Assumptions and Model Fit
Feb. 6 – Regression Assumptions
- *Understanding Regression Assumptions* (Chs. 2, 4).
- *Multiple Regression in Practice* (Ch 1).
Feb. 8 – Assessing Goodness of Fit
- Hamilton, Lawrence. 1996. *Data Analysis for Social Scientists*. New York: Duxbury Press. (Ch 9, pp. 326-32).

- King, Gary. 1990. "When Not to Use R-Squared." *The Political Methodologist*. 3(2): 11-12.
- Lewis-Beck, Michael S. 1990. "When to Use R-Squared." *The Political Methodologist*. 3(2): 9-11.

Week 5: Regression Diagnostics: Model Specification and Measurement Error – Assignment 1 due 2/15
Feb. 13 – Specification Error
- *Multiple Regression in Practice* (Ch 2).
- *Understanding Regression Assumptions* (Ch 5. pp. 30-41).
Feb. 15 – Measurement Error
- *Multiple Regression in Practice* (Ch 3).
- *Understanding Regression Assumptions*. Newbury Park: Sage Publications (Ch 5. pp. 45-60).

Week 6: Regression Diagnostics: Multicollinearity and Outliers
Feb. 20 – Multicollinearity
- *Multiple Regression in Practice* (Ch 4).
- *Regression Diagnostics* (Ch 3).
Feb. 22 – Outliers
- Bollen, Kenneth A., and Robert W. Jackman. 1990. "Regression Diagnostics: An Expository Treatment of Outliers and Influential Cases." In Fox, John, and J. Scott Long, eds. *Modern Methods of Data Analysis*. Newbury Park: Sage Publications.
- *Regression Diagnostics* (Ch 4).

Week 7: Regression Diagnostics: Heteroskedasticity and Autocorrelation – Assignment 2 due 2/29
Feb. 27 – Heteroskedasticity
- *Regression Diagnostics* (Chs. 5-6).
Feb. 29 – Autocorrelation
- *Multiple Regression in Practice* (Ch 6, pp. 77-78, 85-88).
- Ostrom Jr., Charles W. 1990. *Time Series Analysis: Regression Techniques*. Newbury Press: Sage Publications. (Ch1, Ch2 pp. 5-30).

Week 8: Paper Conferences – data sources due
Mar. 6 & 8 - TBA

Week 9 – Spring Break
Mar. 13 – no class
Mar. 15 – no class

Week 10: Binary Models – Assignment 3 due 3/22
Mar. 20 & 22 – Binary Regression models
- Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks: Sage Publications. (Ch 3).
- Sullivan, Patricia L. 2009. War Aims and War Outcomes: Why Powerful States Lose Limited Wars." *Journal of Conflict Resolution*. 51(3): 496-524

Week 11: Ordinal Models
Mar. 27 & 29 – Ordinal Regression models
- Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks: Sage Publications. (Ch 5).
- Kam, Cindy D., and Beth A. Estes. 2016. "Disgust Sensitivity and Public Demand for Protection." *Journal of Politics*. 78(2): 481-96.
- McKibben, Heather Elko. 2013. "The Effects of Structures and Power on State Bargaining Strategies." *American Journal of Political Science*. 57(2): 411-27.

Week 12: Multinomial Models
Apr. 3 – Multinomial models
- Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks: Sage Publications. (Ch 6).
- TBA
Apr. 5 – **MPSA meeting – no class**

Week 13: Paper Conferences – preliminary analyses due
Apr. 10 & 12 – TBA

Week 14: Count Models – Assignment 4 due on 4/19
Apr. 17 & 19 – Count models
- Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks: Sage Publications. (Ch 8).
- TBA

Week 15: Duration Models
Apr. 24 & 26 – Duration models
- Allison, Paul D. 1984. *Event History Analysis: Regression for Longitudinal Event Data*. Beverly Hills: Sage Publications. (Chs 1-4).
- Box-Steffensmeir, Janet M., and Bradford Jones. 1997. "Time is of the Essence: Event History Models in Political Science." *American Journal of Political Science*. 41(4): 1414-61.

Week 16: Final Presentations
Apr. 30 – Presentation group 1
May 2 – Presentation group 2