

POL 682: ADVANCED STATISTICAL MODELING

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POL 682: Th: 9:00 – 11:50 am

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Office Hours: Tuesday 9-12, by appointment

REQUIRED TEXTBOOKS:

Rabe-Hesketh, Sophia, and Andres Skrondal. 2008. *Multilevel and Longitudinal Modeling Using Stata*. 2nd Edition. Stata Press.

Raudenbush, Stephen, and Anthony Bryk. 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods*. 2nd Edition. Sage.

Box-Steffensmeier, Janet, and Bradford Jones. 2004. *Event History Modeling: A Guide for Social Scientists*. Cambridge University Press.

COURSE OVERVIEW:

We will examine three broad classes of models this semester: time series models, panel and multilevel models, and duration models. We will be covering both the logic of each approach and the statistical properties of the estimation procedures. We will also deal with statistical software issues – we will focus on using Stata, but the freely available R and WinBugs will also be used. The readings are a mixture of statistical theory and applications. Generally, the readings that are starred are applied research; the non-starred readings focus more on the statistical properties of the particular model.

GRADING

2 Papers: 40% each
Presentations and Participation: 20%

The two papers will be original analyses covering two of the three major topics (for example, 1 multilevel paper, 1 duration model). You may collaborate on 1 of the 2 papers with another graduate student if you wish. The first paper is due no later than November 19th and the second is due December 17th. Be advised I will give no extensions and no incompletes. The papers must be new work: you are not to recycle paper topics from past courses.

Each student is also responsible for the presentation of two applied articles. Starting with the material on September 10th, all starred readings are available as possible presentation topics. The presentation will cover the statistical and substantive issues in the article. It should also raise critical comments on the research and issues for class discussion. The presentations and general class participation count toward the remaining 20% of the grade.

August 27 – Intro / Intro to Time Series

Hibbs, D. 1974. “Problems of Statistical Estimation and Causal Inference in Time-Series Regression Models.” *Sociological Methodology* 1973-4: 252-308.

*MacKuen, R. Erikson, and J. Stimson. 1989. "Macropartisanship." *American Political Science Review* 83: 1125-1142.

*Alt, J. 1985. "Political Parties, World Demand, and Unemployment: Domestic and International Sources of Economic Activity." *American Political Science Review* 1016-1040.

*Li, R. 1976. "A Dynamic Comparative Analysis of Presidential and House Elections" *American Journal of Political Science* 20: 671-691.

*Norpoth, H. and T. Yantek. 1983. "Macroeconomic Conditions and Fluctuations of Presidential Popularity: The Question of Lagged Effects." *American Journal of Political Science* 27: 785-807.

Beck, N. 1991. "Comparing Dynamic Specifications: The Case of Presidential Approval." *Political Analysis* 3: 51-87

September 3 – no class

September 10 – Nonstationary Time Series

DeBoef, S. and J. Granato. 1997. "Near Integrated Data and the Analysis of Political Relationships." *American Journal of Political Science*. 41: 619-640.

Durr, R. 1993. "An Essay on Cointegration and Error Correction Models." *Political Analysis* 5: 185-228.

DeBoef, S. and L. Keele. 2008. "Taking Time Seriously." *American Journal of Political Science*. 52: 184-200..

*Caldeira, G, and C. Zorn. 1998. "Of Time and Consensual Norms in the Supreme Court." *American Journal of Political Science*. 42: 874-902

*Keele, L. 2007. "Social Capital and the Dynamics of Trust in Government." *American Journal of Political Science*. 51: 241-254.

*Clarke, H., M. Stewart, and P. Whiteley. 1998. "New Models for New Labor: The Political Economy of Labour Party Support, January 1992-April 1997." *American Political Science Review* 92: 559-575.

September 17 – Multiple Equation Time Series – VAR and Granger Causality

Freeman, J. 1983. "Granger Causality and the Time Series Analysis of Political Relationships." *American Journal of Political Science* 27: 327-358.

Freeman, J., J. Williams, and T. Lin. 1989. "Vector Autoregression and the Study of Politics." *American Journal of Political Science* 33: 842-877.

Freeman, J., D. Houser, P. Kellstadt, and J. Williams. 1998. "Long-memored Processes, Unit Roots, and Causal Inference in Political Science." *American Journal of Political Science* 42: 1261-1288.

*Goldstein, J and J. Freeman. 1991. "US-Soviet-Chinese Relations: Routine, Reciprocity, or Rational Expectations?" *American Political Science Review* 85: 17-35.

*Williams, J. and B. Collins. 1997. "The Political Economy of Corporate Taxation." *American Journal of Political Science* 41: 208-244.

September 24 – Panel and Pooled Cross-Section Models – Usual Suspects

Stimson, J. 1985. "Regression in Space and Time: A Statistical Essay." *American Journal of Political Science* 29: 914-947.

Beck, N. and J. Katz. 1995. "What to Do (and not to do) with Time-Series Cross-Section Data." *American Political Science Review* 89: 634-647.

Beck, N. and J. Katz. 1996. "Nuisance vs Substance: Specifying and Estimating Time-Series Cross-Section Models." *Political Analysis* 6: 1-36.

Wawro, Gregory. 2002. "Estimating Dynamic Panel Data Models in Political Science." *Political Analysis* 10: 25-48.

*Wawro, Gregory. 2001. "A Panel Probit Analysis of Campaign Contributions and Roll-Call Votes." *American Journal of Political Science* 45: 563-579.

Wilson, S. and D. Butler. 2007. "A Lot More to Do: The Sensitivity of Time-Series Cross-Section Analyses to Simple Alternative Specifications." *Political Analysis* 15: 101-123. [note special issue].

October 1 – Intro to Multilevel Models – Motivations

R-H and S: Ch 2 / R & B: Chs 1-2, 4

Steenbergen, M. and B. Jones. 2002. "Modeling Multilevel Data Structures." *American Journal of Political Science* 46: 218-237.

*Jerit, J., Barabas, J, and T. Bolsen. 2006. "Citizens, Knowledge, and the Information Environment." *American Journal of Political Science* 50: 266-282.

*Elkins, Z, and J. Sides. 2007. "Can Institutions Build Unity in Multiethnic States?" *American Political Science Review* 101: 693-708.

October 8 – Multilevel Models: Estimation

R & B Chs 3, 9

Franzese, R.. 2005. “Empirical Strategies for Various Manifestations of Multilevel Data.” *Political Analysis* 13: 430-466.

Bowers, J. and K. Drake. 2005. “EDA for HLM: Visualization when Probabilistic Inference Fails.” *Political Analysis* 13: 301-326.

Heagerty, P, and S. Zeger. 2000. “Marginalized Multilevel Models and Likelihood Inference.” *Statistical Science*. 15: 1-26.

Arceneaux, K, and D. Nickerson. 2009. “Modeling Certainty with Clustered Data: A Comparison of Methods.” *Political Analysis* 17: 177-190.

October 15 – Multilevel Models: Estimation

R & B Chs 13-14.

*Western, B. 1998. “Causal Heterogeneity in Comparative Research.” *American Journal of Political Science* 42: 1233-1259.

Shor, B., J. Bafumi, L. Keele, and D. Park. 2007. “A Bayesian Multilevel Modeling Approach to Time-Series Cross-Sectional Data.” *Political Analysis* 15: 165-181.

Gelman, A. and I. Pardoe. 2006. “Bayesian Measures of Explained Variance and Pooling in Multilevel (Hierarchical) Models.” *Technometrics* 48: 241-251.

October 22 – Multilevel Models: Applications

R-H and S: Chs 3-5 / R & B: Chs 5-6

Guo, G and H. Zhao. 2000. “Multilevel Modeling for Binary Data.” *Annual Review of Sociology*. 26: 411-462.

*Martin, A. 2001. “Congressional Decision Making and the Separation of Powers.” *American Political Science Review* 95: 361-378.

*Baumer, E., S. Messner, and R. Rosenfeld. 2003. “Explaining Spatial Variation in Support for Capital Punishment: A Multilevel Analysis.” *American Journal of Sociology* 108: 844-875.

*Ward, M., R. Siverson, and X. Cao. 2007. "Disputes, Democracies, and Dependencies: A Reexamination of the Kantian Peace." *American Journal of Political Science* 51: 583-601.

Rodriguez, G., and N. Goldman. 2001. "Improved Estimation Procedures for Multilevel Models with Binary Response: A Case-Study." *Journal of the Royal Statistical Society, Series A* 164: 339-355.

October 29 – Multilevel Models: Applications

R-H & S: Chs 6-7 / R & B: Ch 10

*McFarland, D. 2001. "Student Resistance: How the Formal and Informal Organization of Classrooms Facilitate Everyday Forms of Student Defiance." *American Journal of Sociology*. 107: 612-678.

Gelman, A, and I. Pardoe. 2007. "Average Predictive Comparisons for Models with Nonlinearity, Interactions, and Variance Components." *Sociological Methodology* 37: 23-51.

*Calvo, E., and JP Micozzi. 2005. "The Governor's Backyard: A Seat-Vote Model of Electoral Reform for Subnational Multiparty Races." *Journal of Politics* 67: 1050-1074.

Liu I., and A. Agresti. 2005. "The Analysis of Ordered Categorical Data: An Overview and a Survey of Recent Developments." *TEST* 14: 1-73.

*Rudolph, T. 2003. "Institutional Context and the Assignment of Political Responsibility." *Journal of Politics* 65: 190-215.

November 5 – Multilevel Models: Applications

R-H & S: Ch 9-11 R & B Chs 10-12

*Park, JH, and N. Jensen. 2007. "Electoral Competition and Agricultural Support in OECD Countries." *American Journal of Political Science* 51: 314-329.

Yamaguchi, K. 2008. "Four Useful Finite Mixture Models for Regression Analyses of Panel Data with a Categorical Dependent Variable." *Sociological Methodology* 38: 283-328.

*Plutzer, E. 2002. "Becoming a Habitual Voter: Inertia, Resources, and Growth in Young Adulthood." *American Political Science Review* 96: 41-56.

Muthen, B. 1997. "Latent Variable Modeling of Longitudinal and Multilevel Data." *Sociological Methodology* 27: 453-480.

November 12 – Logic of Duration Models: Parametric Models

B-S and J. *EHM*. Chs 1 – 3.

Box-Steffensmeier, J, and B. Jones. 1997. “Time is of the Essence: Event History Models in Political Science.” *American Journal of Political Science* 41: 1414-1461.

*King, G., J. Alt, M. Laver, and N. Burns. 1990. “A Unified Model of Cabinet Dissolution in Parliamentary Democracies.” *American Journal of Political Science* 34: 847-871.

*Bueno de Mesquita, B. and R. Siverson. 1995. “War and the Survival of Political Leaders.” *American Political Science Review* 89:841-855.

*Bennett, D.S. 1998. “Integrating and Testing Models of Rivalry Duration.” *American Journal of Political Science* 42: 1200-1232.

November 19 – Duration Models: Proportional Hazards Models & Discrete Time Models

B-S and J. *EHM*. Chs 4 – 7.

Box-Steffensmeier, J., and C. Zorn. 2001. “Duration Models and Proportional Hazards in Political Science.” *American Journal of Political Science* 45: 972-988.

*Box-Steffensmeier, J., L. Arnold, and C. Zorn. 1997. “The Strategic Timing of Position Taking in Congress.” *American Political Science Review* 91: 324-338.

*Katz J. and B. Sala. 1996. “Careerism, Committee Assignments, and the Electoral Connection.” *American Political Science Review* 90: 21-33.

Beck, N., J. Katz, and R. Tucker. 1998. “Taking Time Seriously: Time-Series Cross-Section Analysis with a Binary Dependent Variable.” *American Journal of Political Science* 42: 1260-1288.

*Grattet, R., V. Jenness, and T. Curry. 1998. “The Homogenization and Differentiation of Hate Crime Law in the United States, 1978-1995.” *American Sociological Review* 63: 286-307.

Buckley, J., and C. Westerland. 2004. “Duration Dependence, Functional Form, and Correct Standard Errors: Improving EHA Models of State Policy Diffusion.” *State Politics and Policy Quarterly*, 4(1): 94-114.

November 26 – no class

December 3 – Competing Risks, Repeated Events, Heterogeneity & Other Issues

B-S and J. *EHM*. Chs 8 – 11.

R-H & S: Ch 8

Box-Steffensmeier, J. and C. Zorn. 2002. "Duration Models for Repeated Events." *Journal of Politics* 64:1069-1094.

*Diermeier, D. and R. Stevenson. 1999. "Cabinet Survival and Competing Risks." *American Journal of Political Science* 43: 1051-1068.

Gordon, S. 2002. "Stochastic Dependence in Competing Risks." *American Journal of Political Science* 46: 200-217.

Darmofal, D. 2009. "Bayesian Spatial Survival Models for Political Event Processes." *American Journal of Political Science* 53: 241-257.