**PS 431 Maximum Likelihood**

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This course is principally a course in maximum likelihood estimation of problems in political science. One advantage of maximum likelihood approaches is that it allows us to more realistically model political phenomena as processes. With MLE approaches, we can examine phenomena such as turnout in elections or votes for candidates as if they were a series of choices. We can approach the progression of economic conditions or the status of the president over time, where we let time become a part of the process, rather than simply something that we "control." We can model for compliance by subordinates in a bureaucracy allowing for flexibility in the underlying political structure of the principal-agency problem.

My agenda for this class also intends to help advanced students like yourself learn how to handle the dirty work of data analysis. We will learn how to work with a variety of different analytical tools, both for generating estimates of the relationships and for interpreting the results. We will learn how to extract and use data from the public archives. We will work over several different methods for presenting analytical results.

The assignments for this course are two-fold. Half of your grade will be the result of a series of (nearly) weekly assignments. The other half of your grade will be based on a research paper employing one or more of the techniques we learn in this course.

The following books are on order at the bookstore:

- King, *Unifying Political Methodology* (required)
- Harduk, *Structural Equation Modelling with LISREL* (recommended)
- Maddala, *Limited Dependent Variables in Econometrics* (recommended)

In addition, there will be a coursepack of readings available from me for photocopying (as well as from a "hidden" part of my homepage). This coursepack contains an excessive amount of my own work with MLE approaches, which should serve as comic relief.

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| 26 Sept | <u>Introduction</u><br>• King, Ch. 1 – 2. |
| 28 Sept | <u>Properties</u><br>• King, Ch. 4. |
| 3 Oct | <u>Densities; General Method</u><br>• King, Ch. 3. |
| 5 Oct | <u>Probit</u><br>• King, Ch. 5 (first half) |
| 10 Oct | <u>Interpretation of Probit</u><br>• King, Tomz, and Wittenberg. "Making the Most of Statistical Analyses," *AJPS* 44:341–355 (JSTOR) |
| 12 Oct | <u>Alternative Links</u><br>• Brehm and Gates, "Policing Police Brutality" (coursepack) |
| 17 – 19 Oct | <u>Ordered probit</u><br>• Maddala, Ch. 2–3 (coursepack) |
| 24 – 26 Oct | <u>Unordered choices</u><br>• Alvarez and Nagler, "Economics, Issues and the Perot Candidacy," *AJPS* 39:714–744 (JSTOR). |
| 31 Oct – 2 Nov | <u>Tabular models</u><br>• King, Ch. 6 |
| 7 – 9 Nov | <u>Counts</u><br>• King, Ch. 5 (second half)<br>• King, "Variance Specification in Event Count Models," *AJPS* 33: 762–784. |
| 14 – 16 Nov | <u>Multiple Equations in ML</u><br>• King, Ch. 8<br>• Alvarez and Brehm, "American Ambivalence Toward Abortion Policy" (coursepack) |
| 21 – 23 Nov | <u>Measurement Models</u><br>• Hayduk, Ch. 4 |
| 28 – 30 Nov | <u>LISREL</u><br>• Brehm and Rahn, "Individual Level Evidence for the Causes and Consequences of Social Capital" *AJPS* (JSTOR).<br>• King, Ch. 10 |
| | <u>Other topics</u><br>• Duration (event history)<br>• Time–series in ML<br>• Compositional data<br>• Censored data<br>• Heteroskedasticity in ML |