Political Science 599: Intro to Empirical Methods in Political Analysis

Fall 2014
TuTh 4–5:30 (G026 Tisch Hall)
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Office hours: Wed 12–2 or other times by appointment.
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Office hours: Wed and Fri 10:30-12 or other times by appointment.

Course web page: in CTools; syllabus also at `http://www.umich.edu/~wmebane/ps599.html`

Assignment Due Dates

due date	description	weight
TBA	several problem sets	65%
—	participation	15%
Dec 18	final paper	20%

Reading Availability

I've requested that most of the books that are cited as reading sources be placed on 4-hour reserve. Some of the snippets from some of the books are posted on the course C-Tools site.

Class meeting and reading schedule

1. count data, conditional association and Simpson's paradox (Sep 4–11)

   - P. J. Bickel, E. A. Hammel, J. W. O'Connell. 1975. "Sex Bias in Graduate Admissions: Data from Berkeley." *Science* 187 (4175): 398–404. February 7, 1975. DOI: `10.1126/science.187.4175.398`

   - David Freedman, Robert Pisani and Roger Pervis. 1998. *Statistics.* 3rd Edition. Norton. pp. 3–20, 27, 28.

   - John E. Jackson. 1983. "Election Night Reporting and Voter Turnout." *American Journal of Political Science* 27(4): 615–635.

   - Arthur L. Stinchcombe. 1968. *Constructing Social Theories.* Harcourt. pp. 3–56

   - Thad Dunning and Janhavi Nilekani. 2013. "Ethnic Quotas and Political Mobilization: Caste, Parties, and Distribution in Indian Village Councils." *American Political Science Review* 107(1): 35–56.

2. measurement, summary statistics: plots, moments and quantiles (Sep 16–18)

   - W. Phillips Shively. 1990. *The Craft of Political Research.* Prentice-Hall. 44–78.

   - Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan. 2013. *Schaum's Outline of Probability and Statistics*, 4th Ed. McGraw-Hill. Chapters 3, 5.

   - Christopher H. Achen. 1977. "Measuring Representation: Perils of the Correlation Coefficient." *American Journal of Political Science* 21(4): 805–815.

- Eric A. Hanushek and John E. Jackson. 1977. *Statistical Methods for Social Scientists.* Academic Press. Pages 19–21.
- Jeffrey S. Racine. 2008. "Nonparametric Econometrics: A Primer." *Foundations and Trends in Econometrics* 3(1): 1–88, section 2.

Richard A. Becker, William S. Cleveland and Ming-Jen Shyu. 1996. "The Visual Design and Control of Trellis Display." *Journal of Computational and Graphical Statistics* 5(2, June): 123–155.

Deepayan Sarkar. "Lattice: Multivariate Data Visualization with R - Figures and Code." `http://lmdvr.r-forge.r-project.org/`

3. probability, distributions, sampling (Sep 23–25)

- Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan. 2013. *Schaum's Outline of Probability and Statistics.* Chapters 1–2, 4–5.

Casella, George, and Roger L. Berger. 2002. *Statistical Inference.* 2d ed. Brooks/Cole Cengage Learning. Chapters 1–5.

Will H. Moore and David A. Siegel. 2013. *A Mathematics Course for Political & Social Research.* Princeton. Chapters 10–11.

4. parameters and estimation (least squares, moments, ML, Bayes) (Sep-30–Oct 9)

- Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan. 2013. *Schaum's Outline of Probability and Statistics.* Chapters 6, 11.
- Casella, George, and Roger L. Berger. 1990. *Statistical Inference.* Duxbury Press. Sections 7.1–7.3. (same sections in 2d edition)
- Andrew Gelman, John B. Carlin, Hal S. Stern and Donald B. Rubin. 2004. *Bayesian Data Analysis*, 2d ed. Chapman & Hall. Sections 2.1–2.4.

5. hypothesis tests and confidence intervals, posterior distributions (Oct 16–23)

- Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan. 2013. *Schaum's Outline of Probability and Statistics.* Chapters 7, 11.
- A.C. Davison and D.V. Hinkley. 1997. *Bootstrap Methods and their Application.* Cambridge. Sections 2.1–2.6.
- James O. Berger. 2003. "Could Fisher, Jeffreys and Neyman Have Agreed on Testing?" *Statistical Science* 18 (1): 1–12.
- James O. Berger. 2003. "Understanding P-values" (especially try the Java applet). `http://www.stat.duke.edu/~berger/p-values.html`
- Yoav Benjamini and Yosef Hochberg. 1995. Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society, Series B* 57 (1): 289–300.

Casella, George, and Roger L. Berger. 2002. *Statistical Inference.* 2d ed. Chapter 8.

Efron, Bradley. 2010. *Large-scale Inference: Empirical Bayes Methods for Estimation, Testing and Prediction.* Cambridge.

6. contingency tables (Oct 28–30)

   - Alan Agresti. 1990. *Categorical Data Analysis*. Wiley. Chapters 2–3.

7. regression (Nov 4–11)

   - Eric A. Hanushek and John E. Jackson. 1977. *Statistical Methods for Social Scientists*. Chapters 2–4.
   - Edward R. Tufte. 1975. "Determinants of Outcomes of Midterm Congressional Elections." *American Political Science Review* 69(3): 812–826.
   - William H. Greene. 2012. *Econometric Analysis*, 7th Ed. Prentice-Hall. Chapter 2, sections 3.1–3.2, 3.5.
   - Russell Davidson and James G. MacKinnon. 2004. *Econometric Theory and Methods*. Oxford UP. Chapter 2.

   Will H. Moore and David A. Siegel. 2013. *A Mathematics Course for Political & Social Research*. Chapters 12–13.

8. regression estimation (least squares, ML, MCMC) (Nov 13–20)

   - Eric A. Hanushek and John E. Jackson. 1977. *Statistical Methods for Social Scientists*. Chapter 5.
   - William H. Greene. 2012. *Econometric Analysis*, 7th Ed. Chapter 4 and sections 16.1–16.5.
   - Andrew Gelman, John B. Carlin, Hal S. Stern and Donald B. Rubin. 2004. *Bayesian Data Analysis*, 2d ed. Chapman & Hall. Sections 14.1–14.5.

   Will H. Moore and David A. Siegel. 2013. *A Mathematics Course for Political & Social Research*. Chapter 15.

9. trends and spurious regressions, dynamics and autocorrelation (Nov 25)

   - C.W.J. Granger and P. Newbold. 1974. "Spurious Regressions in Econometrics." *Journal of Econometrics* 2: 111–120.
   - Eric A. Hanushek and John E. Jackson. 1977. *Statistical Methods for Social Scientists*. Chapter 6.

10. regression with categorical outcomes (Dec 2)

   - Eric A. Hanushek and John E. Jackson. 1977. *Statistical Methods for Social Scientists*. Chapter 7.
   - A. Colin Cameron and Pravin K. Trivedi. 2005. *Microeconometrics: Methods and Applications*. Cambridge. Chapters 14 and 15.

11. causality (DAGS), causal inference, LATE, field experiments (Dec 4–9)

   - Judea Pearl. 2009. *Causality: Models, Reasoning, and Inference*, 2d ed. Cambridge. Chapter 1, Epilogue.

- Joshua D. Angrist and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics.* Princeton. Chapter 1, section 4.4.
- Holland, Paul. 1986, Statistics and Causal Inference. *Journal of the American Statistical Association* 81: 945–961.

Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach (Strategies for Social Inquiry).* Cambridge.

Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation.* Norton.

Andrew Gelman, John B. Carlin, Hal S. Stern and Donald B. Rubin. 2004. *Bayesian Data Analysis*, 2d ed. Sections 15.1–15.4.

William H. Greene. 2012. *Econometric Analysis*, 7th Ed. Section 16.8.

12. outliers and rank statistics (Dec 9)

- Frank R. Hampel, Elvezio M. Ronchetti, Peter J. Rousseeuw and Werner A. Stahel. 1986. *Robust Statistics: The Approach Based on Influence Functions.* Wiley. Chapter 1.
- Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan. 2013. *Schaum's Outline of Probability and Statistics.* Chapter 10.

13. latent variables and dimension reduction (Dec 9)

- Jon Shlens. 2003. "A Tutorial on Principal Component Analysis: Derivation, Discussion and Singular Value Decomposition." `PCA-Tutorial-Intuition_jp.pdf`
- Eric A. Hanushek and John E. Jackson. 1977. *Statistical Methods for Social Scientists.* Section 10.4.

Will H. Moore and David A. Siegel. 2013. *A Mathematics Course for Political & Social Research.* Chapter 14.

14. final paper presentations (Dec 18, 8–10am)

Following are a few other books you may wish to consult. Many other books may also be helpful. Too many to name! And articles.

Jeff Gill. 2006. *Essential Mathematics for Political and Social Research.* Cambridge.

Jeff Gill. 2007. *Bayesian Methods: A Social and Behavioral Approach.* 2d ed. Chapman & Hall.

Simon Jackman. 2009. *Bayesian Analysis for the Social Sciences.* Wiley.

Jeffrey M. Woolridge. 2002. *Econometric Analysis of Cross Section and Panel Data.* MIT.