

Political Science 599: Intro to Empirical Methods in Political Analysis

Fall 2017

TuTh 4–5:30 (7603 HH)

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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 | 85% |
| — | participation | 15% |

I expect problem sets will be due Sept 19, Oct 3, Oct 19, Nov 7, Nov 21, Nov 30, Dec 12 and Dec 19.

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 Canvass site.

Class meeting and reading schedule

1. count data, conditional association and Simpson's paradox (Sep 7)
 - 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.
2. measurement, summary statistics: plots, moments and quantiles (Sep 12–14)
 - 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.

- Walter R. Mebane, Jr., and Jonathan Wall. 2015. “Election Frauds, Postelection Legal Challenges and Geography in Mexico.” Presented at the 2015 Annual Meeting of the American Political Science Association, San Francisco, CA, September 3–6, 2015. <http://www.umich.edu/~wmebane/apsa15.pdf>
- 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 19–21)
- 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.
- Thomas Lumley. 2010. *Complex Surveys: A Guide to Analysis Using R*. Wiley.
4. parameters and estimation (least squares, moments, ML, Bayes) (Sep 26–Oct 5)
- 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. regression (Oct 10–19)
- 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.

6. regression estimation (least squares, ML, MCMC) (Oct 24–31)

- 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.

7. hypothesis tests and confidence intervals, posterior distributions (Nov 2–14)

- 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.
- 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.
- Ronald L. Wasserstein and Nicole A. Lazar. 2016. “The ASA’s Statement on p-Values: Context, Process, and Purpose” and “ASA Statement on Statistical Significance and P-Values.” *The American Statistician* 70 (2): 129–133.
- Daniel J. Benjamin, James O. Berger, Magnus Johannesson, Brian A. Nosek, E.J. Wagenmakers, Richard Berk, Kenneth A. Bollen, Björn Brembs, Lawrence Brown, Colin Camerer, David Cesarini, Christopher D. Chambers, Merlise Clyde, Thomas D. Cook, Paul De Boeck, Zoltan Dienes, Anna Dreber, Kenny Easwaran, Charles Efferson, Ernst Fehr, Fiona Fidler, Andy P. Field, Malcolm Forster, Edward I. George, Richard Gonzalez, Steven Goodman, Edwin Green, Donald P. Green, Anthony Greenwald, Jarrod D. Hadfield, Larry V. Hedges, Leonhard Held, Teck Hua Ho, Herbert Hoijsink, James Holland Jones, Daniel J. Hruschka, Kosuke Imai, Guido Imbens, John P.A. Ioannidis, Minjeong Jeon, Michael Kirchler, David Laibson, John List, Roderick Little, Arthur Lupia, Edouard Machery, Scott E. Maxwell, Michael McCarthy, Don Moore, Stephen L. Morgan, Marcus Munafó, Shinichi Nakagawa, Brendan Nyhan, Timothy H. Parker, Luis Pericchi, Marco Perugini, Jeff Rouder, Judith Rousseau, Victoria Savalei, Felix D. Schönbrodt, Thomas Sellke, Betsy Sinclair, Dustin Tingley, Trisha Van Zandt, Simine Vazire, Duncan J. Watts, Christopher Winship, Robert L. Wolpert, Yu Xie, Cristobal Young, Jonathan Zinman, Valen E. Johnson. 2017. “Redefine Statistical Significance.” *Nature Human Behavior* (submitted), PsyArXiv Preprints, <https://psyarxiv.com/mky9j>.
- Walter R. Mebane, Jr., and Matthew Bernhard. 2017. “Effects of Voting Technologies and Recount Methods on Votes in Wisconsin and Michigan.” Working paper. <http://www-personal.umich.edu/~wmebane/recount2016.pdf>

James O. Berger and Thomas Sellke. 1987. “Testing a Point Null Hypothesis: The Irreconcilability of P Values and Evidence.” *Journal of the American Statistical Association* 82 (1): 112–122.

- 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>
- 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.
8. trends and spurious regressions, dynamics and autocorrelation (Nov 16)
- 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.
9. contingency tables and regression with categorical outcomes (Nov 21–30)
- Alan Agresti. 1990. *Categorical Data Analysis*. Wiley. Chapters 2–3.
 - 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.
 - John E. Jackson. 1983. “Election Night Reporting and Voter Turnout.” *American Journal of Political Science* 27(4): 615–635.
10. theories and causality (Dec 5–7 (or 12))
- 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.
 - Angrist, Joshua D., Guido Imbens and Donald B. Rubin. 1996. “Identification of Causal Effects Using Instrumental Variables.” *Journal of the American Statistical Association* 91(June): 444–455.
 - Holland, Paul. 1986, “Statistics and Causal Inference.” *Journal of the American Statistical Association* 81: 945–961.
- Judea Pearl. 2017. “The Eight Pillars of Causal Wisdom,” An edited transcript of a lecture given at the West Coast Experiments, April 2017 video posted at <https://www.youtube.com/watch?v=8nHVUFqI0zk>
- Judea Pearl. 2009. *Causality: Models, Reasoning, and Inference*, 2d ed. Cambridge.
- Joshua D. Angrist and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics*. Princeton.
- 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.

11. outliers and rank statistics (Dec 12)

- 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.

12. latent variables and dimension reduction (Dec 12)

- 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.

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.