Quantitative Methodology in the Social Sciences Seminar
Political Science 236B

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Class: Tuesday 4–6
102 Barrows

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Description

This course is intended to be a seminar in which we discuss research designs which have succeeded. Few causal inferences in the social sciences are compelling. We carefully examine successful examples to see why they work. The seminar is also a forum for students to discuss the research designs and methods needed in their own work. It should be particularly helpful for students writing their prospectus or designing a major research project. The seminar will be supplemented by lectures to cover the statistical and computational material needed to understand the readings such as matching methods, instrumental variables, regression discontinuity, and Bayesian, maximum likelihood and robust estimation. Applications are drawn from a variety of fields including political science, statistics, economics, sociology, and public health.

Prerequisites

Prerequisites: Political Science 236A/Statistics 239A (The Statistics of Causal Inference in the Social Sciences) or equivalent. Experience with `R` is assumed.

Evaluation

The primary purpose of this class is to read and reflect on each set of readings (often work by other students) and for students to write a term paper. We do not assign a lot of pages, but students are expected to read what is assigned very carefully. Class discussion is absolutely essential to the success of a seminar, and active participation is an important component of your overall evaluation. The course evaluation is based on on class participation and discussion (25%), and a research paper (75%).

Optionally, students, may select the option that allows them to choose a project described below (25%), and a final paper which proposes a research design (50%). Of course, if students actually implement the proposed research design, that is wonderful, but not required.

The project involves choosing a target paper in one of several journals, and then writing an analysis of the target paper. The idea is to browse through several years of journals and to pick the best—clearest, most interesting, most convincing–paper. The paper must use data to make its point: this is a statistics course. You are looking for good papers. You are not looking for bad papers. Bad papers are easy to find. Good papers are hard to find. Your job will be to convince us that the paper is actually good.

It is recommended that students work on the project and the term paper jointly with one or at most two other students. Experience has shown that this greatly facilitates learning as well as increases the likelihood that the paper will eventually become a published article. Students may hand in a more polished version of their PS236A papers or papers they are working on for other classes.

Course Software and Books

The programming language for this course is the *R* variant of the *S* statistical programming language. It is available for download from: `http://www.r-project.org/`. *R* is open source software (released under the GNU public license) and is available at no charge. We will also be making extensive use of an R package called "Matching" (Sekhon 2011).

The following books on `R` may be of interest:

- Krause, Andreas and Melvin Olson. 2005. *The Basics of S-PLUS*. Springer. ISBN-10: 0387261095.
- Venables, W.N and Brian D. Ripley. 2003. *Modern Applied Statistics with S*. New York: Springer-Verlag. 4th edition. ISBN: 0387954570

Course outline

1.
   - D.A. Freedman. "On types of scientific enquiry." [Freedman's webpage].
   - D.A. Freedman. "Statistical Models and Shoe Leather," *Sociological Methodology*. 1991. Vol. 21, pp. 291-313

   If you want some more background, see

   - *The Ghost Map: The Story of London's Most Terrifying Epidemic–and How It Changed Science, Cities, and the Modern World* by Steven Johnson
   - Vinten-Johansen, P. Brody, H., Paneth, N., and Rachman, S. 2003. *Cholera, Chloroform, and the Science of Medicine.* New York: Oxford University Press.
   - On Farr's model of elevation and cholera see: Humphreys, N. A., ed. 1885. *Vital Statistics: A Memorial Volume of Selections from the Reports and Writings of William Farr.* London: Edward Stanford. Available on Google Scholar.

2. Regression-Discontinuity

   Eggers and Hainmueller: "The Value of Political Power: Estimating Returns to Office in Post-War British Politics"

   For background on Regression Discontinuity Design see:

   - Thistlethwaite and Campbell (1960): "Regression-Discontinuity Analysis: An alternative to the ex post facto experiment"
   - Gerber and Green (2009): "Testing the Accuracy of Regression Discontinuity Analysis Using Experimental Benchmarks"
   - Hahn, Todd, and van der Klaauw (2001): "Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design"

3. Experiments, RD, and Design

   Dunning and Nilekani (2011): "Ethnic Quotas and Political Mobilization: Caste, Parties, and Distribution in Indian Village Councils."

4. RD for Incumbency Advantage

   - The standard design: Gelman and King (1990): "Estimating Incumbency Advantage without Bias" *American Journal of Political Science*, 34:4, 1142–1164. 1990.
   - A new design: Lee (2008): "Randomized Experiments from Non-random Selection in U.S. House Elections"
   - Did the new design work? Caughey and Sekhon (2011): "Elections and the Regression-Discontinuity Design: Lessons from Close U.S. House Races, 1942–2008"

5. When Natural Experiments Are Neither Natural Nor Experiments

   - Ansolabehere, Snyder, and Stewart (2000): "Old Voters, New Voters, and the Personal Vote: Using Redistricting to Measure the Incumbency Advantage," *AJPS* 44:1, 17–34. 2000.
   - Sekhon and Titiunik (2012): "When Natural Experiments Are Neither Natural Nor Experiments"

6. Placebos: Computers, Pencils, and Controls

   - DiNardo and Pischke (1997): "The returns to computer use revisited: Have pencils changed the wage structure too?" *QJE* 112: 291–303.
   - Krueger (1993): "How computers have changed the wage structure: Evidence from microdata, 1984–1989." *QJE* 108: 33–60.

7. Education as a treatment: returns to Education

   - Angrist and Krueger (1991): "Does compulsory school attendance affect earnings?" *QJE* 1991; 106: 979–1019.
   - Imbens and Rosenbaum (2005): "Robust, accurate confidence intervals with a weak instrument: quarter of birth and education," *Journal of the Royal Statistical Society*, Series A, vol 168(1), 109–126.

- Bound, Jaeger, and Baker (1995): "Problems with Instrumental Variables Estimation when the Correlation Between the Instruments and the Endogenous Regressors is Weak," *JASA* 90, June 1995, 443–450.

8. Estimating media effects in the field

   - Lenz and Ladd: "Exploiting a Rare Shift in Communication Flows: Media Effects in the 1997 British Election"

9. Fixing Experiments?

   - Gerber, Alan S. and Donald P. Green. 2000. "The Effects of Canvassing, Telephone Calls, and Direct Mail on Voter Turnout: A Field Experiment." American Political Science Review 94(3): 653 663.
   - Imai, Kosuke. "Do Get-Out-The-Vote Calls Reduce Turnout? The Importance of Statistical Methods for Field Experiments." American Political Science Review
   - Green and Gerber Reply
   - Bowers, Jake and Ben Hansen. 2005. "Attributing Effects to A Cluster Randomized Get-Out-The-Vote Campaign."

10. Synthetic Cohorts

    - Abadie and Gardeazabal (2003): "The Economic Costs of Conflict: a Case-Control Study for the Basque Country"

11. Voting Irregularities

    - Wand, Shotts, Sekhon, Walter R. Mebane, Herron, and Brady (2001): The Butterfly Did It: The Aberrant Vote for Buchanan in Palm Beach County, Florida
    - Herron and Sekhon (2005): Black Candidates and Black Voters: Assessing the Impact of Candidate Race on Uncounted Vote Rates

    For additional examples see:

    - Mebane and Sekhon (2004): Robust Estimation and Outlier Detection for Overdispersed Multinomial Models of Count Data
    - Herron and Wand (2007): Assessing Partisan Bias in Voting Technology: The Case of the 2004 New Hampshire Recount
    - Sekhon (2004): The 2004 Florida Optical Voting Machine Controversy: A Causal Analysis Using Matching

References

Abadie, Alberto and Javier Gardeazabal. 2003. "The Economic Costs of Conflict: a Case-Control Study for the Basque Country." *American Economic Review* 92 (1).

Angrist, J and AB Krueger. 1991. "Does compulsory school attendance affect earnings?" *Quarterly Journal of Economics* 106: 979–1019.

Ansolabehere, Stephen, James M. Snyder, and Charles Stewart. 2000. "Old Voters, New Voters, and the Personal Vote: Using Redistricting to Measure the Incumbency Advantage." *American Journal of Political Science* 44 (1): 17–34.

Bound, J., D. Jaeger, and R. Baker. 1995. "Problems with Instrumental Variables Estimation when the Correlation Between the Instruments and the Endogenous Regressors is Weak." *Journal of the American Statistical Association* 90: 443–450.

Caughey, Devin and Jasjeet S. Sekhon. 2011. "Elections and the Regression-Discontinuity Design: Lessons from Close U.S. House Races, 1942–2008." *Political Analysis* 19 (4): 385–408.

DiNardo, JE and JS Pischke. 1997. "The returns to computer use revisited: Have pencils changed the wage structure too?" *Quarterly Journal of Economics* 112: 291–303.

Dunning, Thad and Janhavi Nilekani. 2011. "Ethnic Quotas and Political Mobilization: Caste, Parties, and Distribution in Indian Village Councils." `http://www.thaddunning.com/wp-content/uploads/2011/03/Dunning-and-Nilekani_March-2011.pdf`.

Eggers, Andy and Jens Hainmueller. 2009. "The Value of Political Power: Estimating Returns to Office in Post-War British Politics." *American Political Science Review* 103 (4): 513–533.

Gelman, Andrew and Gary King. 1990. "Estimating Incumbency Advantage without Bias." *American Journal of Political Science* 34 (4): 1142–1164.

Gerber, Alan S. and Donald P. Green. 2009. "Testing the Accuracy of Regression Discontinuity Analysis Using Experimental Benchmarks." *Political Analysis* 17: 400–417.

Hahn, Jinyong, Petra Todd, and Wilbert van der Klaauw. 2001. "Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design." *Econometrica* 69: 201–209.

Herron, Michael C. and Jasjeet S. Sekhon. 2005. "Black Candidates and Black Voters: Assessing the Impact of Candidate Race on Uncounted Vote Rates." *Journal of Politics* 67 (1): 154–177.

Herron, Michael C. and Jonathan Wand. 2007. "Assessing Partisan Bias in Voting Technology: The Case of the 2004 New Hampshire Recount." *Electoral Studies* 26 (2): 247–261.

Imbens, Guido W. and Paul Rosenbaum. 2005. "Robust, Accurate Confidence Intervals with a Weak Instrument: Quarter of Birth and Education." *Journal of the Royal Statistical Society, Series A* 168: 109–126.

Krueger, AB. 1993. "How computers have changed the wage structure: Evidence from microdata, 1984–1989." *Quarterly Journal of Economics* 108: 33–60.

Lee, David S. 2008. "Randomized Experiments from Non-Random Selection in U.S. House Elections." *Journal of Econometrics* 142 (2): 675–697.

Lenz, Gabriel S. and Jonathan McDonald Ladd. 2009. "Exploiting a Rare Shift in Communication Flows: Media Effects in the 1997 British Election." *American Journal of Political Science* 53 (2): 394–410.

Mebane, Walter R. Jr. and Jasjeet S. Sekhon. 2004. "Robust Estimation and Outlier Detection for Overdispersed Multinomial Models of Count Data." *American Journal of Political Science* 48 (2): 391–410.

Sekhon, Jasjeet S. 2004. "The 2004 Florida Optical Voting Machine Controversy: A Causal Analysis Using Matching." Working Paper.

Sekhon, Jasjeet S. 2011. "Matching: Multivariate and Propensity Score Matching with Automated Balance Search." *Journal of Statistical Software* 42 (7): 1–52. Computer program available at `http://sekhon.berkeley.edu/matching/`.

Sekhon, Jasjeet S. and Rocío Titiunik. 2012. "When Natural Experiments Are Neither Natural Nor Experiments." *American Political Science Review* 106 (1): 35–57.
URL `http://sekhon.berkeley.edu/papers/SekhonTitiunik.pdf`

Thistlethwaite, Donald L. and Donald T. Campbell. 1960. "Regression-Discontinuity Analysis: An alternative to the ex post facto experiment." *Journal of Educational Psychology* 51 (6): 309–317.

Wand, Jonathan N., Kenneth W. Shotts, Jasjeet S. Sekhon, Jr. Walter R. Mebane, Michael C. Herron, and Henry E. Brady. 2001. "The Butterfly Did It: The Aberrant Vote for Buchanan in Palm Beach County, Florida." *American Political Science Review* 95 (4): 793–810.