

Quantitative Methodology in the Social Sciences Seminar

Political Science 239

Professor Jasjeet Singh Sekhon
Rocio Titiunik, GSI

Class: 5-7pm Wed
205 Wheeler

Associate Professor Jasjeet Singh Sekhon

sekhon@berkeley.edu

[HTTP://sekhon.berkeley.edu](http://sekhon.berkeley.edu)

Office: Survey Research Center, 2638 Channing Way

Rocio Titiunik, GSI

rocio@are.berkeley.edu

[HTTP://are.berkeley.edu/rocio](http://are.berkeley.edu/rocio)

Office: Survey Research Center, 2638 Channing Way

Section:Th 5-7P, 200 Wheeler

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 form 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, economics, sociology and public health.

Prerequisites

Prerequisites: One of Political Science 236 (The Statistics of Causal Inference in the Social Sciences), Statistics 215 (Statistical Models) or equivalent. PS236 is recommended, and experience with R is assumed.

Evaluation

The primary purpose of this class is to read and reflect on each set of readings 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. There will also

be infrequent homework assignments. Students will be expected to briefly present their work in progress at the end of the course. Final grades will be based on class participation and discussion (25%), infrequent homework assignments (25%) and the final paper (50%).

It is recommended that students write 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 ps236 papers or papers they are working on for other classes.

Homework assignments are infrequent (about three during the semester). Assignments will mainly consist of replicating and expanding upon the results of a paper or published article. Although it is recommended that people work together in order to complete the assignments, students must hand in their own individual answers. Photocopies and other reproductions of someone else's answers are not acceptable. Students should hand in the answers to the problem sets, and all computer code written to find those answers.

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 forthcoming).

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*, Vol. 21, 1991 (1991), pp. 291-313

If you want some more indepth examples, 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. Gordon and Huber: "The Effect of Electoral Competitiveness on Incumbent Behavior"
 3. Beginning the example of 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 (forthcoming): “Randomized Experiments from Non-random Selection in U.S. House Elections”

For background on Regression Discontinuity Design see:

- Thistlethwaite and Campbell (1960): “Regression-Discontinuity Analysis: An alternative to the ex post facto experiment”
- Hahn, Todd, and van der Klaauw (2001): “Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design”

4. Another design for estimating incumbency advantage.

- 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 (2007): “Exploiting Tom DeLay: A New Method for Estimating Incumbency Advantage and the Effect of Candidate Ethnicity on Turnout”

5. Computers, Pencils and Controls as Opposed to Regression

- 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.

6. 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): “Randomization Inference with an Instrumental Variable,” *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.

7. Estimating media effects in the field

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

8. 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.”

9. Synthetic Cohorts

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

10. 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 (forthcoming): 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.
- 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.
- Gelman, Andrew and Gary King. 1990. “Estimating Incumbency Advantage without Bias.” *American Journal of Political Science* 34 (4): 1142–1164.
- Gordon, Sandy and Greg Huber. 2007. “The Effect of Electoral Competitiveness on Incumbent Behavior.” *Quarterly Journal of Political Science* 2 (2): 107–138.
- 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. forthcoming. “Assessing Partisan Bias in Voting Technology: The Case of the 2004 New Hampshire Recount.” *Electoral Studies*.
- Imbens, Guido W. and Paul Rosenbaum. 2005. “Randomization Inference with an Instrumental Variable.” *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. forthcoming. “Randomized Experiments from Non-random Selection in U.S. House Elections.” *Journal of Econometrics*.
- Lenz, Gabriel S. and Jonathan McDonald Ladd. 2006. “Exploiting a Rare Shift in Communication Flows: Media Effects in the 1997 British Election.” <http://sekhon.berkeley.edu/causalinf/papers/LaddLenzBritish.pdf>.
- 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. forthcoming. “Matching: Multivariate and Propensity Score Matching with Automated Balance Search.” *Journal of Statistical Software*. Computer program available at <http://sekhon.berkeley.edu/matching/>.
- Sekhon, Jasjeet S. and Rocío Titiunik. 2007. “Exploiting Tom DeLay: A New Method for Estimating Incumbency Advantage and the Effect of Candidate Ethnicity on Turnout.” Working Paper <http://sekhon.berkeley.edu/papers/SekhonTitiunik.pdf>.
- Thistlethwaite, D. and D. Campbell. 1960. “Regression-Discontinuity Analysis: An alternative to the ex post facto experiment.” *Journal of Educational Psychology* 51: 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.