

Quantitative Methodology in the Social Sciences Seminar
Political Science 236B
Statistics 239B

Professor Jasjeet Singh Sekhon
Yotam Shem-Tov, GSI

Class: Wed 4–7
791 Barrows Hall

Professor Jasjeet Singh Sekhon

`sekhon@berkeley.edu`

`HTTP://sekhon.berkeley.edu`

Office: 750C Barrows

Yotam Shem-Tov, GSI

`shemtov@berkeley.edu`

Section: Friday 10–12, 103 Moffitt

Description

This course is intended to be a seminar in which we discuss research designs which have at least in part 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, 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%), a research paper (50%), and a presentation of a paper in section (25%).

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 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.

Course outline

The readings for the first few weeks are as follows. The readings after that will be adapted to the interest of the students or borrowed from the Additional Topics section below.

1. GOTV experiments:

Gerber, Green, and Larimer (2008): Social pressure and vote turnout: Evidence from a large-scale field experiment. *APSR* 102: 1–33. [LINK]. Data available.

Background readings that are also required:

- Deaton (2009): “Instruments of Development: Randomization in the tropics, and the search for the elusive keys to economic development”. [LINK].
- Imbens (2010): “Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009)”. [LINK].

2. Hainmueller and Hangartner (2013): “Who gets a swiss passport? A natural experiment in immigrant discrimination.” *APSR*. [LINK].

3. Hainmueller and D. Hopkins. “The Hidden American Immigration Consensus: A Conjoint Analysis of Attitudes Toward Immigrants” *American Journal of Political Science* 2015. [LINK].

Background readings that are also required:

- Jens Hainmueller, D. Hopkins and T. Yamamoto. “Causal Inference in Conjoint Analysis: Understanding Multi-Dimensional Choices via Stated Preference Experiments”’ *Political Analysis*. 2014.
- Jens Hainmueller, T. Yamamoto and D. Hangartner. “Validating vignette and conjoint survey experiments against real-world behavior.” *Proceedings of the National Academy of Sciences* 2015.

4. RD and Mexico and the drug war:

- Dell (2011): “Trafficking networks and the Mexican drug war.” *American Economic Review* [LINK]. Data available.

5. Data science as manager: Teacher value added models.

- Chetty, Friedman, and Rockoff (2014a): “Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates”. [LINK]
- Rothstein (2010): “Teacher Quality in Educational Production: Tracking, Decay, and Student Achievement”. [LINK].
- Chetty, Friedman, and Rockoff (2014b): ‘ Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood’. [LINK]

Additional readings:

- Rothstein (Rothstein): “Revisiting the Impacts of Teachers”. [LINK].
- Chetty, Friedman, and Rockoff (Chetty et al.): “Measuring the Impacts of Teachers: Response to Rothstein (2014)” (note, the title should be Rothstein (2015)). [LINK].

6. Causal inference using judges design.

- Kling (2006): “Incarceration Length, Employment, and Earnings”. [LINK].
- Doyle (2007): “Child Protection and Child Outcomes: Measuring the Effects of Foster”. [LINK].

Additional reading:

- Maestas, Mullen, and Strand (2013) : “Does Disability Insurance Receipt Discourage Work? Using Examiner Assignment to Estimate Causal Effects of SSDI Receipt”. [LINK].
- Heckman and Vytlacil (2007a): “Chapter 70 Econometric Evaluation of Social Programs, Part I: Causal Models, Structural Models and Econometric Policy Evaluation”. [LINK]
- Heckman and Vytlacil (2007b): “Chapter 71 Econometric Evaluation of Social Programs, Part II: Using the Marginal Treatment Effect to Organize Alternative Econometric Estimators to Evaluate Social Programs, and to Forecast their Effects in New Environments”. [LINK]
- Abbring and Heckman (2007): “Chapter 72 Econometric Evaluation of Social Programs, Part III: Distributional Treatment Effects, Dynamic Treatment Effects, Dynamic Discrete Choice, and General Equilibrium Policy Evaluation”. [LINK]

7. Macro-Questions I

- Scheve and Stasavage (2012): “Democracy, War, and Wealth: Lessons from Two Centuries of Inheritance Taxation.” *APSR* 106: 82–102.

8. Macro-Questions 2

- The impact of genetics? Works or not?
 - Ashraf and Galor (2013b): “The ‘Out of Africa’ Hypothesis, Human Genetic Diversity, and Comparative Economic Development”. [LINK]
 - Ashraf and Galor (2013a) : “Genetic Diversity and the Origins of Cultural Fragmentation”. [LINK].

9. The line between description and causality

- King, Pan, and Roberts (2013): “How Censorship in China Allows Government Criticism but Silences Collective Expression.” *APSR* 107: 1–18. [LINK]

Additional Topics

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. Placebos: Computers, Pencils, and Controls
 - Krueger (1993): “How computers have changed the wage structure: Evidence from microdata, 1984–1989.” *QJE* 108: 33–60.
 - DiNardo and Pischke (1997): “The returns to computer use revisited: Have pencils changed the wage structure too?” *QJE* 112: 291–303.
 3. Estimating media effects in the field
 - Lenz and Ladd: “Exploiting a Rare Shift in Communication Flows: Media Effects in the 1997 British Election”
 4. 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.

5. 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”

6. Experiments, RD, and Design

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

7. 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”

8. 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”

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, A. and J. Gardeazabal (2003). The economic costs of conflict: a case-control study for the basque country. *American Economic Review* 92(1).
- Abbring, J. H. and J. J. Heckman (2007). Chapter 72 econometric evaluation of social programs, part iii: Distributional treatment effects, dynamic treatment effects, dynamic discrete choice, and general equilibrium policy evaluation. Volume 6, Part B of *Handbook of Econometrics*, pp. 5145 – 5303. Elsevier.
- Angrist, J. and A. Krueger (1991). Does compulsory school attendance affect earnings? *Quarterly Journal of Economics* 106, 979–1019.
- Ansolabehere, S., J. M. Snyder, and C. 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.
- Ashraf, Q. and O. Galor (2013a). Genetic diversity and the origins of cultural fragmentation. *American Economic Review* 103(3), 528–33.
- Ashraf, Q. and O. Galor (2013b). The 'out of africa' hypothesis, human genetic diversity, and comparative economic development. *American Economic Review* 103(1), 1–46.
- 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, D. and J. S. Sekhon (2011). Elections and the regression-discontinuity design: Lessons from close u.s. house races, 1942–2008. *Political Analysis* 19(4), 385–408.
- Chetty, R., J. N. Friedman, and J. E. Rockoff. Measuring the impacts of teachers: Response to rothstein (2014). .
- Chetty, R., J. N. Friedman, and J. E. Rockoff (2014a). Measuring the impacts of teachers i: Evaluating bias in teacher value-added estimates. *American Economic Review* 104(9), 2593–2632.
- Chetty, R., J. N. Friedman, and J. E. Rockoff (2014b). Measuring the impacts of teachers ii: Teacher value-added and student outcomes in adulthood. *American Economic Review* 104(9), 2633–79.
- Deaton, A. (2009). Instruments of development: Randomization in the tropics, and the search for the elusive keys to economic development. NBER Working Paper 14690.
- Dell, M. (2011). Trafficking networks and the mexican drug war. *Unpublished manuscript, MIT*.
- DiNardo, J. and J. Pischke (1997). The returns to computer use revisited: Have pencils changed the wage structure too? *Quarterly Journal of Economics* 112, 291–303.
- Doyle, J. (2007). Child protection and child outcomes: Measuring the effects of foster care. *American Economic Review* 97(5), 1583–1610.

- Dunning, T. and J. 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, A. and J. 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, A. and G. King (1990). Estimating incumbency advantage without bias. *American Journal of Political Science* 34(4), 1142–1164.
- Gerber, A. S. and D. P. Green (2009). Testing the accuracy of regression discontinuity analysis using experimental benchmarks. *Political Analysis* 17, 400–417.
- Gerber, A. S., D. P. Green, and C. W. Larimer (2008). Social pressure and vote turnout: Evidence from a large-scale field experiment. *American Political Science Review* 102(1), 33.
- Hahn, J., P. Todd, and W. van der Klaauw (2001). Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica* 69, 201–209.
- Hainmueller, J. and D. Hangartner (2013). Who gets a swiss passport? a natural experiment in immigrant discrimination. *American Political Science Review* 107(1), 159–187.
- Heckman, J. J. and E. J. Vytlačil (2007a). Chapter 70 econometric evaluation of social programs, part i: Causal models, structural models and econometric policy evaluation. Volume 6, Part B of *Handbook of Econometrics*, pp. 4779 – 4874. Elsevier.
- Heckman, J. J. and E. J. Vytlačil (2007b). Chapter 71 econometric evaluation of social programs, part ii: Using the marginal treatment effect to organize alternative econometric estimators to evaluate social programs, and to forecast their effects in new environments. Volume 6, Part B of *Handbook of Econometrics*, pp. 4875 – 5143. Elsevier.
- Herron, M. C. and J. 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, M. C. and J. Wand (2007). Assessing partisan bias in voting technology: The case of the 2004 new hampshire recount. *Electoral Studies* 26(2), 247–261.
- Imbens, G. W. (2010). Better late than nothing: Some comments on deaton (2009) and heckman and urzua (2009). *Journal of Economic Literature* 48(2), 399–423.
- Imbens, G. W. and P. 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.
- King, G., J. Pan, and M. E. Roberts (2013). How censorship in china allows government criticism but silences collective expression. *American Political Science Review* 107(02), 326–343.
- Kling, J. R. (2006). Incarceration length, employment, and earnings. *American Economic Review* 96(3), 863–876.
- Krueger, A. (1993). How computers have changed the wage structure: Evidence from microdata, 1984–1989. *Quarterly Journal of Economics* 108, 33–60.

- Lee, D. S. (2008, February). Randomized experiments from non-random selection in U.S. House elections. *Journal of Econometrics* 142(2), 675–697.
- Lenz, G. S. and J. M. 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.
- Maestas, N., K. J. Mullen, and A. Strand (2013). Does disability insurance receipt discourage work? using examiner assignment to estimate causal effects of ssdi receipt. *American Economic Review* 103(5), 1797–1829.
- Mebane, W. R. J. and J. S. Sekhon (2004). Robust estimation and outlier detection for overdispersed multinomial models of count data. *American Journal of Political Science* 48(2), 391–410.
- Rothstein, J. Revisiting the impacts of teachers. .
- Rothstein, J. (2010). Teacher quality in educational production: Tracking, decay, and student achievement. *The Quarterly Journal of Economics* 125(1), 175–214.
- Scheve, K. and D. Stasavage (2012). Democracy, war, and wealth: Lessons from two centuries of inheritance taxation. *American Political Science Review* 106(1), 82–102.
- Sekhon, J. S. (2004). The 2004 florida optical voting machine controversy: A causal analysis using matching. Working Paper.
- Sekhon, J. S. and R. Titiunik (2012). When natural experiments are neither natural nor experiments. *American Political Science Review* 106(1), 35–57.
- Thistlethwaite, D. L. and D. T. Campbell (1960). Regression-discontinuity analysis: An alternative to the ex post facto experiment. *Journal of Educational Psychology* 51(6), 309–317.
- Wand, J. N., K. W. Shotts, J. S. Sekhon, J. Walter R. Mebane, M. C. Herron, and H. 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.