

Syllabus

PSC 504- Causal Inference

Professor & Term Anderson Frey, Spring Semester 2019

Room & Time HARK 329, TR 1030-1200

Office & Hours HARK 320B, W 1000-1200

Email: anderson.frey@rochester.edu

Overview The goal of this course is to give students a comprehensive toolbox for reading and producing cutting-edge applied empirical research, with focus on the theory and practice behind causal inference in social sciences. We will cover methods such as experiments, differences-in-differences, instrumental variables, regression discontinuity, matching and others. Students will read applied papers from both political science and economics, and write review reports examining research designs, identification strategies, and causal claims. They will also produce research proposals that will be presented in class.

Computation I teach the course in R, which is an open-source computing language that is widely used, and easy to learn. The software can be downloaded for free from www.r-project.org. I also recommend downloading RStudio (www.rstudio.com), a very good (and free) user interface for R.

Grading

- Presentation of an unpublished article (15%)
- Homework assignments (35%)
- Final project (35%)
- Participation and presentation (15%)

Presentation of an Unpublished Article Students should find an unpublished empirical article that addresses a causal claim to present in class. The presentation should not only explain in detail the article's research design, but also present your assessment of the identification strategy.

Assignments The assignments consist of a mix of computer simulations, data analysis, and paper replications. All sufficiently attempted work will be graded on a (+,-) scale. Assignments should be typed on the computer. I strongly advise students to use LaTeX, as it has a much better handling of mathematical equations than the average word processor. Once during the course, students will present their homework results to the class.

Final Project Students are expected to write a short empirical paper that applies methods learned in this class

Preliminary Reading List

The Potential Outcome Model

- Angrist and Pischke: Chapter 1*
- Morgan and Winship: Chapter 1-2*
- Holland, P. W. 1986. *Statistics and Causal Inference*. Journal of the American Statistical Association, Vol. 81, No. 396: 945-960*
- Sekhon, J.S. 2004. *Quality Meets Quantity: Case Studies, Conditional Probability and Counterfactuals*. Perspectives on Politics, Vol. 2: 281-293
- Heckman, James J. and Hidehiko Ichimura and Jeffrey Smith and Petra Todd. 1996. *Sources of Selection Bias in Evaluating Social Programs: An Interpretation of Conventional Measures and Evidence on the Effectiveness of Matching as a Program Evaluation Method*. Proceedings of the National Academy of Sciences 93(23): 13416-13420
- Heckman, James and Justin L. Tobias and Edward Vytlacil. 2001. *Four parameters of interest in the evaluation of social programs*. Southern Economic Journal, Vol. 68, No. 2, pp. 210-223

Regression and Bias

- Angrist and Pischke: Chapter 3*
- Morgan and Winship: Chapter 8*
- Aronow, P. M. and Cyrus Samii. 2015. *Does Regression Produce Representative Estimates of Causal Effects?* American Journal of Political Science 60(1): 250-267.
- Samii, C. 2016. *Causal Empiricism in Quantitative Research*. The Journal of Politics, 78(3): 941-955

Randomized Experiments

- Angrist and Pischke: Chapter 2*
- Imbens and Rubin: Chapters 4-5*
- Imbens, Guido. 2010. *Better LATE than nothing: some comments on Deaton (2009) and Heckman and Urzua (2009)*. Journal of Economic Literature 48(2): 399-423*

- Anderson, M. L. 2008 *Multiple inference and gender differences in the effects of early intervention: A reeval-*

- Imbens, Guido. 2015.

- Abadie, Alberto and Alexis Diamond and Jens Hainmueller. 2009. *Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program*. Journal of the American Statistical Association

Examples

- Acemoglu, Daron and Simon Johnson and Amir Kermani and James Kwak and Todd Mitton. 2016. *The Value of Connections In Turbulent Times: Evidence from the United States*. Journal of Financial Economics 121(2): 368-391**
- Bohn, Sarah and Magnus Lofstrom and Steven Raphael. 2014. *Did the 2007 Legal Arizona Workers Act Reduce the State's Unauthorized Immigrant Population?* Review of Economics and Statistics 96(2): 258-269**

Differences-in-Differences

- Angrist and Pischke: Chapter 5.2-5.4*
-

Panel Data

- Angrist and Pischke: Chapter 5.1*
- Cameron and Trivedi: Chapter 21*
- Imbens and Wooldridge: Sections 1-4
- Kim, In Song and Kosuke Imai. *On the Use of Linear Fixed Effects Regression Estimators for Causal Inference* Working Paper.

Examples

- La Ferrara, Eliana and Albert Chong and Suzanne Duryea 2012

- Acemoglu, Daron and Simon Johnson and James A. Robinson. 2001. *The Colonial Origins of Comparative Development: An Empirical Investigation*. American Economic Review 91(5): 1369-1401.**
- Miguel, Edward and Shanker Satyanath and Ernest Sergenti. 2004. *Economic shocks and civil conflict: an instrumental variables approach*. J Polit. Econ. 112(4): 725-753**
- Angrist, Joshua D. 1990. *Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records*. American Economic Review 80(3): 313-336
- Angrist, Joshua D. and Alan B. Krueger. 2001. *Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments*. Journal of Economic Perspectives, 15(4): 69-85
- Rogall, Thorsten. 2014. *Mobilizing the Masses for Genocide*. Working Paper.

Regression Discontin

- Fujiwara, Thomas. 2015. *Voting Technology, Political Responsiveness, and Infant Health: Evidence from Brazil*. *Econometrica* 83(2): 423-464

Multivariate RDD

- Zajonc, Tristan. 2012. *Essays on Causal Inference for Public Policy*. PhD Dissertation. Harvard University. 45-92*
- Frey, Anderson. 2015. *Cash Transfers, Clientelism, and Political Enfranchisement: Evidence from Brazil*. Working Paper.**
- Dell, Melissa. 2010. *The Persistent Effects of Peru's Mining Mita*. *Econometrica* 78(6): 1863-1903**
- Titiunik, Rocio and Luke Keele. 2015. *Geographic Boundaries as Regression Discontinuities*

- Altonji, Joseph and Todd E. Elder and Christopher Taber. 2005. *Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools*. *Journal of Political Economy* 113: 151-184. **
- Rosenbaum, Paul R. 2009. *Application of Sensitivity Analysis in Matched Observational Studies*. *Journal of the American Statistical Association* 104 (488): 1398-1405.