

2014 Main Workshop on Research Design for Causal Inference

Detailed Workshop Schedule (Preliminary)

Dates and Location: Monday July 7 (9:00) – Friday July 11 (ending at 5:00), 2014, at Northwestern Law School, 375 East Chicago Ave., Chicago IL 60611. All sessions (except Friday afternoon) will be in the “Rubloff” building, in Room 150. The Rubloff building is the “new” law building, closest to Lake Michigan, Rubloff 150 is roughly midway between Chicago Ave. on the north side and Superior Ave on the south side.

Registration and meals: Breakfast will be available each morning from 8:30 in Rubloff 155. A registration table will be open on Monday beginning at 8:00. Lunch will be provided between the morning and afternoon sessions. Snacks and liquids (coffee, tea, sodas, juice, water) will be available throughout the day in Rubloff 155.

Conference url: www.law.northwestern.edu/faculty/conferences/causalinference/frequentist/

Access to Readings: see instructions below

Monday July 7, 2014: Introduction to Modern Methods for Causal Inference

Introduction to Workshop (9:00-9:30) (Bernie Black):

Overview of lessons to be learned during the workshop.

Main lectures: Justin McCrary (9:30-12:30; 1:45-3:45)

Overview of causal inference and the Rubin “potential outcomes” causal model. The “gold standard” of a randomized experiment. Treatment and control groups, and the core role of the assignment (to treatment) mechanism. Causal inference as a missing data problem, and imputation of missing potential outcomes.

Readings: Imbens and Rubin, *Causal Inference in Statistics and Social Sciences* (draft 2014), chapters 1-8 (chapter 2 is background and can be skipped).

Stata-based examples (3:45-4:45): basic-intermediate and intermediate-advanced sessions

Note: An optional “Introductory to Stata” session will be held over lunch (Mame Maloney)

Bernie’s comment: Mame is a PhD student at Kellogg, who is working with me on healthcare projects. She is way better at Stata than I am.

Monday reception: 5:30-6:30: In central outdoor courtyard (if weather permits, otherwise inside).

Tuesday July 8, 2014 (Justin McCrary) (9:00-12:00, 1:00-3:00)

Instrumental variable and regression discontinuity methods

Causal inference with instrumental variables (IV), including (i) the core, untestable need to satisfy the “only through” exclusion restriction; (ii) heterogeneous treatment effects; and (iii) intent-to-treat designs for randomized trials (or quasi-experiments) with noncompliance.

(Regression) discontinuity (RD) research designs: sharp and fuzzy designs; bandwidth choice; testing for covariate balance and manipulation of the threshold; discontinuities as substitutes for true randomization and sources of convincing instruments.

Readings:

Angrist, Joshua D. and Jorn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press. Chapters 2, 4.

Angrist, Joshua D., Guido W. Imbens, and Donald B. Rubin, 1996, Identification of Causal Effects Using Instrumental Variables, 91 *Journal of the American Statistical Association* 444-455, plus comments (through p. 472).

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

Imbens, Guido W., and Thomas Lemieux, 2008, Regression Discontinuity Designs: A Guide to Practice, 142 *Journal of Econometrics* 615-635.

Stata-based examples (3:30-4:30)

[reading to come]

Wednesday July 9, 2014 (Alberto Abadie) (9:00-12:00, 1:00-3:00)

Observational Studies: Selection on observables

Selection on observables and common support assumptions. Subclassification, matching, and regression estimators of average treatment effects. Propensity score methods: matching and weighting.

Readings:

Imbens and Rubin, *Causal Inference in Statistics and Social Sciences* (2014), chapters 12-22

Imbens, Guido W. (2004), "Nonparametric Estimation of Average Treatment Effects under Exogeneity: A Review," 86 *Review of Economics and Statistics* 4-29.

Rosenbaum, Paul R., and Donald B. Rubin (1983), "The Central Role of the Propensity Score in Observational Studies for Causal Effects," 70 *Biometrika* 41-55.

Rubin, Donald B. (1977), "Assignment to Treatment Group on the Basis of a Covariate,"
2 Journal of Educational Statistics 1-26.

Stata-based examples (3:30-4:30) {Bernie Black}

Reading: Bernard Black, Jose Espin-Sanchez, Eric French, and Kate Litvak, *The Effect of Health Insurance on Near-Elderly Health and Mortality* (working paper 2014) (<http://ssrn.com/abstract=2103669>)

Thursday, July 10, 2014 (Alberto Abadie) (9:00-noon)

Matching, Directed Acyclic Graphs (DAGs), Standard errors.

What to match on: a brief introduction to directed acyclic graphs (DAGs). Robust and clustered standard errors. The bootstrap.

Readings: DAGs:

*Morgan, Stephen and Christopher Winship (2d ed. forthcoming 2014), *Counterfactuals and Causal Inference: Methods and Principles for Social Research*, Cambridge University Press. Chapter 3.

Pearl, Judea (2009), *Causality* (second edition). Cambridge University Press.

Reading: Standard Errors

Angrist, Joshua, and Jorn-Steffen Pischke (2009), *Mostly Harmless Econometrics: An Empiricist's Companion* ch. 8.

Cameron, A. Colin, and Praveen Trivedi, (2010) *Microeconometrics Using Stata*. Chapter 13.

Thursday post-lunch talk (Bernie Black): Bloopers: How Smart People Get Causal Inference Wrong

Examples, drawn from different areas, of how to get causal inference wrong.

Thursday afternoon, July 10, 2014 (Jens Hainmueller): 1:45-4:45

Difference-in-Differences, Panel Data, and Synthetic Controls

Simple two-period DiD; the "parallel changes" assumption. Leads and lags and distributed lag models. Accommodating covariates. Triple differences.

Readings:

Angrist, Joshua D. and Jorn-Steffen Pischke (2009). *Mostly Harmless Econometrics: An Empiricist's Companion*, Chapter 5.

Card, David, and Alan B. Krueger (1994), Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania ,” 84 *American Economic Review* 772-793.

Wooldridge, JeffreyM. (2010). *Econometric analysis of cross section and panel data*. MIT press. Second edition, Chapter 10.

Autor, David H. (2003). Outsourcing at will: The contribution of unjust dismissal doctrine to the growth of employment outsourcing. 21 *Journal of Labor Economics* 1-42.

Friday morning, July 11, 2014 (Jens Hainmueller): 9:00-12:00

Panel data methods. Synthetic controls.

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller (2010), Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program . 105 *Journal of the American Statistical Association* 493-505.

Suggested additional readings:

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller (2014), Comparative Politics and the Synthetic Control Method. *American Journal of Political Science*. doi: 10.1111/ajps.12116

Abadie, Alberto, and Javier Gardeazabal (2003), “The Economic Costs of Conflict: A Case Study of the Basque Country”, 93 *American Economic Review* 113-132.

Friday noon, August 10 (Mat McCubbins) (12:00-12:30)

An overview of some topics we didn’t cover but would have, given more time.

Friday afternoon: Feedback on your own research (parallel sessions)

Attendees will have an opportunity to present their own research design questions from current work in breakout sessions. Goal: obtain feedback on research design; *not* present results from a complete paper. [We ask presenters to stay for the full session, and can’t promise an early slot for those who must leave early.] (15 min to present, 15 min discussion) Session leaders: Bernie Black, Jens Hainmueller, Mat McCubbins. Parallel sessions as needed to meet attendee demand.

Access to Readings

Most readings (other than books), along with many additional research articles, will be posted on the workshop website, at <https://share.northwestern.edu/team/law-ciw>.

You will need a Northwestern userid and password, which you hopefully already have; if not, email law-admins@law.northwestern.edu. Please use ads\yournetid as the user name [note that the “domain” should be “ads”].

The first time you access the site, you will hit a second login screen. This time use your username (*without* “ads\”) and password.

Once you are in, you will see various “collections”, such as “readings for all workshops” along the left hand side.

Instructions to move multiple files from Sharepoint to local computer:

- 1) Open the sharepoint page in internet explorer. Go to the folder containing the documents you want to download.
- 2) **Check the box** next to “Type” at the upper left corner of the documents display, as though you are “selecting all.”
- 3) By clicking this, a top ribbon box called “Library Tools” appears. **Click “Library.”**
- 4) To the middle-right of the “Library” ribbon, you see an area called “Connect and Explore.” Select **“Open with Explorer”**
- 5) A windows explorer window will pop up. It should be populated with all the documents from the sharepoint site.
- 6) You can move these files as you would anything else on your computer. For example, you can open a second explorer window and copy and paste to your computer.

Questions during the workshop: Please email Bernie Black (bblack@northwestern.edu)
Michael Cooper (causalinference@law.northwestern.edu).