

2014 Advanced Causal Inference Workshop

[please recirculate to others who might be interested]

Northwestern University and Duke University are holding two workshops on Research Design for Causal Inference this year. We invite you to attend either or both.

Main workshop: Monday – Friday, July 7-11, 2014 [at Northwestern]

Advanced workshop: Wednesday - Friday, August 13-15, 2014 [at Duke]

Both workshops will be taught by world-class causal inference researchers. See below for details. Registration for each is limited to 100 participants.

For information and to register: law.northwestern.edu/faculty/conferences/causalinference/

Bernie Black [Northwestern, Law School and Kellogg School of Management]

Mat McCubbins [Duke, Political Science and Law]

Advanced Workshop Overview: The advanced causal inference workshop seeks to provide an in-depth discussion of selected topics that are beyond what we can cover in the main workshop. Principal topics for 2014 include: Day 1: Choosing estimands (the science), and how choice of estimand affects research design. Principal stratification methods (a little known, but very powerful extension of the always taker/never-taker/complier/defier categories developed in “causal IV”); advanced matching methods; multiple imputation of missing potential outcomes. Day 2: Simulation studies; bootstrap methods; advanced topics in regression discontinuity design. Day 3: Causal inference with panel data. Topics will include handling treatment heterogeneity, handling time dynamics, synthetic controls, marginal structural models, and standard errors.

Target Audience. Our target audience for the advanced workshop is empirical researchers who are reasonably familiar with the basics of causal inference (from our main workshop or otherwise), and want to extend their knowledge. We will assume familiarity with the potential outcomes notation, randomization inference, difference-in-differences, regression discontinuity, panel data, and instrumental variable designs, but will not assume expertise in any of these areas.

Advanced Workshop Faculty

Donald B. Rubin (Harvard University, Department of Statistics)

Donald Rubin is John L. Loeb Professor of Statistics, Harvard University. His work on the “Rubin Causal Model” is central to modern understanding of when one can and cannot infer causation from regression. Principal research interests: statistical methods for causal inference; Bayesian statistics; analysis of incomplete data. Web page, with link to CV: www.stat.harvard.edu/faculty_page.php?page=rubin.html; Wikipedia: http://en.wikipedia.org/wiki/Donald_Rubin

Justin McCrary (University of California, Berkeley, Law School)

Justin McCrary is Professor of Law, University of California, Berkeley. Principal research interests: crime and urban problems, law and economics, corporations,

employment discrimination, and empirical legal studies. Web page with link to CV: <http://www.econ.berkeley.edu/~jmccrary/>.

Jonathan N. Katz (California Institute of Technology)

Jonathan Katz is Kay Sugahara Professor of Social Sciences and Statistics at Caltech. Co-editor: *Political Analysis*. Principal research interests: American politics, political methodology; formal political theory. Web page with link to CV: <http://jkatz.caltech.edu/>.

Advanced Workshop Outline

Wednesday August 13 (Don Rubin)

Choosing estimands (the science). Implications of choice of estimand for choice of method. Principal stratification. Flexible matching methods. Multiple imputation of missing potential outcomes. And whatever else Don thinks he should cover, in the allotted time.

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

On estimands: Rubin, Donald (2005), Causal Inference Using Potential Outcomes: Design, Modeling, Decisions, 100 *Journal of the American Statistical Association* 322-331.

On principal stratification:

Comment: Principal stratification was first used (although the term was developed later) for instrumental variable estimates of “local average treatment effects” for treatment with non-compliance. See Angrist, Joshua, Guido Imbens, and Donald Rubin (1996), 91 *Journal of the American Statistical Association* 444-455. The groups relevant for this “causal IV” analysis (always takers, never takers, compliers, and defiers) can be seen as principal strata. If you are not familiar with this use of principal stratification, Imbens and Rubin chs. 24-25 will be useful background.

Meulli, Fabrizia, and Donald Rubin (2003), Assumptions Allowing the Estimation of Direct Causal Effects, 112 *Journal of Econometrics* 79-87. [**Note:** we have not posted the long, complex paper by Peter Adams et al. that Meulli and Rubin are commenting on; you need to know only that they estimate something they call a “direct” causal effect of wealth on mortality by conditioning on health.]

Frumento, Paolo, Fabrizia Mealli, Barbara Pacini, and Donald Rubin (2012), Evaluating the Effect of Training on Wages in the Presence of Noncompliance, Nonemployment, and Missing Outcome Data, 107 *Journal of the American Statistical Association* 450-466.

On other topics: Rubin, Donald B. (2008), For Objective Causal Inference, Design Trumps Analysis, 2 *Annals of Applied Statistics* 808-840.

Thursday August 14 (Justin McCrary)

Conducting simulation studies. Inference and testing using the bootstrap, including adapting bootstrap methods to your research design. Choosing among balancing methods: Matching, reweighting, and regression adjustment. Topics in regression discontinuity design: nonparametric estimation; Local linear regression and density estimation; choosing bandwidth and assessing sensitivity to bandwidth choice.

Readings:

Simulation: Cameron and Trivedi, *Microeconometrics Using Stata*, Chapters 4 and 13

Bootstrap: Bruce Hansen, *Econometrics*, Chapters 10

Nonparametric Regression: Hansen, *Econometrics* Chapters 11, 12

Regression Discontinuity: David S. Lee and John E. DiNardo, "Program Evaluation and Research Designs"

Friday August 15 (Jonathan Katz)

Topics in causal inference with panel data, including time-series-cross-sectional (TSCS) data. Topics will include issues of unit heterogeneity, specification of dynamics, synthetic matching, and marginal structural models, and which standard errors to use.

Readings:

Lunch talk: Advice from a journal editor on what to do (and not do) (Jonathan Katz is the editor of *Political Methodology*).

Registration and Workshop Cost

Advanced workshop tuition is \$550 (\$350 for graduate students and post-docs), with an additional discount to \$200 for Northwestern or Duke-affiliated attendees. The workshop fees include all materials, temporary Stata13 license, breakfast, lunch, snacks, and an evening reception on the first day of each program. All amounts will increase by \$50 roughly two months before the workshop. See website for registration deadlines and cancellation policy.

We know the workshop is not cheap. We use the funds to pay our speakers and for meals and other expenses; we don't pay ourselves.

Workshop Organizers

Bernard Black (Northwestern University, Law and Kellogg School of Management)

Bernie Black is Nicholas J. Chabreja Professor at Northwestern University, with positions in the Law School and Kellogg School of Management. Principal research interests: law and finance, international corporate governance, health law and policy; empirical legal studies. Papers on SSRN: <http://ssrn.com/author=16042>.

Mathew McCubbins (Duke University)

Professor of Political Science and Law at Duke University, with positions in the Law School and the Political Science Department, and director of the Center for Law and Democracy. Principal research interests: democratic institutions, legislative organization; behavioral experiments, communication, learning and decisionmaking; statutory interpretation, administrative procedure, research design; network economics. Web page with link to CV: www.mccubbins.us. Papers on SSRN: <http://ssrn.com/author=17402>.

Questions about the workshop: Please email Bernie Black (bblack@northwestern.edu) or Mat McCubbins (mathew.mccubbins@duke.edu) for substantive questions or fee waiver requests, and Michael Cooper (causalinference@law.northwestern.edu) for logistics and registration.