

Causal Inference in Education Research
EDUC 820/PUBPOL 820
Professor Susan Dynarski
Winter 2010 Monday/Wednesday 10:00-11:30

Course Overview

This course explores the use of experiments and quasi-experiments in education research. We will examine papers that use advanced research methods such as instrumental variables, regression discontinuity, propensity score matching, natural experiments, differences-in-differences, and randomized trials.¹

The major work of the class will be a paper in which you replicate and extend an existing piece of education research. This class is ideal for PhD students early in their dissertation phase, as well as for advanced master's students who plan to work with empirical research in a professional setting.

Prerequisite

An introductory course in multiple regression analysis (e.g., EDUC 795 or PUBPOL 639).

Readings

You are expected to complete the assigned reading before class. These papers must be read closely in order to really understand what is going on. Read actively: circle what is unclear, highlight what you find most interesting, peruse the bibliography for useful sources, read the footnotes and tables especially closely. It is very useful to write a summary of the paper for your own files.

To guide this process of active and thoughtful reading, I will post questions about the articles. You can prepare your answers to these questions with a study group (I encourage this). You will *not* submit these answers. Rather, I will ask you these questions in class.

There is no course packet. Readings consist of:

- 1) Articles and working papers (all available online and I provide links, but if a link is broken please go hunting yourself)
- 2) *Mostly Harmless Econometrics* by Joshua Angrist and Jorn-Steffen Pischke (paperback version is available at online bookstores for \$25)
- 3) Draft manuscript of Richard Murnane and John Willett, *Method Matters: Improving Causal Inference in Educational Research* (provided on course website)

¹ Richard Murnane and John Willett teach a wonderful course on causal inference at the Harvard Graduate School of Education. They have generously shared their course materials, which I have drawn on in designing this course.

Course Requirements and Grading

1) Class Participation

15%

I will randomly choose students to answer the reading questions I distribute before class. The quality of your answers to these questions will determine your participation grade, along with the quality and quantity of your voluntary contributions to the class discussion.

2) Class Presentation (20 minutes, with slides)

15%

In March or April, you will present your research-in-progress to the class. Your slides should be posted to the course website by the day before your scheduled presentation. Co-authors should split the presentation so each gets a chance to speak.

3) Final Paper (20-25 pp)

70%

The major work of the class will be a paper in which you replicate and extend an existing article. I will provide a list of articles for which the underlying data is readily available. You can replicate an article that is not on this list, but it is up to you to obtain the necessary data. I encourage you to co-author with another student in the class; groups of up to three students are allowed to write a paper together. You will be graded on the components of writing the paper: progress reports, first draft and second draft.

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| a) Three Progress Reports and Meetings to Discuss Them | 30% |
| b) First Draft | 10% |
| c) Second Draft | 15% |
| d) Final Draft | 15% |

Deadlines

Mon, Feb 1	Memo on proposed replication project
Mon, Feb 22	Progress report
Mon, Mar 15	Progress report
Mon, Mar 29	First draft (comments back by Mon Apr 6)
Wed, April 15	Second Draft (comments back by Wed Apr 22)
Mon, April 26	Final Draft

Week 1: Introduction to Causal Inference

Monday, Jan 11

Murnane, Richard and John Willett (forthcoming). *Method Matters* (draft manuscript, CTools under Resources), Chapters 1-2.

Cook, Thomas (2001). "[Sciencephobia](#)." *Education Next* (Fall).

Barrow, Lisa and Cecilia Rouse (2005). "[Causality, Causality, Causality: The View of Education Inputs and Outputs from Economics](#)." Federal Reserve Bank of Chicago

Wednesday, Jan 13

Angrist & Pischke (2009). *Mostly Harmless Econometrics* Ch 1-2.

Paul W. Holland (1986). "[Statistics and Causal Inference](#)." *Journal of the American Statistical Association* 81:396 (Dec), pp. 945-960.

Angrist, Joshua (2004). "[American Education Research Changes Tack](#)." *Oxford Review of Economic Policy* 20:2, pp. 198-212.

Week 2: Randomized Trials on Class Size

Wednesday, Jan 20

Murnane, Richard and John Willett (forthcoming). *Method Matters* (draft manuscript, CTools under Resources), Chapters 3-5.

Krueger, Alan (1999). "[Experimental Estimates of Education Production Functions](#)." *Quarterly Journal of Economics* 114(2): 497-532.

Week 3: Experiments in Developing Countries: Tutors and Teachers

Monday, Jan 25

Duflo, Esther, Rachel Glennerster, and Michael Kremer (2007). "[Using Randomization in Development Economics Research: A Toolkit](#)," in T. Paul Schultz and John A. Strauss, Editors, *Handbook of Development Economics*, Elsevier, Volume 4, pp. 3895-3962.

Abdul Latif Jameel Poverty Action Lab, "[Making Schools Work for Marginalized Children: Evidence from an Inexpensive and Effective Program in India](#)." (very short and accessible, written for practitioners)

Banerjee, Abhijit V., Shawn Cole, Esther Duflo, Leigh Linden (2007). "[Remedying Education: Evidence from Two Randomized Experiments in India](#)" *Quarterly Journal of Economics* 122:3, 1235-1264 (focus on the Balsakhi intervention throughout the paper, and skip section VI)

Wednesday, Jan 27

Duflo, Esther and Rema Hanna (2005). "[Monitoring Works](#)." NBER Working Paper 11880.

Week 4: Experiments in Postsecondary and Secondary Education

Monday, Feb 1

Scrivener, Susan and Michael J. Weiss (2009). "[More Guidance, Better Results? Three-Year Effects of an Enhanced Student Services Program at Two Community Colleges](#)." MDRC.

Richburg-Hayes, Lashawn, Thomas Brock, Allen LeBlanc, Christina Paxson, Cecilia Rouse and Lisa Barrow (2009). "[Rewarding Persistence: Effects of a Performance-Based Scholarship Program for Low-Income Parents](#)." MDRC.

Wednesday, Feb 3

Kemple, James (2009). "[Career Academies: Long-Term Impacts on Labor Market Outcomes, Educational Attainment, and Transitions to Adulthood](#)." MDRC.

Stem, David, Dayton, Charles, Paik, IL-Woo, Weisberg, Alan (1989). "[Benefits and Costs of Dropout Prevention in a High School Program Combining Academic and Vocational Education: Third-Year Results from Replications of the California Peninsula Academies](#)." *Educational Evaluation and Policy Analysis* 11: 405-416.

Week 5: Instrumental Variables

Monday, Feb 8

Chapter 10 of Murnane and Willett draft manuscript (73 pages! lots of statistical exegesis! Budget lots of time for this!).

Dee, Thomas S. (2004). "[Are There Civic Returns to Education?](#)" *Journal of Public Economics* 88:9-10, pp. 1697-1720.

Wednesday, Feb 10

Angrist & Pischke (2009). *Mostly Harmless Econometrics* Ch 4, through 4.1.2.

Angrist, Joshua and Krueger, Alan (1991). "[Does Compulsory School Attendance Affect Schooling and Earnings?](#)" *Quarterly Journal of Economics* 106:4, pp. 979-1014.

Week 6: Lotteries as Instruments

Monday, Feb 15

Abdulkadiroglu, Atila, Josh Angrist, Susan Dynarski, Jon Fullerton, Thomas Kane, and Parag Pathak (2009). "[Accountability and Flexibility in Public Schools: Evidence from Boston's Charters and Pilots.](#)" NBER Working Paper.

Dobbie, W. and Fryer, R. (2009). "[Are High Quality Schools Enough to Close the Achievement Gap? Evidence from a Social Experiment in Harlem.](#)" NBER Working Paper 15473.

Wednesday, Feb 17

Deming, David (2010). "[Better Schools, Less Crime?](#)" Harvard University Working Paper.

Week 7: Regression Discontinuity

Monday, Feb 22

Chapter 9 of Murnane and Willett

Angrist, Joshua and Victor Lavy (1999). "[Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement](#)." *Quarterly Journal of Economics* 114:2 (May), 533-602.

Wednesday, Feb 24

Angrist & Pischke (2008). *Mostly Harmless Econometrics* Ch 6.

Ludwig, Jens and Douglas Miller (2007). "[Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design](#)." *Quarterly Journal of Economics* 122:1, 159-208

Week 8: Vacation!

Week 9: Differences-in-Differences

Monday, March 8

Chapter 8 of Murnane and Willett

Dynarski, Susan (2003). "[Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion](#)." *American Economic Review* (March).

Wednesday, March 10

Seftor, Neil and Turner, Sarah (2002). "[Back to School: Federal Student Aid Policy and Adult College Enrollment](#)." *Journal of Human Resources* 37:2, 336-352.

Week 10: Fixed Effects as an Identification Strategy

Monday, March 15

Angrist & Pischke (2009). *Mostly Harmless Econometrics* Ch 5 through 5.3

Dynarski, Susan (2008). "[Building the Stock of College-Educated Labor](#)." *Journal of Human Resources* (Summer).

Wednesday, March 17

Currie, Janet and Enrico Moretti (2003). "[Mother's Education and the Intergenerational Transmission of Human Capital](#)." *Quarterly Journal of Economics* 118:4.

Deming, David (2009). "[Early Childhood Intervention and Life-Cycle Skill Development Evidence from Head Start](#)." *American Economic Journal: Applied Economics*.

Week 11: Propensity Scores and Matching [still under construction]

Monday, March 22

Chapter 12 of Murnane and Willett

Agodini, Roberto and Mark Dynarski (2004). "[Are Experiments the Only Option? A Look at Dropout Prevention Programs](#)." *Review of Economics and Statistics* 86:1, 180-194.

Wednesday, March 29

Week 12: Additional Topics (March 29 & 31)

Week 13: Practice Presentations (April 5 & 7)

This week you will do the first run of your 20-min presentation. Each team will be assigned a slot for their presentation. Nate Schwartz and other alumni of EDUC 820 will be your audience. They will provide coaching and feedback.

Week 14/15: Presentations and Additional Topics (April 12, 14 & 19)

This week you will do the final run of your 20-min presentation. Each team will be assigned a slot for their presentation. The class and Dynarski will be your audience.