

**Causal Inference in Education Research**  
EDUC 820/PUBPOL 820  
Fall 2011 - Professor Susan Dynarski  
Monday/Wednesday 10:00-11:30 – School of Education Building, Room 2334

**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.<sup>1</sup>

Other than the readings, the major work of the class is 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.

**Prerequisites**

An introductory course in multiple regression analysis (e.g., EDUC 795, EDUC 794 or PUBPOL 639). The course assumes mastery of regression analysis and exposure to fixed effects, instrumental variables, and limited dependent variables. For those whose previous exposure to experimental and quasi-experimental methods is limited, we provide a section to deepen understanding of the methods. The time and location of this lab is to be determined.

**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 (available online for \$22)
- 3) Richard Murnane and John Willett, *Method Matters: Improving Causal Inference in Educational Research* (available online for \$44)

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<sup>1</sup> 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** **20%**  
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 November or December, 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)** **65%**  
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.
- a) Three Progress Reports and Meetings to Discuss Them 25%
  - b) First Draft 10%
  - c) Second Draft 15%
  - d) Final Draft 15%

### Due Dates

Wed, Sept 28	Progress report (memo on proposed replication project)
Wed, Oct 26	Progress report
Wed, Nov 9	Progress report
Mon, Nov 21	First draft (comments back by Weds Nov 30)
Wed, Dec 7	Second Draft (comments back by Weds Dec 14)
Mon, Dec 19	Final Draft

## Topic 1: Introduction to Causal Inference

*Monday, Sept 12*

Murnane, Richard and John Willett (2011). *Method Matters*, 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, Sept 14*

Angrist & Pischke (2009). *Mostly Harmless Econometrics*, Chapters 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.

## Topic 2: Randomized Trials on Class Size

*Monday, Sept 19*

Murnane, Richard and John Willett (2011). *Method Matters*, Chapters 3-5.

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

### Topic 3: Experiments in Developing Countries: Tutors and Teachers

Wednesday, Sept 21

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)

Monday, Sept 26

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

### Topic 4: Experiments in Postsecondary and Secondary Education

Wednesday, Sept 28

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.

Monday, Oct 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.

## Topic 5: Instrumental Variables

Wednesday, Oct 5

Murnane, Richard and John Willett (2011). *Methods Matter*. Chapter 10. (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.

Monday, Oct 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.

## Topic 6: Lotteries as Instruments

Wednesday, Oct 12

Abdulkadiroglu, Atila, Josh Angrist, Susan Dynarski, Thomas Kane, and Parag Pathak (2011). "[Accountability and Flexibility in Public Schools: Evidence from Boston's Charters and Pilots.](#)" *Quarterly Journal of Economics*, 126(2). pp. 699-748.

Dobbie, Will & Roland G. Fryer (2011). "[Are High-Quality Schools Enough to Increase Achievement among the Poor? Evidence from the Harlem Children's Zone](#)". *American Economic Journal: Applied Economics*, 3(3).

Monday, Oct 17 – No class, October break

Wednesday, Oct 19

Deming, David (forthcoming). "[Better Schools, Less Crime?](#)" *Quarterly Journal of Economics*.

## Topic 7: Regression Discontinuity

*Monday, Oct 24*

Murnane, Richard and John Willett (2011). *Methods Matter*. Chapter 9.

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, Oct 26*

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

## Topic 8: Differences-in-Differences

*Monday, Oct 31*

Murnane, Richard and John Willett (2011). *Methods Matter*. Chapter 8.

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

*Wednesday, Nov 2*

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.

### **Topic 9: Fixed Effects as an Identification Strategy**

*Monday, Nov 7*

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, Nov 9*

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*.

### **Topic 10: Propensity Scores and Matching [under construction]**

*Monday, Nov 14*

Murnane, Richard and John Willett. (2011). *Methods Matter*. Chapter 12.

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, Nov 16: David Figlio*

Figlio, David, Mark Rush and Lu Yin (2011). "Is it Live or is it Internet? Experimental Estimates of the Effects of Online Instruction on Student Learning." *Journal of Labor Economics*.

### **Topic 11: Additional Topics (November 21): Brian Jacob**

### **Topic 12: Practice Presentations (November 28 & 30)**

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

### **Topics 13/14: Presentations and Additional Topics (December 5, 7, and 12)**

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.