Causal Inference in Education Research
EDUC 747-001 / PUBPOL 750-003
Professor Susan Dynarski
Winter 2009 Wednesday 9:00-12:00

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.

Students will produce a substantial, original piece of research. Research options include testing an original hypothesis using data; replicating and extending an existing empirical paper; critically reviewing the existing research on a topic; and formulating a detailed research design. 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.

This syllabus will be updated as the course progresses. The version on CTools is authoritative.

Prerequisite

An introductory course in multiple regression analysis (e.g., EDUC 795 or PUBPOL 569).

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)

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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 25%
I will cold call from the lists of reading questions I distribute before class. Names will be chosen randomly. 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.

2) Final Paper 60%
Your paper (20-25 pp) will be a substantial, original piece of quantitative research in education. For doctoral students, the goal is a publishable article. I encourage you to co-author with another student in the class. Research options include testing an original hypothesis using data; replicating and extending an existing empirical paper; critically reviewing the existing research on a topic; and formulating a detailed research design. In each case, the paper should reflect a through grasp of the course’s technical concepts.

You must meet all of these deadlines to get full credit for the paper. You are graded on the quality of the research at each step of the process, including the final draft.

<table>
<thead>
<tr>
<th>Date</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>January 16</td>
<td>Submit: One-page paper prospectus</td>
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<tr>
<td>January</td>
<td>Meet with Dynarski to discuss prospectus</td>
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<td>January 31</td>
<td>Submit: Three-page expanded prospectus</td>
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<td>February</td>
<td>Meet with Dynarski to set goals</td>
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<td>February 15</td>
<td>Submit: Annotated bibliography</td>
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<td>February 28</td>
<td>Submit: Detailed outline, including blank tables</td>
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<td>March 15</td>
<td>Submit: First draft</td>
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<td>March</td>
<td>Meet with Dynarski to get feedback on draft</td>
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<tr>
<td>March - April</td>
<td>Oral presentation of research to class</td>
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<tr>
<td>April 15</td>
<td>Submit: Second draft</td>
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<td>April 26</td>
<td>Submit: Final draft</td>
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January 7, 2009: Introduction

Required Readings to be Discussed in Class


Lecture: Introduction to methodological issues in classical experimental research design, in preparation for the discussion in the following class. Observational design vs. experimental design. Getting ready to read the class size papers.

January 14: Class Size: Randomized Trial and Observational Analyses

Required Readings to be Discussed in Class


Lecture: Issues in analysis and design of experiments: intention to treat vs. effect of treatment on the treated; attrition. Getting ready to read the voucher papers.
January 21: Issues in the Design and Analysis of Randomized Trials

**Required Readings to be Discussed in Class**

Chapter 4 of Murnane and Willett draft manuscript (CTools under Resources)


*Lecture*: Introduction to natural experiments. Getting ready to read the school lottery papers.

January 28: School Lotteries as Natural Experiments

**Required Readings to be Discussed in Class**

Chapter 6 of Murnane and Willett draft manuscript (CTools under Resources)


February 4: Natural Experiments Using Differences-in-Differences & Fixed Effects

**Required Readings to be Discussed in Class**


February 11: Regression Discontinuity

*Required Readings to be Discussed in Class*


Chapter 7 of Murnane and Willett


February 18: Regression Discontinuity & IV

*Required Readings to be Discussed in Class*


March 4 & 11: Fixed Effects & IV

*Required Readings to be Discussed in Class*

Angrist & Pischke (2008). *Mostly Harmless Econometrics* Ch 4 -skip 4.2 & 4.3 & starred subsections & skim proofs


*Guest Speaker March 11:*

David Deming, Harvard University

*Two Student Presentations*
March 18 & 25
Assessing the Effectiveness of Teacher Certification:
Randomized Trials and Observational Analysis

Required Readings to be Discussed in Class


Two Student Presentations per Class

April 1: Evaluations in Developing Countries

Required Readings to be Discussed in Class


Two Student Presentations

April 8: Assessing Accountability Regimes using Cross- and Within-State Policy Variation

Required Readings to be Discussed in Class


Two Student Presentations
April 15: Financial Aid

Required Readings to be Discussed in Class


Two Student Presentations

April 22: Student Presentations, Wrap-up & Lunch at Dominick’s!