

Policy Analysis and Program Evaluation for Education*
EDUC 2360, Fall 2020

(Last updated 8/17/2020)

Logistics

Lectures: Tues & Thurs, 4:00 to 5:20 pm

Instructor: Matthew Kraft
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Office Hours: Group drop-in office hours: Wednesdays 4:00 to 5:00 pm
* No appointment needed
Individual office hours: Mondays 4:00 to 5:00 pm*
** Please sign up using the following link

Note: I very much enjoy meeting with students. Don't feel as if you have to have a specific question. Office hours are your time to discuss any topics, course related or otherwise. I strive to make my office hours a safe place for students of all backgrounds. I am happy to meet with you at other times if these times don't work.

Website: **XXXXX**
Please check the course website frequently for important announcements, readings and assignments.

Description and Objectives

In order for policymakers to make sound decisions about which programs or policies to adopt, they must have a strong understanding of how these interventions will affect students, teachers, and schools. For a variety of reasons, though, measuring the *causal effects* of interventions on educational outcomes remains a difficult challenge. Fortunately, ongoing advances in data collection and research methods provide unprecedented opportunities to develop the type of knowledge that can improve policy and practice in urban education.

This course provides an overview of methods that enable researchers to answer such questions, focusing on those approaches that provide accurate information about the *causal effects* of interventions on educational outcomes. The course has four main goals:

1. Help students recognize the importance of high-quality quantitative evaluation research and to identify the ways in which studies exceed or fall short of this standard.
2. Help students understand the key insights and intuition behind a range of data-analytic methods to make them critical consumers of program evaluation research.

*Note: I am grateful to John Papay who developed this course/syllabus and to Dick Murnane, John Willett and Josh Angrist who taught causal inference to me.

3. Help students develop a tool-kit of methods – including increased familiarity with STATA – so they can design and carry out their own quantitative research.
4. Expose students to high-quality quantitative research on important education policy questions.

Shared Norms for a Virtual Class During a Pandemic

These are challenging times for us all. I commit to understand and support you if you need to prioritize your own/a family member's physical, mental, or emotional health. I ask that you be flexible and prepared for potential changes to the class throughout the semester given the uncertainty of the moment.

Teaching in an online format also creates its own set of challenges for developing class rapport and a culture of openness and understanding. Things can feel even more high-stakes on video. Please know that I understand when things come up during class. I welcome kids and pets dropping in to say hi. More than anything, I hope that we can develop a space where we all feel comfortable contributing, sharing our ideas and points of confusion, and grappling with not only the methods of the papers we read but also the topics as they relate to educational opportunity, race, class, justice, and inequality. The best way to master this material is through a process of “productive foundering,” one where we make mistakes, are confused, but embrace this as part of the learning process.

Course Overview

In course meetings, we will examine a range of approaches, including randomized controlled trials, differences-in-differences techniques, regression-discontinuity designs, propensity score matching, and instrumental variables methods. We will also read and discuss papers that use advanced research methods to draw causal conclusions about a range of education policy questions. Discussions will focus largely on the methodological issues raised in the papers, although we will explore briefly the substantive implications. Class assignments will require students to demonstrate understanding of the course's key concepts and an ability to apply their knowledge to analyze data.

Prerequisites

This course is designed primarily for students in the Urban Education Policy master's program and builds on the material covered in EDUC2320. It is also open, at the professor's discretion, to other students who have completed an approved course in introductory statistics and would like an advanced course in education policy analysis. **Students are expected to arrive in class with a solid understanding of how to conduct Ordinary Least Squares (OLS) regression (including multiple regression) and how to interpret the results.** We will review very briefly inferential statistics and regression analysis, but this review will not be sufficient for students who do not already have a strong background in these areas. **A basic familiarity with the statistical software package STATA is strongly recommended.**

Course Structure and Readings

I firmly believe that the best way to learn this material is through multiple and different exposures to the content and through application. As a result, for each topic (with minor exception), we will:

- (a) read a textbook description of the method,
- (b) examine the methods together in class,
- (c) read an article that applies the method,
- (d) discuss the article in class,
- (e) do a practice problem set that requires you to use the method,
- (f) (for most topics), complete a problem set that requires you to use the method

I believe that each of these steps is critical to your learning in the course, although some of these (e.g., practice problem sets) are optional.

As a result of this sequence, during most Tuesday class meetings we will critically examine a research article and discuss the specific method or approach the article uses. During most Thursday classes, I will introduce a new topic or method that will form the basis for the following week's readings.

Thus, class readings fall into two categories. First, for Tuesdays each week we will read and discuss a scholarly paper (or two) in which researchers apply the method we are discussing. There may be parts of these papers that you do not fully understand and the authors may extend their approaches in ways that we have not discussed. Don't worry about these sections, but try to read the paper as an informed consumer. For each reading, I will develop a set of questions. **You should read the article VERY carefully and develop responses to these questions before you come to class.**

The second set of readings for most Thursdays each week includes more technical presentations of a method, explaining how it is used. We will discuss this method (which will form the basis for the following week's article) at the end of class. You should read these materials before class to help you understand and engage in the lecture. Then, I would recommend returning to the readings for more detail after class. Most of these readings will come from the book *Methods Matter* by Richard Murnane and John Willett.

Required Texts/Course Materials

This course will draw heavily on *Methods Matter* by Richard Murnane and John Willett. It is the only required text for the course. The book is available on-line or at the Brown University Bookstore. We will start using the book at the beginning of the semester.

Murnane, R.J. & Willett, J.B. (2011). *Methods Matter: Improving Causal Inference in Educational and Social Science Research*. New York: Oxford University Press.

Because this course builds on your understanding of regression analysis, you may want to have access to a book that provides an introduction to quantitative research (such as the texts that were used or recommended in your introductory course). In addition, some students might find it useful to supplement their reading in *Methods Matter* with other texts. Many authors from a

variety of disciplines have written books on program evaluation. Each takes a somewhat different approach and writes in a slightly different way. You should find a book that examines these subjects in a manner that makes sense to you. You should feel no obligation to purchase these books, but you might want to browse through them to see if they treat the material in a helpful way for you. Several of these books go into more detail than *Methods Matter*. They should all be available on reserve at Rockefeller Library.

Experimental and Quasi-Experimental Designs for Generalized Causal Inference by William Shadish, Thomas Cook, and Donald Campbell (Psychologists/ General Social Scientists)

Mostly Harmless Econometrics: An Empiricist's Companion by Joshua Angrist and Jorn-Steffen Pischke (Economists)

Causal Inference for Statistics, Social, and Biomedical Sciences by Guido Imbens & Donald Rubin (Economist/Statistician)

Counterfactuals and Causal Inference: Methods and Principles for Social Research by Stephen Morgan and Christopher Winship (Sociologists)

Introduction to Econometrics, James Stock and Mark Watson (Economists)

All other class readings will be available on the course website in Canvas or through links in the reading list below.

Statistical Software

One of the goals of the class is to improve your skills with a statistical software package. While Excel or other spreadsheet programs can do some analysis, for more sophisticated work you will need to use a program like STATA, SASS, SPSS, R, etc.

This year, we will be using STATA. You can download the software from Brown at: <https://www.brown.edu/information-technology/software/catalog/stata-se-1>

You might find the following book a useful resource in learning STATA. It is also on reserve:

- Alan C. Acock. (2012). *A Gentle Introduction to STATA*, Revised 3rd Edition. Stata Press.

If you would like additional information about how to manage your work in Stata, I have found the following book particularly helpful. It will also be on reserve:

- J. Scott Long. (2009). *The Workflow of Data Analysis Using Stata*. Stata Press.

Finally, the Murnane and Willett book comes with a companion website that includes data sets and STATA code: <https://stats.idre.ucla.edu/other/examples/methods-matter/>

You are welcome to use a different statistical package if you prefer, but we cannot provide support.

Course Requirements and Expectations

Attendance/ Participation

The success of this class depends on the thoughtful, engaged participation of all class members. As a result, **class attendance is expected weekly**. Please notify me in advance if you will need to miss class.

Effective class participation is a matter of quality, not quantity. It requires that you come to class well-prepared to discuss all of the assigned readings and that you actively engage in class by posing questions and contributing to small- and large-group discussions. Asking clarifying questions and addressing points of confusion are highly encouraged.

You are **not** expected to be perfect; you **are** expected to try. One of the central skills I hope you learn from the class is how to talk about statistical concepts. In many ways, this is like learning a foreign language. This class will be a safe space to practice your understanding (rather than practicing for the first time in front of your boss).

Problem Sets

There will be 3 problem sets over the course of the semester. These assignments are designed to help you solidify your understanding of the key content and to give you practice in applying the approaches we have discussed. Each problem set will guide you through a real analysis of a dataset. You will need to conduct the required analyses in STATA, interpret your findings, and write up your results. **You may choose to complete this work on your own or with a partner.** Each team should turn in one assignment. **You may only discuss your work with your partner.**

Memos

You will also be required to write 2 brief memos. These assignments are designed to allow you to think synthetically across your learning in the course and to give you more practice in communicating your ideas to an audience of policymakers/practitioners who are not trained in data analysis. **You will complete these memos independently and may not discuss the content with any of your classmates.**

Final Paper

The final paper is more open-ended. There are four main options, each designed to allow you to complete an analysis that interests you. You may choose an option that can help further your own goals, and you may find it useful to tie in this paper to your internship.

- **Option 1: Replication Study:** Take an existing quantitative study of an education policy issue and replicate the analysis. You may use a paper that we have read in the course or another paper of interest published in a peer-reviewed journal. Replicating an existing paper will help you to gain familiarity with a dataset and to hone your data-analytic skills.

- Option 2: Critical Policy Analysis: Write a critical summary of the research literature on a policy or program of interest. Your paper should review the available evaluations of this program or policy, describe the evaluation approaches used, and assess the strengths and weaknesses of these studies. You should explain what the weight of the research evidence is for policymakers, including a discussion of what implications are and are not warranted. You should conclude with a discussion of how the limitations of these studies could be addressed in future research to help inform policymakers.
- Option 3: Original study: Conduct a small-scale evaluation of an existing program or policy. Here, you could leverage your connections with your internship to identify a program of interest and find appropriate data for an evaluation. Your analysis should be framed causally, although you need not use one of the techniques we discussed in the class. NOTE: Conducting a high-quality evaluation in a single semester (while learning the methods) will be challenging. In particular, identifying and negotiating access to the appropriate data may be difficult. If you are interested in pursuing this option, I recommend that you start this process early.
- Option 4: Evaluation design proposal: Write a proposal for a *feasible* evaluation of a program or policy of interest. Again, you could leverage your connections with your internship. Your paper will describe the design of an evaluation that would answer a causal question of interest about the program. Please note: the proposal should be rooted in reality (i.e., only propose a study that could be carried out reasonably).

The final paper should be approximately 15 pages in length (double-spaced, excluding any tables and figures). **You will complete these projects independently but may consult with your peers at any time about your ideas or early drafts.** More details on this assignment will be distributed in a few weeks. Regardless of which option you choose, you should follow the timeline below:

Course Grades

Course grades will be based on written assignments and class participation, using the following approximate percentages:

Attendance, class participation, and preparedness:	20%
Problem sets:	30%
Memos:	20%
Final paper:	30%

** Please note that the average percentages of points earned on assignments do not necessarily map onto standard letter grades. I determine the cutoff points for final grades based on multiple criteria at the end of course. In order to be equitable to all students I do not offer make-up assignments or extra credit opportunities.

** *All assignments should be turned in via the course website. Assignments emailed to me will not be accepted.*

Late Policy:

I have two primary goals with my late policy – providing the type of expectations and flexibility typical of a workplace setting, and minimizing email traffic.

Don't hesitate to ask for an extension if you need it. The key is planning in advance and good communication. Requests for extensions due to extenuating circumstances (very broadly defined) must be submitted at least 24 hours before the assignment is due.

Assignments turned in late without prior approval will lose 5% of the total possible points each day the assignment is late (e.g. a paper turned in >0 but ≤ 24 hours late will lose 5% of the total possible points, a paper turned in >24 but ≤ 48 hours late will lose 10% of the total possible points). Sometimes turning in an assignment late is a better choice than turning it in on-time.

Course Time Allotment

The total of in-class hours and out-of-class work for all full-credit courses at Brown is approximately 180 hours over the semester. In this course, students can expect to spend 2.5 hours per week in class (32.5 hours total). Required reading and preparation for the class meetings is expected to take up approximately 7 hours per week (84 hours). In addition, students will complete three problem sets, each of which should take approximately 10 hours (30 hours), and a final paper (approximately 35 hours). Actual times will vary for each student; final grades are not determined by the amount of time a student spends on the course.

Academic Code

All students should read, understand and abide by the [Academic Conduct Code](#) at Brown. In particular, please pay close attention to the section on “use of sources” (p. 6) to be sure to appropriately credit outside sources and avoid any potential issue of plagiarism.

Additional Support

I am committed to providing you with the resources necessary to meet your objectives in this class. I will hold regular office hours and am available to meet outside of those times as well. In addition, I will post practice problem sets.

Practice Problem Sets

For most every week, we will post a practice problem set. These problem sets will be grounded in a real dataset and will walk you through an analysis related to the topics covered in class. You will need to think through your models and then fit them in STATA.

Study Groups

I strongly encourage you to form study groups. Collaborative learning is an important component of this class, and you will get more out of the class if you engage with your peers outside of class time. You will also find that you come to class better prepared to share ideas and engage in discussion. **However, you should not discuss your work on the problem sets other than as described above.** Study groups are not required, but should you form one, I suggest that you include members with experiences, abilities, and career plans different from your own. Effective study groups typically have between three and five members.

Accessibility and Accommodations

Brown University is committed to full inclusion of all students. Please inform me early in the term if you may require accommodations or modification of any of course procedures. You may speak with me after class, during office hours, or by appointment. If you need accommodations around online learning or in classroom accommodations, please be sure to reach out to [Student Accessibility Services \(SAS\)](#) for their assistance (seas@brown.edu, 401-863-9588). Students in need of short-term academic advice or support can [contact one of the academic deans in the College](#).

Class Recording and Distribution of Course Materials

I would like to record our discussion because some students may be in different time zones, have poor internet connections, or have health issues. This means that we will record all classes to make them available to all students that are enrolled but cannot be present. If you have questions or concerns about this protocol, please contact me so that we can talk through those to also ensure your full participation in this course.

Lectures and other course materials are copyrighted. Students are prohibited from reproducing, making copies, publicly displaying, selling, or otherwise distributing the recordings or transcripts of the materials. The only exception is that students with disabilities may have the right to record for their private use if that method is determined to be a reasonable accommodation by Student Accessibility Services. Disregard of the University's copyright policy and federal copyright law is a Student Code of Conduct violation.

Use of Technology to Support Your Learning in This Course

This course will use the following technological platforms: Canvas and Google Drive. I am committed to ensuring access to online course resources by students. If you have any concerns or questions about access or the privacy of any of these platforms, please reach out to me.

The IT Service Center (<https://it.brown.edu/get-help>) provides many IT Services including remote assistance, phones, tickets, and chat. Please also see the [Online and Hybrid Learning Student Guide](#).

Assignment Due Dates

Schedule

Class	Unit	Assignment	Due Date
Sept 10	Unit 1a		
Sept 15	Unit 1b		
Sept 17	Unit 2a	Stata Training Exercise	
Sept 22	Unit 2b		
Sept 24	Unit 3a		
Sept 29	Unit 3b		
Oct 1	Unit 4a		
Oct 6	Unit 4b		
Oct 8	Unit 5a	Prob. Set #1	Oct 8 th 11:59 pm
Oct 13	Unit 5b		
Oct 15	Unit 6a		
Oct 20	Unit 6b		
Oct 22	Unit 7a	Prob. Set #2	Oct 22 nd 11:59 pm
Oct 27	Unit 7b		
Oct 29	Unit 8a	One-page Project Proposal	Nov 2 nd 11:59 pm
Nov 3	No Class – VOTE!		
Nov 5	Unit 8b		
Nov 10	Unit 9a	Prob. Set #3	Nov 10 th 11:59 pm
Nov 12	Unit 9b		
Nov 17	Unit 10a	Memo 1	Nov 17 11:59 pm
Nov 19	Unit 10b		
Nov 24	Unit 11a	Memo 2	Nov 24 11:59 pm
Nov 26	No Class - Thanksgiving		
Dec 1	Presentations		
Dec 3	Presentations		
		Final Paper	Dec 10 th 11:59 pm

Readings

(1) Unit 1 - Introduction: From the age of regression to causal inference; value-added models

A. Discussion Reading

- N/A

B. New Content Reading [Introduction; OLS Review and Value Added]

- Murnane and Willett, Ch. 1-3
- Review notes on regression from last semester

(2) Unit 2 - OLS Review and Value Added/ Randomized Experiments

A. Discussion Reading [OLS Review and Value Added]

- Claro, Susana, and Susanna Loeb. (2019). Students with Growth Mindset Learn More in School: Evidence from California's CORE School Districts. (EdWorkingPaper: 19-155). Retrieved from Annenberg Institute at Brown University: <http://www.edworkingpapers.com/ai19-155>

B. New Content Reading [Randomized Experiments]

- Murnane and Willett, Ch. 4 and 5
- [RECOMMENDED] Mosteller, F. (1995). The Tennessee study of class size in the early grades. *The Future of Children*, 5(2). pp. 113-127.

(3) Unit 3 – Randomized Experiments / Instrumental Variables- Extensions to RCTs

A. Discussion Reading [Randomized Experiments]

- Bettinger, E. P., Long, B. T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *The Quarterly Journal of Economics*, 127(3), 1205-1242.

B. New Content Reading [Instrumental Variables-Extensions to RCTs]

- Murnane & Willett, Ch. 11 pp. 265- 280
- [RECOMMENDED] Angrist, J. & Pischke, J. (2009). *Mostly Harmless Econometrics*. Princeton, NJ: Princeton University Press. pp.113-121.

(4) Unit 4 – Instrumental Variables- Extensions to RCTs/ Quasi- Experimental Designs - Panel Data and Fixed Effects

A. Discussion Reading [Instrumental Variables- Extensions to RCTs]

- Angrist, J. D., Cohodes, S. R., Dynarski, S. M., Pathak, P. A., & Walters, C. R. (2016). Stand and deliver: Effects of Boston's charter high schools on college preparation, entry, and choice. *Journal of Labor Economics*, 34(2), 275-318.

B. New Content Reading [Quasi- Experimental Designs - Panel Data and Fixed Effects]

- Barrow, L. & Rouse, C. (2005). Causality, Causality, Causality: The View of Education Inputs and Outputs from Economics. Paper prepared for the Federal Reserve Bank of Chicago.
- Stock and Watson Ch. 10

- **[RECOMMENDED]** Mostly Harmless Econometrics pp. 221- 226

(5) Unit 5 – Fixed Effects/ Difference-in-Differences

A. Discussion Reading [Fixed Effects]

- Taylor, E.S., & Tyler, J.H. (2012). The effect of evaluation on teacher performance. *American Economic Review*.

B. New Content Reading [Difference-in-Differences]

- Murnane & Willett, Ch. 8

(6) Unit 6 – Difference-in-Differences/ Interrupted Time Series

A. Discussion Reading [Difference-in-Differences]

- Bueno, Carycruz and Sass, Tim, The Effects of Differential Pay on Teacher Recruitment and Retention (May 1, 2018). Andrew Young School of Policy Studies Research Paper Series No. 18-07

B. New Content Reading [Interrupted Time Series]

- Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin Company, pp. 171-188
- Bloom, H. S. 2003. “Using ‘Short’ Interrupted Time-Series Analysis to Measure the Impacts of Whole-School Reforms: With Applications to a Study of Accelerated Schools.” *Evaluation Review* 27 (3): 3-49.

(7) Unit 7 – Interrupted Time Series/ Regression-Discontinuity Designs

A. Discussion Reading [Interrupted Time Series]

- Thomas S. Dee & Brian Jacob, 2011. "The Impact of No Child Left Behind on Student Achievement," *Journal of Policy Analysis and Management*, John Wiley & Sons, Ltd., vol. 30(3), pages 418-446, Summer.

B. New Content Reading [Regression- Discontinuity Designs]

- Murnane & Willett, Ch. 9
- **[RECOMMENDED]** Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin Company, pp. 207- 237

(8) Unit 8 – Regression- Discontinuity Designs/ Instrumental Variables Estimation

A. Discussion Reading [Regression- Discontinuity Designs]

- Cortes, K. E., Goodman, J. S., & Nomi, T. (2015). Intensive math instruction and educational attainment long-run impacts of double-dose algebra. *Journal of Human Resources*, 50(1), 108-158.

- Dee, T.S., & Penner, E. (2015). The Causal Effects of Cultural Relevance: Evidence from an Ethnic Studies Curriculum. *National Bureau of Economic Research Working Paper # 21865*.

B. New Content Reading [Instrumental Variables Estimation]

- Murnane & Willett, Ch. 10

(9) Unit 9 – Instrumental Variables Estimation/ Propensity Score Matching

A. Discussion Reading [Instrumental Variables Estimation]

- C. Kirabo Jackson & Rucker C. Johnson & Claudia Persico, 2016. "The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms," *The Quarterly Journal of Economics*, vol 131(1), pages 157-218.

B. New Content Reading [Propensity Score Matching]

- Murnane & Willett, Ch. 12
- Shadish, W.R., Cook, T.D., & Campell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. pp. 118-122.

(10) Unit 10 – Propensity Score Matching/ Statistical Power and Sample Size

A. Discussion Reading [Propensity Score Matching]

- Center for Research on Education Outcomes (CREDO) (2017). *Charter Management Organizations*. Palo Alto: CREDO, Stanford University.

B. New Content Reading [Statistical Power and Sample Size]

- Murnane & Willett, Ch. 6

(10) Unit 11 – Statistical Power and Sample Size

A. Discussion Reading [Statistical Power and Sample Size]

- TBD