

**Public Policy 712**  
**Causal Inference in Education Policy Research**

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Course Meeting Time and Location:

M/W: 2:30-4:00pm

Weill Hall 1220

Office hours: By appointment

**Overview**

This course examines several key policy areas in the realm of early learning and K-12 education. The two primary goals of the course are (1) to familiarize students with the arguments and evidence relating to important policies and/or interventions and (2) to provide students with the analytic framework and skills necessary to evaluate education (or other public) policies in general. Specific policy topics include early learning experiences, center-based early childhood programs, parental involvement in early childhood learning, preschool, test-based accountability (i.e., high-stakes testing, including No Child Left Behind), teacher effectiveness, and virtual schooling. Specific methodological techniques include randomized-control trials (RCT), regression discontinuity analysis (RD), comparative interrupted time series (CITS), Empirical Bayes, and a brief intro to several topics in psychometrics.

**Prerequisites**

Knowledge of introductory statistics (e.g., Stats 250, PP 529, SOE 793, or equivalent) and regression analysis (e.g., Stats 413, PP 639, SOE 794 or 795, or equivalent) are required for this course. For those students who are interested, a good refresher for statistics and regression analysis can be found in the following texts:

Rossi, Peter H., Freeman, Howard E., and Lipsey, Mark W. *Evaluation: A Systematic Approach*. Sixth Edition. Thousand Oaks, CA: Sage Publications, 1999. Chapter 7 (pp: 235-278).

Orr, Larry (1999). *Social Experiments*. Sage Publications, Thousand Oaks, CA. (Chapter 1, pp 1-30).

Schneider, B., Carnoy, M., Kilpatrick, J., Schmidt, W. H., & Shavelson, R. J. (2007). *Estimating causal effects using experimental and observational designs*. Washington, DC: American Educational Research Association. Chapter 3 (pp. 38-55).

Stock and Watson, *Introduction to Econometrics* (syllabus references are to 3<sup>rd</sup> edition, but older editions contain virtually identical content).

### **Course Requirements and Grading**

General Class Participation (10%) – Students are expected to attend class regularly and to have read the assigned material prior to class. Because this is a discussion-based course, the quality of the class will depend on whether students are prepared to talk about the readings each week.

Reading Quizzes (20%) – There will be 6 short quizzes spread throughout the course. These quizzes will contain basic questions about the class readings for that day, and are merely meant to check that students have done the reading. They will consist of 1-3 questions, each of which should take no more than 2 sentences to answer. A student's lowest quiz grade will be dropped in calculating his or her quiz average (the remaining 5 count 4% each).

Problem Sets (30%) – There will be 3 required problem sets for this course (10% each), each of which will have students using real data to do empirical exercises in Stata. Students are encouraged to work in small groups (max size 4) on the assignments, though each student is required to write up and submit his or her own version of the solutions. Students must indicate the other students with whom they worked at the top of the problem set.

Note: Stata will *not* be formally taught as part of this course. The instructors will provide students a variety of online materials to help them learn the commands necessary to complete the assignments, and will be available to answer questions in office hours. However, students should expect to work independently to learn the rudiments of the Stata language themselves.

Final Project (40%) – Students will have two options for the final project.

- (1) Policy Memo – The first option is intended for most MA or MPP students. For this assignment, students will be required to carefully read and analyze an empirical study, and relate the findings from the study to other material covered in the class. The goal of this exercise is to give students practice digesting and (importantly) communicating complicated technical material to a general audience. This assignment will not require any additional research beyond the assignment article and readings the student will have done throughout the course. More details (including some example memos) will be distributed toward the end of the class.
- (2) Independent Research Paper – This option is intended primarily to allow doctoral students the opportunity to explore a topic related to their independent research agenda. Course instructors must approve all projects in this category, and will consider whether the project moves the student forward in his or her dissertation or other independent research.

### **Course Materials**

Book chapters and journal articles, all of which will be available through CANVASS.

### **Readings**

Before most classes, we will post several questions about the readings to Canvas. Some of these questions will have "right" answers (e.g. "What population does a given paper study?") while many others will not ("Do you find their identification strategy convincing?"). You don't need to write up or turn anything in (but you may find this helpful to do); just be prepared to speak. Also make sure to bring the readings to class, as we will reference them. As for reading strategy, for the more technical papers a good strategy is to read the abstract, intro, results, conclusions, tables/figures first and see how many of the questions you can answer. Then go back and try to understand it a little bit better.

### **Software**

We will program in Stata, a software program used widely by researchers and policy analysts. Having "Stata" on your resume makes you more employable, so embrace it!

We provide links to online Stata tutorials and offer training in sections. Since there is no computer lab large enough to hold our class, you will rely on your laptops to practice Stata programming during these sections. *You must therefore own a copy of Stata.*

You can get a Stata license for just this semester at a very affordable price. Order through the Stata website (<http://www.stata.com/order/new/edu/gradplans/us-pickup/>) and then pick up at Computer Showcase. You will need to have the most recent version of Intercooled Stata.

### **Academic Expectations & Resources**

Please read the information at the link below for important information on topics such as academic integrity, accommodations for students with disabilities, inclusivity and others. We expect students to be familiar with all of the expectations and resources described herein:

<http://fordschool.umich.edu/academics/expectations>

## Module 1: 0-5 Care and Education

### Class Schedule and Reading List

#### Class 1, September 7: Course introduction

Read the syllabus in advance of class. Come prepared with any questions.

Read the Milkie et al. article summary.

Read this article that covered the Milkie study: [https://www.washingtonpost.com/local/making-time-for-kids-study-says-quality-trumps-quantity/2015/03/28/10813192-d378-11e4-8fce-3941fc548f1c\\_story.html?tid=HP\\_more](https://www.washingtonpost.com/local/making-time-for-kids-study-says-quality-trumps-quantity/2015/03/28/10813192-d378-11e4-8fce-3941fc548f1c_story.html?tid=HP_more)

*Recommended but not required:* Milkie, M. A., Nomaguchi, K. M., & Denny, K. E. (2015). Does the amount of time mothers spend with children or adolescents matter? *Journal of Marriage and Family*, 77(2), 355-372.

#### Class 2, September 12: Intro to early childhood

The White House. (2014). *The economics of early childhood investments*. Available at: [https://www.whitehouse.gov/sites/default/files/docs/early\\_childhood\\_report1.pdf](https://www.whitehouse.gov/sites/default/files/docs/early_childhood_report1.pdf)

Ellwood, David (1988). Chapter 2: Values and the helping conundrum. *In Poor Support: Poverty in the American Family* (pp 14-44).

*Focal questions:* Why care about the early years? What do children need in the early years? What are the primary public education and care programs for children aged 0-5 in the U.S.? What tensions do U.S. cultural values must policy in this area confront?

#### Class 3, September 14: Gaps in early experiences and the power of descriptive research

Bassok, D., Lee, R., Reardon, S. F., & Waldfogel, J. (2015). *Socioeconomic gaps in early childhood experiences, 1998 to 2010*. Unpublished manuscript. Available at: [http://curry.virginia.edu/uploads/resourceLibrary/38\\_Gaps\\_In\\_Early\\_Experience.pdf](http://curry.virginia.edu/uploads/resourceLibrary/38_Gaps_In_Early_Experience.pdf)

*Focal questions:* What are the gaps in early childhood experiences between advantaged and disadvantaged children? How do we know?

#### Class 4, September 19: Introduction to randomized controlled trials

Murnane, R., & Willett, J. (2011). *Methods Matter*, Chapter 4.

*Focal questions:* What are the nuts and bolts of an RCT study?

### **Class 5, September 21: Imperfect compliance and alternative assignment approaches**

Gennetian, L., Morris, P., Bos, J., & Bloom, H. (2005). Using instrumental variables analysis to learn more from social policy experiments. In H. Bloom (Ed.) *Learning More from Social Experiments: Evolving Analytic Approaches* (pp. 75-88). New York: Russell Sage.

Duflo, E., Glennerster, R., & Kremer, M. (2006). Using randomization in development economics research: A toolkit. Available online: <http://www.povertyactionlab.org/sites/default/files/documents/Using%20Randomization%20in%20Development%20Economics.pdf>. (Read section 3.3, "Alternative Methods of Randomization," pp. 24-28).

*Focal question:* How do you adjust for treatment no-shows and control cross-overs? What are alternative approaches to random assignment?

### **Class 6, September 26: Engaging parents in young children's learning using technology**

York, B. N., & Loeb, S. (2014). *One step at a time: The effects of an early literacy text messaging program for parents of preschoolers* (No. w20659). National Bureau of Economic Research.

Also, watch the Vroom! video (<https://www.youtube.com/watch?v=trm38G2e5NE>) and then download the Vroom! app here to your smart phone: <http://www.joinvroom.org/>. Enter a profile for your child (real or imagined – pick the child age (0-5) of your choice). For four days, check the app daily for a tip for interacting with your child. If you have a young child and like the tip, try it out.

Come to class prepared to discuss at least one of these tips – Did it sound like fun? What skill was it trying to build? (No smart phone? Complete the activity using examples of activities here: <http://www.joinvroom.org/tools-and-activities>)

*Focal questions:* What are the promises and pitfalls of new technology-based approaches to engaging parents in their young children's learning?

### **Class 7, September 28: Center-based care**

Love, J. M., Kisker, E. E., Ross, C., Raikes, H., Constantine, J., Boller, K., ... & Fuligni, A. S. (2005). The effectiveness of early head start for 3-year-old children and their parents: Lessons for policy and programs. *Developmental Psychology*, 41(6), 885.

*Focal question:* Does center-based care 0-3 promote or hinder child development?

### **Class 8, October 3: Preschool**

Read Chapter 1 (High Hopes) of Zigler, E., & Muenchow, E., (1992). *Head Start: The inside story of American's most successful educational experiment*. New York: Basic Books.

Duncan, G. J., & Magnuson, K. (2013). Investing in preschool programs. *The Journal of Economic Perspectives*, 27(2), 109.

*Focal questions:* How historically has the U.S. supported public preschool? What is the evidence to support investment in public preschool?

### **Class 9, October 5: Regression discontinuity**

Bloom, H. (2012). Modern regression discontinuity analysis. *Journal of Research on Educational Effectiveness*, 5, 43-82. (SKIP the section on power (p. 64-68)).

### **Class 10, October 10: State-funded pre-k**

Gormley, W.T., Phillips, D.A., & Gayer, T. (2008). Preschool programs can boost school readiness. *Science*, 320, 1723-24. (Note: As common with *Science* articles, there is a supplemental online appendix for this article. Read it too.)

Barnett, W. S., Friedman-Krauss, A. H., Gomez, R. E., Horowitz, M., Weisenfeld, G. G., & Squires, J. H. (2016). *Executive summary: The State of Preschool 2015: State Preschool Yearbook*. New Brunswick, NJ: National Institute for Early Education Research. Read p. 1-39. Available here: <http://nieer.org/research/state-preschool-2015>

*Focal questions:* How is state-funded pre-k different from Head Start and how much does it vary across states? Does it work? What are the shortcomings of the age-cutoff pre-k design as typically implemented?

### **Class 11, October 12: What should preschool today look like?**

Duncan, G., Jenkins, J., Auger, A., Bitler, M., Domina, T., & Burchinal, M. (2016). *Boosting school readiness: Should preschools target skills or the whole child?* Available here: [http://inid.gse.uci.edu/files/2011/03/Duncan\\_etal\\_Preschool\\_JHRsubmit.pdf](http://inid.gse.uci.edu/files/2011/03/Duncan_etal_Preschool_JHRsubmit.pdf)

*Focal questions:* What should preschool programs teach? Are some approaches better than others?

### **October 17: No class (fall break)**

### **Class 12, October 19: Do the benefits of preschool persist?**

Bailey, D., Duncan, G.J., Odgers, C., & Yu, W. (2016). *Persistence and fadeout in the impacts of child and adolescent interventions*. Manuscript under review.

*Focal questions:* Why might the effects of preschool last and why might they not? Given the evidence on fadeout, should the U.S. invest in publicly funded preschool? How can we figure out the drivers of fadeout?

**Class 13, October 24: The new frontier of preschool research**

Dr. JoAnn Hsueh, MDRC will join us remotely as guest speaker to discuss MDRC's new early childhood initiative, ExCEL.

Readings TBA

Module 2: Elementary and Secondary Education  
Class Schedule and Reading List  
(\* = required)

**Section I: Test based accountability**

**Class 14 – Introduction to school accountability**

Readings

\*David Figlio and Susanna Loeb (2011). “School Accountability.” Chapter 8 in the Handbook of the Economics of Education.

\*Derek Neal (2013). “The consequences of using one assessment system to pursue two objectives.” *Journal of Economic education*, 44(4): 339-352.

**Class 15 – Introduction to Interrupted Time Series Designs**

Readings

\*William Shadish, Thomas D. Cook, Donald Campbell. “Experimental and Quasi-Experimental Designs for Generalized Causal Inference.” Shadish et al., Chapter 6 “Quasi-Experiments: Interrupted Time Series Designs”

\*Howard Bloom (2003). “Using Short Interrupted Time-Series Analysis to Measure the Impacts of Whole-School Reforms”. *Evaluation Review* 2003, 27:3

**Class 16 – No Child Left Behind**

Readings

\*Dee, Thomas and Jacob, Brian (2011). “The Impact of No Child Left Behind on Student Achievement.” *Journal of Policy Analysis and Management*, 30(3): 418-446.

Randall Reback, Jonah Rockoff and Heather Schwartz (2014). "Under Pressure: Job Security, Resource Allocation, and Productivity in Schools under NCLB." *American Economic Journal: Economic*. 6(3): 207-41

**Class 17 – Other approaches to school accountability**

Readings

\*Iftikhar Hussain. Subjective Performance Evaluation in the Public Sector: Evidence From School Inspections, *Journal of Human Resources*, Winter 2015 Vol 50, no. 1, pp 189-221.



## Section II: Teacher-Related Policies

### Class 18 – An Intro to Teacher-Related Policies

#### Readings

\* Murnane, Richard and Jennifer Steele (2007). “What is the Problem? The Challenges of Providing Effective Teachers for All Children.” *The Future of Children*, 17(2). (Special Issue: Excellence in the Classroom. Policies to Improve the Teacher Workforce.)

\*Jacob, B. (2007). “The Challenges of Staffing Urban Schools with Effective Teachers.” *The Future of Children*, 17(2). (Special Issue: Excellence in the Classroom. Policies to Improve the Teacher Workforce.)

Lankford, Hamilton, Loeb, Susanna and James Wyckoff (2002). “Teacher Sorting and the Plight of Urban Schools.” *Educational Evaluation and Policy Analysis* 24 (2002): 37-62.

Eric A. Hanushek and Steven G. Rivkin (2007). “Pay, Working Conditions and Teacher Quality.” *The Future of Children*, 17(2). (Special Issue: Excellence in the Classroom. Policies to Improve the Teacher Workforce.)

“The Widget Effect: Our National Failure to Acknowledge and Act on Differences in Teacher Effectiveness.” A report released by The New Teacher Project, 2009. (Read executive summary and skim the rest of the report if interested.)

### Class 19 - Teacher Value-Added Measures

The goal of this class is to introduce students to the conceptual underpinnings of teacher value-added measures as well as the technical estimation of these measures. We will also discuss potential concerns with using value-added measures for policy purposes.

\*Jonah Rockoff, Cory Koedel and Kata Mihaly (2015). "Value-Added Modeling: A Review," *Economics of Education Review*, August 2015, 47:180-195

\*\*“Problems with the Use of Student Test Scores to Evaluate Teachers.” Economic Policy Institute, Policy Brief 278, August 2010.

\*\*“Evaluating Teachers: The Important Role of Value-Added.” Report released by the Brown Center on Education Policy at Brookings, November 2010.

The Carnegie Knowledge Network, sponsored by the Carnegie Foundation on Teaching and Learning, has produced a series of brief reports that provide a good overview of many topics related to VAM. <http://www.carnegieknowledgenetwork.org/knowledge-briefs/>

*Some key articles on the current debates*

Rothstein, J. (2010). Teacher quality in educational production: tracking, decay, and student achievement. *Quarterly Journal of Economics*, 125(1), 175-214.

Chetty, Friedman and Rockoff (2014a): "Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates," *American Economic Review*, 104, 2593– 2632.

——— (2014b): "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood," *American Economic Review*, 104, 2633–2679.

Rothstein, Jesse (2014). Revisiting the Impact of Teachers: Response to CFR

CFR (August 2015). "Measuring the Impacts of Teachers: Response to Rothstein." Center for Economic Policy Research, Discussion Paper 10768.

Rothstein, Jesse (Oct 2015). Revisiting the Impact of Teachers (updated)

### **Classes 20 & 21 – Teacher Evaluation**

The goal of this class is to discuss different approaches for evaluating and providing feedback to teachers. We will learn about the underlying theory behind them and the empirical evidence regarding the effects of such evaluation.

#### Readings

Each student will be assigned one of the readings below. In class, students will split into groups to discuss the readings, and then present them to the rest of the class.

\*Dee, T., & Wyckoff, J. (2015). "Incentives, selection, and teacher performance: evidence from IMPACT." *Journal of Policy Analysis and Management* 34(2): 267-297.

\*Glazerman, S. and A. Seifullah (2012). An Evaluation of the Chicago Teacher Advancement Program (Chicago TAP) After Four Years. Princeton: Mathematica Policy Research.

\*Springer, M., Ballou, D., Hamilton, L., Vi-Nhuan, L., Lockwood, J., MMcCaffrey, D., Pepper, M., & Stecher, B. (2010). Teacher pay for performance: experimental evidence from the Project on Incentives in Teaching. Retrieved from [http://www.rand.org/content/dam/rand/pubs/reprints/2010/RAND\\_RP1416.pdf](http://www.rand.org/content/dam/rand/pubs/reprints/2010/RAND_RP1416.pdf).

\* Taylor, Eric S. and John H. Tyler. 2012. The Effect of Evaluation on Teacher Performance. *American Economic Review* 102(7), 3628-3651.

\*Glazerman, Steven, Ali Protik, Bing-ru Teh, Julie Bruch, Jeffrey Max and Elizabeth Warner. 2013. Transfer Incentives for High-Performing Teachers: Final Results from a Multisite Randomized Experiment. United States Department of Education.

\*Rockoff, Jonah E., Douglas O. Staiger, Thomas J. Kane and Eric S. Taylor. 2012. Information and Employee Evaluation: Evidence from a Randomized Intervention in Public Schools. American Economic Review 102(7), 3184-3213

## **Class 22 – A Brief and Selected Discussion of Psychometrics**

### Readings

\*Jacob, Brian and Rothstein, Jesse (2016). "The Measurement of Student Ability in Modern Assessment Systems." Journal of Economic Perspectives.

\*Evidence Speaks note on student test scores (August 11, 2016)

\*Comments by Andrew Ho

### **Section III – Technology and Education**

#### **Class 23 – An introduction to technology and education**

##### Readings

\*Jacob et al. (2016). “Can Technology Help Promote Equality of Educational Opportunities?” Working Paper.

#### **Class 24 – Technology and the Education Production Function**

##### Readings

\*Jackson, Kirabo and Alexey Makarin (2016). “Simplifying Teaching: A Field Experiment with Online “Off-the-Shelf” Lessons.” NBER #22398.

Taylor, Eric S. (2015). “New Technology and Teacher Productivity” Working paper.

#### **Class 25 – Educational technology outside the classroom**

Each student will be assigned one set readings below. In class, students will split into groups to discuss the readings, and then present them to the rest of the class.

##### Readings

###### Set 1 –

\*Elliot et al. (December 2013). “Uses and Limitations of Automated Writing Evaluation Software. WPA Research Bibliography.

###### Set 2 –

\*Read about MyTeachingPartner (MTP) at <http://curry.virginia.edu/research/centers/castl/mtp>

\*Allen, J. P., Pianta, R. C., Gregory, A., Mikami, A. Y., & Lun, J. (2011). An interaction-based approach to enhancing secondary school instruction and student achievement. *Science*, 333(6045), 1034-1037. doi:10.1126/science.1207998

Mikami, A. Y., Gregory, A., Allen, J. P., Pianta, R. C., & Lun, J. (2011). Effects of a teacher professional development intervention on peer relationships in secondary classrooms. *School Psychology Review*, 40(3), 367-385.

Set 3 -

\*Peter Bergman, Chana Edmond-Verley and Nicole Notario-Risk. “Parent Skills and Information Asymmetries: Experimental Evidence from Home Visits and Text Messages in Middle and High Schools.”

Peter Bergman. “Parent-Child Information Frictions and Human Capital Investment: Evidence from a Field Experiment Investment”

Peter Bergman. “Technology Adoption in Education: Usage, Spillovers and Student Achievement”