Public Policy 712/Education 712

Causal Inference in Education Policy Research I:
Early Childhood through High School
Fall M/W: 10:00-11:20 AM
1220 Weill Hall, Ford School

Professor Christina Weiland
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Office hours
By appointment – please email for a slot

Overview and objectives

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, school choice, and research-practice partnerships. Specific methodological techniques include randomized-control trials (RCT), regression discontinuity analysis (RD), descriptive research, and lottery-based identification. We will also be studying topics related to the Institute of Education's SEER standards (https://ies.ed.gov/seer/scaling.asp).

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.

Course Requirements and Grading

Data Analysis Exercises (3)   *50%*
You will replicate and extend analyses that use the quantitative methods of the course. You will work singly or with one classmate; if you work with a classmate you will submit a single product. Problem sets 1 and 2 are worth 20% and Problem set 3 is worth 10%.

Take-Home Final Exam OR Research Project   *30%*
A take-home exam is due on the last day of class (Dec. 7, 10AM) and will be provided by 5 PM on the Wednesday before. Doctoral students can (and IES fellows are required to) instead complete a research product that will be defined in consultation with me. Drafts of this research product will be due on specified dates.

Reading Questions   *20%*
I will post questions about some of the readings (to be completed before class). All times of the semester, you should write down your answers. Four times during the semester (5% each; your choice of when), you will submit copies of your answers before class.

Participation
I expect active questioning in class. To further widespread participation, I will sometimes randomly call on students. The randomness is intended not to intimidate but to keep participation evenly distributed. Please let me know in advance if you need to miss class. ___***Please do not come to class if you are ill. Please just watch the recorded lecture later. Missing class due to illness will not affect your grade.***___

We're still in a pandemic
All class deadlines are flexible (except reading questions – they need to be completed before that particular class for credit for the four required submission). Please communicate your needs to me through email and in office hours.

Readings
You are expected to complete the assigned reading before class. There will typically be one or two articles assigned for each class.

You must read these closely in order to 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.

Course Material
One required book is available for <u>free download</u> from the UM Library:

Murnane, R., & Willett, J. (2010). *Methods matter: improving causal inference in educational*

and social science research. New York, NY: Oxford University Press, USA.

There is no course packet. All articles are available online or on the CANVAS site. Assignments will be listed under the relevant lecture at least a week in advance. I try to provide links and/or PDFs but you are ultimately responsible for obtaining the readings. If a link is broken or a file corrupted, please find the article yourself.

Software

We will program in Stata, a software program used widely by researchers and policy analysts. I will give you Stata code for problem sets. You are welcome to use other programs instead but I will not provide support or help with code in other programming languages.

You can get a Stata license for just this semester. Order through the Stata website (http://www.stata.com/order/new/edu/gradplans/us-pickup/). You will need Intercooled Stata to use the large datasets we will work with.

Assignment Schedule

All Students	Doctoral Student Option	Due
	Research product proposal: ½ page	9/12
	Revised proposal (1 p)	9/21
Problem set #1 (posted 9/19)		10/5
	Progress Memo (paper option)	10/12
Problem set #2 (posted 10/12)		10/31
Problem set #3 (posted 11/16)		11/30
Take-home final (posted 11/30)	Research Product	12/7

FORD SCHOOL OF PUBLIC POLICY INCLUSIVITY STATEMENT

Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value one another's opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community

Accommodations for Students with Disabilities: If you believe you need an accommodation for a disability, please let your instructor know at your earliest convenience. Some aspects of courses may be modified to facilitate your participation and progress. As soon as you make your instructor aware of your needs, they can work with the Services for Students with Disabilities (SSD) office to help determine appropriate academic accommodations. Any information you provide will be treated as private and confidential.

Student Mental Health and Well-Being Resources: The University of Michigan is committed to advancing the mental health and well-being of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impact students' academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, counseling and mental health services are available. For help, contact Counseling and Psychological Services (CAPS) and/or University Health Service (UHS). This includes the Ford School embedded CAPS counselor.

In a crisis or emergency, students can call the CAPS Counselor on Duty at 734-764-8312 during business hours, or the same number and then press 0 after hours.   For a listing of other mental health resources available on and off campus: http://umich.edu/~mhealth/

Please review additional information and policies regarding academic expectations, academic integrity, and resources at the Ford School of Public Policy at this link: http://fordschool.umich.edu/academics/expectations

I expect students to be familiar with all of the expectations and resources described therein.

READING LIST

Introduction

Class 1, Monday, August 29: Overview

Murnane, R., & Willett, J. (2010). *Methods matter: Improving causal inference in educational and social science research.* New York, NY: Oxford University Press, USA. Chapters 1-2. Available here:
http://ebookcentral.proquest.com.proxy.lib.umich.edu/lib/umichigan/detail.action?docID=57879
1

Optional:

Angrist, J. (2004). "American education research changes tack." *Oxford Review of Economic Policy, 20*, 198-212 (stop after p. 203)

Cook, T.D. (2002). "Randomized experiments in educational policy research: A critical examination of the reasons the education evaluation community has offered for not doing them." *Educational Evaluation and Policy Analysis, 24*, 175-199.

Module 1: Early Childhood and Randomized Trials

Class 2, Wednesday, August 31: Early childhood policy context

Waldfogel, J. (1998). Infants and Toddlers (p. 36-45) and Preschool-Aged Children (p. 83-85). Chapter excerpts from *What Children Need*, Cambridge, MA: Harvard University Press, 2010.

Duncan, G., & Magnuson, K. (2013). Investing in preschool programs. *Journal of Economic Perspectives, 27*(2), 109-132.

Optional:

Chaudry, A., & Datta, A.R. (2017). *The current landscape for public pre-kindergarten programs*. Washington DC and Durham NC: Brookings Institute and Duke Center for Child and Family Policy.

NO CLASS Monday, September 5, Labor Day

Class 3, Wednesday, September 7: Introduction to randomized controlled trials

Murnane & Willett, Chapter 4,
http://ebookcentral.proquest.com.proxy.lib.umich.edu/lib/umichigan/detail.action?docID=578791

Duflo, E., Glennerster, R., & Kremer, M. (2006). *Using randomization in development economics research: A toolkit*. Section 3.3, "Alternative Methods of Randomization," pp. 24-28.

Class 4, Monday, September 12: Imperfect compliance

Murnane & Willett, Chapter 5,
http://ebookcentral.proquest.com.proxy.lib.umich.edu/lib/umichigan/detail.action?docID=578791

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.

Class 5, Wednesday, September 14: Fixed vs. random effects

Murnane & Willett, Chapter 7, pp. 107-120 (start: beginning of chapter, stop: "Statistical power when intact groups…" subheading) & 128-134 (start: Fixed-effects multilevel models to estimate effect size…, stop: end of chapter).
http://ebookcentral.proquest.com.proxy.lib.umich.edu/lib/umichigan/detail.action?docID=578791

Class 6, Monday, September 19: How do we improve preschool quality?

Yoshikawa, H., Leyva, D., Snow, C. E., Treviño, E., Barata, M., Weiland, C., ... & Arbour, M. C. (2015). Experimental impacts of a teacher professional development program in Chile on preschool classroom quality and child outcomes. *Developmental Psychology*, *51*(3), 309.

Class 7, Wednesday, September 21: Identifying and Measuring Core Components and the Treatment-Control Contrast

Weiss, M. J., Bloom, H. S., & Brock, T. (2014). A conceptual framework for studying the sources of variation in program effects. *Journal of Policy Analysis and Management*, *33*(3), 778-808.

Optional:
Hulleman, C. S., Rimm-Kaufman, & Abry, T. (2013). Innovative methodologies to explore implementation: Whole-part-whole – construct validity, measurement, and analytical issues for intervention fidelity assessment in education research. In T. Halle, A. Metz, & I. Martinez-Beck (Eds.), *Applying Implementation Science in Early Childhood Programs and Systems*, Baltimore,

MD: Brookes Publishing, pp. 65-93.Class 8, Monday, September 26: What about parenting interventions?

Class 8, Monday, September 26: Parenting Interventions

York, B. N., Loeb, S., & Doss, C. (2018). One step at a time: The effects of an early literacy text messaging program for parents of preschoolers. *Journal of Human Resources.*

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)

Class 9, Wednesday, September 28: Subgroup analysis

Bloom, H. & Michalopoulos, C. (2013). When is the story in the subgroups? Strategies for interpreting and reporting intervention effects for subgroups. *Prevention Science, 14,* 179-188.

Optional
Shapiro, A., & Weiland, C. (2019). What Is in a Definition? The How and When of Special Education Subgroup Analysis in Preschool Evaluations. *Educational Evaluation and Policy Analysis*, *41*(2), 145-163.

Class 10, Monday, October 3: Reading Partners

Jacob, R., Armstrong, C., Bowden, A. B., & Pan, Y. (2016). Leveraging volunteers: An experimental evaluation of a tutoring program for struggling readers. *Journal of Research on Educational Effectiveness*, *9* (sup1), 67-92. Available at: https://edre.uark.edu/_resources/pdf/rp_jree.pdf -- SKIM COST SECTIONS (we will return to them at the end of the semester).

Note: No reading questions for this class.

Guest speaker: Robin Jacob, University of Michigan

Module 2: Descriptive Analysis and Research-Practice Partnerships

Class 11, Wednesday, October 5: Descriptive Research

Loeb, S., Dynarski, S., McFarland, D., Morris, P., Reardon, S., & Reber, S. (2017). *Descriptive analysis in education: A guide for researchers. (NCEE 2017–4023).* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.

Lewis, K., Kuhfeld, M., Ruzek, E., & McEachin, A. (2021). *Learning during COVID-19: Reading and math achievement in the 2020-2021 school year.* https://content.acsa.org/wp-content/uploads/2021/11/Learning-During-COVID-19-Reading-and-Math-NWEA-Brief.pdf

Guest speaker: Andrew McEachin, NWEA

Class 12, Monday, October 10: Research-Practice Partnerships

Coburn, C.E., Penuel, W.R., & Geil, K.E. (2013). *Research-Practice Partnerships: A Strategy for Leveraging Research for Educational Improvement in School Districts.* William T. Grant Foundation, New York, NY. https://files.eric.ed.gov/fulltext/ED568396.pdf

Reading to be announced - New Orleans RPP

Guest speaker: Lindsay Weixler, Tulane University (and UM PhD graduate)

Module 3: Regression Discontinuity

Class 13, Wednesday, October 12: Regression Discontinuity Part I

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

NO CLASS – Monday, October 17 (Fall Break)

Class 14, Wednesday, October 19: Regression Discontinuity Part II

No readings or reading questions for class this day. Please come to class prepared to use Stata on your laptop for an in-class exercise (i.e., have the program + dataset already downloaded on your machine).

Class 15, Monday, October 24: Impacts of state pre-K

Wong, V. C., Cook, T. D., Barnett, W. S., & Jung, K. (2008). An effectiveness-based evaluation of five state pre-kindergarten programs. *Journal of Policy Analysis and Management: The Journal of the Association for Public Policy Analysis and Management*, *27*(1), 122-154. Retrieve here: https://onlinelibrary.wiley.com/doi/pdf/10.1002/pam.20310

Class 16, Wednesday, October 26: Does School Starting Age Matter?

Shapiro, A. (2020). Over-Diagnosed or Over Looked? The Effect of Age at Time of School Entry on Students Receiving Special Education Services. *Exceptional Children.* https://doi.org/10.1177/00144029221108735

Note: No reading questions this class.

Guest speaker: Anna Shapiro, University of Virginia

Module 4: School Choice and Lotteries as Identification

Class 17, Monday, October 31: Policy Context and Overview

Fuller, B., Elmore, R.F., & Orfield, G. (1996). Policy-making in the dark: Illuminating the school choice debate. *Who Chooses? Who Loses? Culture, Institutions and the Unequal Effects of School Choice, pp. 1-21.* New York, NY: Teachers College Press.

Moskowitz, E. (2017). Test scores don't lie: Charter schools are transformative. *Wall Street Journal,* August 23, 2017.

Class 18, Wednesday, November 2: Small Schools of Choice

Bloom, H. S., & Unterman, R. (2014). Can small high schools of choice improve educational prospects for disadvantaged students?. *Journal of Policy Analysis and Management*, *33*(2), 290-319. https://www.studentachievement.org/wp-content/uploads/Small_high_schools_of_choice.pdf

Class 19, Monday, November 7: Pre-K lotteries

Weiland, C., Unterman, R., Shapiro, A., Staszak, S., Rochester, S., & Martin, E. (2020). The effects of enrolling in oversubscribed prekindergarten programs through third grade. *Child Development*, *91*(5), 1401-1422.

Class 20, Wednesday, November 9: Improving Pre-K Lottery studies

Weiland, C., Unterman, R., Dynarski, S., Abenavoli, R., Bloom, B…. & Weixler, L. (2022). *Lottery-based evaluations of early education programs: Opportunities and challenges for building the next generation of evidence.*

Note: This is a paper under review that could use your help! Instead of reading questions, I will assign you to a group that will make detailed suggestions for how to improve a section of the paper. Come to class with your notes on what you don't understand about your assigned section,

what it is missing, and what you think could improve it. In class, we you will meet with members of your group to consolidate feedback and then present it to the class.

Optional: Monarrez, Greenberg, Luetmer, & Chien. (2020). *Using centralized lotteries to measure preschool impact: Insights from the DC Prekindergarten study.* https://www.urban.org/sites/default/files/publication/103151/using-centralized-lotteries-to-measure-preschool-impact_0.pdf

Module 5: Additional SEER Standards and Other Topics

Class 21, November 14: Mixed Methods

Gibson-Davis, C., & Duncan, G. J. (2005). Qualitative/quantitative synergies in a random-assignment program evaluation. In T. S. Weisner (Ed.), *Discovering successful pathways in children's development: New methods in the study of childhood and family life* (pp. 283–303). Chicago: University of Chicago Press.

Class 22, November 16: Missing Data (Asynchronous)

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*, 549-576.

Notes: There will be an asynchronous lecture and then you will use the rest of class time to work on problem set #3 (which is on missing data). There are no reading questions for this class. Here is the link to the asynchronous lecture: https://umich.zoom.us/rec/share/SKlPJvbkNcApu6d2lbIITLCbBTArI6GZBLkrRbdMPhXgtWYsz2o6BKeCbUL4cGDd.AyRErDCHdfccGvx7

Additional reading (not required);
Puma, M.J., Olsen, R.B., Bell, S.H., & Price, C. (2009). *What to Do When Data Are Missing in Group Randomized Controlled Trials (NCEE 2009-0049).* Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Class 23, Monday, November 21: Cost Analysis

Institute of Education Sciences. (2020). *Cost Analysis: A Toolkit (IES 2020-001).* U.S. Department of Education. Washington, DC: Institute of Education Sciences. Available at: https://ies.ed.gov/seer/pdf/IES_Cost_Analysis_Starter_Kit_V1.pdf

Jacob, R., Armstrong, C., Bowden, A. B., & Pan, Y. (2016). Leveraging volunteers: An experimental evaluation of a tutoring program for struggling readers. *Journal of Research on Educational Effectiveness*, *9* (sup1), 67-92. Available at: https://edre.uark.edu/_resources/pdf/rp_jree.pdf -- READ COST SECTIONS CAREFULLY; YOU READ THE OTHER PARTS EARLIER IN THE SEMESTER

Note: I will draw slides for this class largely from Brooks Bowden's 2020 SREE training. The

Webinar (optional) and slides are available here: https://www.sree.org/webinar

NO CLASS – Wednesday, November 23 (Thanksgiving break)

Class 24, Monday, November 28: Pre-registration

Gehlbach, H., & Robinson, C. D. (2018). Mitigating illusory results through preregistration in education. *Journal of Research on Educational Effectiveness*, *11*(2), 296-315.

In class, we will examine two pre-registration approaches together:

https://aspredicted.org/ **(Please make an account for yourself before class begins)**

https://sreereg.icpsr.umich.edu/sreereg/ (We will use demo mode – no need to make an account)

Class 25, Wednesday, November 30: Meaningful Outcomes

Slavin, R. (2019). *Developer- and Research-Made Measures.* Available here:
https://robertslavinsblog.wordpress.com/2019/10/24/developer-and-researcher-made-measures/

Before class, familiarize yourself with this website (spend about 20-30 minutes navigating it and reading it): https://edinstruments.com/

Class 26, Monday, December 5: Power analysis
Murnane, R., & Willett, J. (2010). *Methods matter: Improving causal inference in educational and social science research.* New York, NY: Oxford University Press, USA. Chapter 6.
Available here:
http://ebookcentral.proquest.com.proxy.lib.umich.edu/lib/umichigan/detail.action?docID=578791

In class, we use PowerUP!, which you can download here:
https://www.causalevaluation.org/power-analysis.html

Class 27, Wednesday, December 7: Wrap up