THE UNIVERSITY OF CHICAGO

HARRIS SCHOOL OF PUBLIC POLICY

PPHA 58002 - Data Analytics II: Introduction to Program Evaluation

Dr. Christopher Clapp

Syllabus, Fall 2023

Class
In-Person: Th 6:00-8:50pm   Location: Convene, Hub 2
Online: Th 6:00-7:30pm   Location: Zoom

Professor: Chris Clapp (he/him)   Email: cclapp@uchicago.edu
Office Hours: M 7:00-8:00pm   Location: Zoom
or by appointment

TA: Harsh Pachisia (he/him)   Email: harshpachisia@uchicago.edu
Office Hours: Su 5:30-6:30pm   Location: Zoom

Course Description

How do we know whether a policy or program delivers its promised results or falls short? If it delivers, how do we know whether it was by chance or a true result that would replicate in a similar setting? If it is a true result, will it scale if implemented more broadly? This class will teach you the tools that economists and other social scientists use to determine the causal effects of different actions and make more informed decisions.

Learning Goals: "What's My Incentive for Taking This Course?"

Specifically, the purpose of the course is to introduce you to program evaluation techniques and provide an overview of current issues and methods. The course is designed to make you good *consumers* of these techniques. This will allow you to use the results from program evaluations, select contractors to carry them out, and/or supervise the work of others. It might even be a springboard on your way to being a *producer* of clever evaluations that inform better policy and make the world a better place.

You'll also benefit from an increased understanding of how we use data and statistics to understand what's going on around us. Why does this matter? As journalist Clive Thompson once stated, "We live in a world where the thorniest policy issues increasingly boil down to arguments over what the data mean. If you don't understand statistics, you don't know what's going on - and you can't tell when you're being lied to."

Along the way you can expect to:

- Understand what to evaluate and why we should care about the impacts of interventions.

- Appreciate why the counterfactual outcomes problem makes program evaluation inherently difficult.

- Learn techniques designed to address that problem and inform the effects of different interventions.

- Recognize the limits of the tools covered, specifically, when they can and cannot be used to produce meaningful information.

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- Become fluent in the lingo of program evaluations and practice being critical, but not pessimistic, readers of actual program evaluations.

- Become comfortable using the results of program evaluations to inform decisions and make the world a better place!

Instruction, Assignments, and Evaluation: "How Will This Class Work?"

First, let me provide a quick overview of the structure of the class. Think of each class as being divided into two parts: theory and practice. For the theory component, I will introduce and explain the theoretical underpinnings of different program evaluation techniques.[1] For the practice component, students will read papers that use the given technique, submit presentation slides that summarize how the papers applied the technique, and participate in a (in-person or synchronous) class discussion of those readings.

Your final grade in this course will be related to performance in several areas. The weight placed on each component will be as follows:

Presentation Slides (5 of 6)	60%
Final Exam	40%

Presentation Slides   The structure of the class requires active, attentive, inquisitive participation in class discussions.[2] As such, you are expected to have read and thought about the assigned paper(s) in advance of class. To help you with this, each week, you will submit presentation slides that you could use to present how the papers you read applied the given program evaluation technique. Guidelines for how to prepare these presentations are included at the end of this syllabus. You should upload your presentations via the Gradescope application on Canvas by 6:00pm on the day of our class meetings. Your presentations will be graded (blindly), and the lowest grade will be dropped.[3] You are welcome (and encouraged) to form study groups (of no more than 2 students) to discuss the readings with each other and create slides together. To ease TA grading responsibilities, you may submit one PDF of slides for your group, but everyone is expected to actively contribute to all parts of the slides.[4]

Final Exam   A take-home final exam will be handed out after the last class. It will be due at 11:45pm on Wednesday, December 6th. You must work independently on the final exam. You are not permitted to discuss the exam or exam related material with anyone else (in or out of the class).

Grading Policies and Procedures

As per Harris policy, grades will be distributed according to the established "Harris" curve in this class (listed in the table that follows).

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[1]As long as class is in-person as planned, these theory lectures will take place during the second half of class the week before we discuss their content. When class is remote-only (October 10th and November 16th), these theory lectures will be posted as asynchronous videos at least a week in advance of the class where we discuss their content.

[2]While class participation will not be explicitly graded, I reserve the right to amend this policy if there is not sufficient engagement with the class. This has never been a problem with Evening Master's Program (EMP) students!

[3]You should create a PDF of your slides for submission.

[4]In order to facilitate blinded grading of the slides, please be sure to omit the names of the students in your group from your slide deck, but be sure to add all group members to your submission via Gradescope's "Group Members" option.

$$\text{A} \quad \tfrac{1}{8} \quad \Big| \quad \text{A-} \quad \tfrac{1}{4} \quad \Big| \quad \text{B+} \quad \tfrac{1}{4} \quad \Big| \quad \text{B} \quad \tfrac{1}{4} \quad \Big| \quad \leq \text{B-} \quad \tfrac{1}{8}$$

Pass/Fail (P/F), Withdrawal, and Incomplete grade requests will be handled in accordance with University and Harris policy. Students who wish to take the course pass/fail rather than for a letter grade must use the Harris P/F request form (https://harris.uchicago.edu/form/pass-fail) and must meet the Harris deadline, which is generally 9am on the Monday of the 5th week of courses. To earn a P grade, students taking the course P/F must: complete and submit all assignments; take all exams; and earn a grade that is overall equivalent to at least a C- letter grade.

Materials

Textbooks

- <u>Required</u>: *Mastering 'Metrics: The Path from Cause to Effect*, 1st Edition, by Joshua D. Angrist and Jörn-Steffen Pischke (ISBN-10: 0691152845)

    - This book covers program evaluation topics in a very accessible way.
    - *Mostly Harmless Econometrics* is a more advanced text by the same authors that may be a useful companion.

- <u>Optional</u>: *Introductory Econometrics: A Modern Approach*, 6th Edition, by Jeffrey M. Wooldridge (ISBN-10: 130527010X)

    - This textbook is a great reference for regression analysis topics.
    - Previous editions are also available, are cheaper, and are close substitutes for the current edition.

In addition, we will read academic articles that are posted on Canvas.

~~Office~~ Student Hours

My (and the TA's) office hours for this class are listed on the first page of the syllabus. The intent of office hours is part of the "hidden curriculum" for some students, so I want to clarify my expectations about how students should view and approach office hours. Those hours are for you, so please make use of them! You do not need to make an appointment to see me during my office hours; just drop by (be it with questions about course material, to discuss ideas, or just to chat). I will be available during those times.

Please make your best effort to attend during the posted times, but if you have a conflict or want to talk with me one-on-one, you are welcome to make an appointment for another time. I am happy to meet with students outside of office hours.[5] You can also use the Ed Discussion discussion board (available via Canvas) to post questions, answer classmate questions, and discuss the material covered in the lectures/readings.

The EMP has its own free tutoring program that may be a useful compliment to office hours. If you are interested in tutoring, please reach out to your academic advisor for assistance in accessing this service.

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[5]I only ask that you do your best to attend the regularly scheduled office hours since I have many students and there are economies of scale in the production of knowledge. Also, if you know in advance that you cannot make a scheduled appointment, please email me to let me know.

Course Policies

General

- With the exception of two classes that will be held online due to scheduling issues at Convene, the class will be taught in-person with a remote option for students needing temporary accommodations for short-term absences. Should changing COVID-19 conditions necessitate, we will switch to holding class remotely according to University policy and my discretion. Student input will be welcomed in making this determination.

- There is no attendance requirement, but my expectation is that students will attend class in-person. Regular attendance is necessary (but not sufficient!) to do well in the class.

    - **That said, if you are experiencing COVID-19 symptoms or illness more generally, please do not attend class in person!** I will live-stream and record classes on Zoom in order to make this easier.

    - If you need a more-permanent remote learning accommodation, please contact the Dean of Students, Kate Biddle (kbiddle@uchicago.edu). Per Harris policy, all such requests can only be approved centrally, not by individual instructors.

    - More generally, if you get sick, are caring for a sick relative, or anything else that becomes an obstacle to your coursework, please inform me and Ani as soon as you are able. We will all work together to develop appropriate accommodations.

- The class webpage is available through the Canvas portal. I will use it to post announcements, assignments, and grades. Please check it regularly.

- Email, Canvas postings, and the discussion board are the official means of communication for out-of-class messaging. In other words, you are expected to check your UChicago email account and the Canvas site regularly.

- Email is inefficient. If you have a question about the class or the material, others probably do too! Questions and answers (knowledge) are public goods, so post your question to the discussion board, and feel free to answer questions your classmates ask. I'll monitor and respond as well.

- If you have a question or concern about something you don't want to discuss publicly, feel free to email me. I will respond to email within 2 business days (Monday-Friday, 9:00am-5:00pm). I teach multiple classes, so please include "Program Evaluation:" as a prefix to your subject.

- Any and all results of in-class and out-of-class assignments and examinations are data sources for research and may be used in published research. All such use will always be anonymous.

Assignments

- The goal of the assignments in this course is not just to demonstrate that you have read the articles, but to help you develop an understanding of complex concepts and associated critical thinking skills that can only come from grappling with the material (both alone and in discussion with peers). Because the use of AI tools such as large language models (LLMs) inhibits development of these skills, students are not allowed to use any such tools (e.g., ChatGPT) in this course. If you are unclear if something is an AI tool, please check with me.

- We discuss the content of the slide decks in class, so no late assignments will be accepted for any reason, valid or otherwise.[6] Not turning in an assignment, handing it in late, or failing to turn it in before the link expires will result in a grade of zero. I understand that students sometimes have legitimate reasons for being unable to complete assignments on time or give their full effort, so your lowest assignment grade will be dropped. Dropping the lowest assignment grade is intended to cover ordinary illness and other emergencies. Only long-term issues of sufficient magnitude that warrant involving the Academic and Student Affairs team in the discussion can qualify for an exception to this policy.

- No make-up exams will be given, except in rare cases of serious health problems, family emergency, or other extenuating circumstances in accordance with Harris policy. Doing so would create concerns about uneven treatment, and I can't be sure that classmates won't share information about what was on the exam. In such a case, notification and/or documentation is required in a timely manner. Whenever possible, you should contact me before the exam regarding your absence.

Recording

- I will record all lectures and post them only to Canvas in accordance with University and Family Educational Rights and Privacy Act (FERPA) guidelines.

    - The University has developed specific policies and procedures regarding the use of video/audio recordings (https://teachingremotely.uchicago.edu/recording-policy/).
    - FERPA is a federal statute that, broadly speaking, guarantees privacy over certain aspects of your educational records. You can view the details of the policy on the registrar's website (https://registrar.uchicago.edu/records/ferpa/).

- If you record a class, discussion section, office hours, or meeting without permission, or if you share any of the recorded videos without permission, you may be violating eavesdropping laws, copyright laws, or the FERPA statute. So do not post or share any such videos outside of Canvas. This also applies to any manipulated video.

Academic Integrity[7]

As a member of the Student Government Judicial Branch as an undergraduate and a graduate student at a university where any non-trivial act of lying, cheating or stealing results in expulsion, I take the Harris Academic Honesty and Plagarism Policies (https://harris.uchicago.edu/student-life/dean-of-students-office/policies) very seriously. All students suspected of academic dishonesty will be reported to the Harris Dean of Students for investigation and adjudication. The disciplinary process can result in sanctions up to and including suspension or expulsion from the University. In addition, if in my judgment, the preponderance of the evidence indicates that a student has committed an honor violation on an assignment, that student will receive an immediate grade of zero for that assignment and cannot earn a grade higher than a B- in the course, regardless of their performance on other assignments. This is regardless of the outcome of the disciplinary process. I trust every student in this course to fully comply with all of the provisions of UChicgo and Harris' integrity policies. Here are specific expectations:

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[6]Additionally, because students from advantaged social backgrounds are more likely to request extensions, granting them on an individual basis is likely to increase educational inequality.

[7]I apologize for the heavy handed tone of this section. It is intended to protect the many honest students who take my class and academic integrity as a whole.

- On exams, it is expected that you will neither receive nor give aid, nor access any material other than items explicitly outlined in the exam instructions.

- For other assignments, you may (and should!) work with other students, but it is expected that you will collaborate on all parts of the assignment (as opposed to the "divide and conquer" method).

- During the entire semester, it is expected that you will not access old problem sets, slides, exams, answer keys, student presentations, or any other class material at any time. Note that this applies both to class material obtained from other students and to class material students retaking the class may have access to. This also includes material from websites that post solutions under the guise of tutoring. (These sites both facilitate cheating and steal the intellectual property of the author.)

- During the entire semester and thereafter, it is expected that you will neither post any class material on the internet nor share any class materials with other students through any other means. Furthermore, if you become aware that this has occurred, you are obligated to let me know immediately.

Americans With Disabilities Act

Students with disabilities needing an academic accommodation should contact UChicago's Student Disability Services (SDS). Please see their webpage for contact information (https://disabilities.uchicago.edu). If SDS determines a disability accommodation is appropriate, you should inform the Harris Dean of Students office by the end of the first week of class. The Harris Dean of Students office will work with the student and instructor to coordinate the students' accommodations implementation. Harris students are not required to submit their accommodations letter to the instructor, but please feel free to come talk to me if you are comfortable doing so. I'm happy to help.

Mental Health Services

Students differ in how much they know about mental health services. Your use of UChicago's Student Health and Counseling Services (SHCS) is free, confidential, and not linked to your academic file. There is nothing to be gained from suffering in silence, so please do not hesitate to make use of the services provided by SHCS if you need them. Please see SHCS' mental health webpage for services and contact information (https://wellness.uchicago.edu/mental-health/). And if you are having serious mental, physical, or other problems, immediately contact the urgent medical care line at (773) 702-3625 (available 24 hours a day, 7 days a week).

Diversity and Inclusion

UChicago is committed to diversity and rigorous inquiry that arises from multiple perspectives, and Harris encourages thought-provoking discourse that involves not only speaking freely about all issues but also listening carefully and respectfully to the views of others. I concur with this commitment and view the diversity that students bring to my class as a valuable resource and a benefit to learning. I expect to maintain a productive learning environment based on open communication, mutual respect, and non-discrimination. I strive to present materials in a way that is respectful of diverse student backgrounds. As there can always be a gap between intent and execution, suggestions for promoting a positive and open environment are welcomed. Please feel free to correct me on your preferred name and gender pronouns if necessary.

Content notice: we will read articles about policy-relevant topics that may be difficult for some students because of their backgrounds. Understanding these papers and the implications of their findings is important for

our goal of improving policy. If you feel at any time that processing the material in this class is emotionally trying for you, first, please know that our aim is always to judge policies, not people. Second, please recognize that your experiences likely give you a unique and valuable perspective through which to evaluate the benefits and shortcomings of the research. Such diverse perspectives are sadly scarce in academia, but this makes them incredibly valuable. Finally, there are resources available to support you. You can contact your advisor, who will direct you to Harris resources, or you can email Harris' Diversity and Inclusion team (harrisdiversity@uchicago.edu). Less formally, please remember that both I and your fellow students are here to support you too, so don't hesitate to reach out.

Responsible Employees (Title IX)

All University of Chicago faculty and TAs are classified as "Responsible Employees." As such, they are required to report any discussions of sexual misconduct, dating violence, domestic violence or stalking to the Title IX Coordinator for the University. This includes the identities of the student making the complaint and alleged perpetrator. You will receive an email once a report is filed, but you are not obligated to meet with anyone or engage in the process. Alternatively, there are "Confidential Resource" employees at the University who do not have an obligation to share identifying information. For more information, including phone numbers, see the UChicago UMatter website (https://umatter.uchicago.edu/find-support/).

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Course Outline

The weekly coverage might change as it depends on the progress of the class. "PS" is an abbreviation for "Presentation Slides." Please note that our classes weeks 3 and 8 (on October 12th and November 16th) will meet online due to scheduling issues at Convene.

Course Schedule			
Week	Practice	Theory	Due
1	Introduction	"Review" of Probability and Statistics	
2	Counterfactual Outcomes & Single-Dif. Estimators	Treatment Parameters	
3	**[Online Class!]** Single-Difference Estimators	Experiments	PS 1
4	Experiments	"Review" of Regression & External Validity	PS 2
5	External Validity	Instrumental Variables (IVs)	
6	IVs	Regression Discontinuity (RD)	PS 3
7	RD	Difference-in-Differences (DD)	PS 4
8	**[Online Class!]** DD	More DD Topics	PS 5
9	More DD Topics	Class Review	PS 6

Notes: The "review" contains some material covered in DA:I and some new material. Consider it a "review/reference."

No presentation slides are due for external validity because of your "Current Topics" class that week. Please let me know if I have the dates wrong.

Readings

The following lists the readings that correspond to each section of the course. Aside from those from the Angrist and Pischke (2015) textbook, all readings will be posted on Canvas. Supplemental readings (that are not required) will be noted in the slides for those interested in further exploration of the topic.

- Week 1 - Introduction and "Review" of Probability, Statistics, & Regression

    - Practice: No reading required
    - Theory: Angrist and Pischke (2015), Appendix to Chapter 1 and Chapter 2

- Week 2 - Counterfactual Outcomes and Single-Difference Estimators & Treatment Parameters

    - Practice: Angrist and Pischke (2015), Chapter 1, pages 1-17
    - Theory: No reading required

- Week 3 - Single-Difference Estimators & Experiments

    - Practice: the Executive Summary (pages 2-8) of MVP (2010) and (all of) Pronyk et al. (2012)
    - Theory: Angrist and Pischke (2015), Chapter 1, pages 18-33

- Week 4 - Experiments & External Validity

    - Practice: Samek and Longfield (2023)
    - Theory: No required reading

- Week 5 - External Validity & IVs

    - Practice: List (2020)
    - Theory: Angrist and Pischke (2015), Chapter 3

- Week 6 - IVs & RD Designs

    - Practice: Chetty et al. (2016)
    - Theory: Angrist and Pischke (2015), Chapter 4

- Week 7 - RD Designs & DD (1)

    - Practice: Barr et al. (2022)
    - Theory: Angrist and Pischke (2015), Chapter 5, Section 5.1 & Appendix

- Week 8 - DD (1) & DD (2)

    - Practice: Chetty et al. (2009), Sections I, II & VI (skim "Placebo and Permutation Tests" in Section II & all of Section III)
    - Theory: Angrist and Pischke (2015), Chapter 5, Section 5.2

- Week 9 - DD (2) & Class Review

    - Practice: Deshpande and Li (2019)
    - Theory: No required reading

References

Barr, Andrew, Jonathan Eggleston, and Alexander A. Smith, "Investing in Infants: the Lasting Effects of Cash Transfers to New Families," *The Quarterly Journal of Economics*, 04 2022, *137* (4), 2539–2583.

Chetty, Raj, Adam Looney, and Kory Kroft, "Salience and Taxation: Theory and Evidence," *The American Economic Review*, 2009, *99* (4), 1145–1177.

__ , **Nathaniel Hendren, and Lawrence F. Katz**, "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment," *American Economic Review*, April 2016, *106* (4), 855–902.

Deshpande, Manasi and Yue Li, "Who Is Screened Out? Application Costs and the Targeting of Disability Programs," *American Economic Journal: Economic Policy*, November 2019, *11* (4), 213–48.

List, John A, "Non est Disputandum de Generalizability? A Glimpse into The External Validity Trial," Working Paper 27535, National Bureau of Economic Research July 2020.

MVP, "Harvests of Development in Rural Africa: The Millennium Villages After Three Years," Technical Report, The Earth Institute at Columbia University and Millennium Promise 2010.

Pronyk, Paul M, Maria Muniz, Ben Nemser, Marie-Andrée Somers, Lucy McClellan, Cheryl A Palm, Uyen Kim Huynh, Yanis Ben Amor, Belay Begashaw, John W McArthur, Amadou Niang, Sonia Ehrlich Sachs, Prabhjot Singh, Awash Teklehaimanot, and Jeffrey D Sachs, "The Effect of an Integrated Multisector Model for Achieving the Millennium Development Goals and Improving Child Survival in Rural sub-Saharan Africa: A Non-Randomised Controlled Assessment," *The Lancet*, 2012, *379* (9832), 2179–2188.

Samek, Anya and Chuck Longfield, "Do Thank-You Calls Increase Charitable Giving? Expert Forecasts and Field Experimental Evidence," *American Economic Journal: Applied Economics*, April 2023, *15* (2), 103–24.

Presentation Slides: Guidelines

These guidelines explain how you should prepare the content of your presentations based on the assigned readings and the details of completing/submitting the assignments.

Regarding the completion/submission details, you are welcome (and encouraged) to form study groups (of no more than 2 students) to discuss the readings with each other and create slides together. To ease TA grading responsibilities, you may submit one PDF of slides for your group, but everyone is expected to actively contribute to all parts of the slides. Please upload your presentation in PDF format via the Gradescope application on Canvas before the start of class.[8]

Regarding content, your presentations should summarize, explain, and critique how the paper(s) you read apply the given program evaluation technique(s) we cover in class. In other words, you should demonstrate your understanding of the methods we cover in lecture by discussing them in the specific context of the paper. In doing so, you should address the following six main points.[9]

- Motivation: Identify the key outcomes, interventions, and research questions studied in the paper. Explain why they are important/interesting/policy relevant.

- Data: Briefly describe the data used to estimate the model.

- Empirics & Internal Validity: Describe the empirical model and parameters to be estimated. Explain the estimation strategy and the identifying assumptions.[10] Discuss whether or not you think the authors credibly identify the parameters of interest.

- Results: Explain the results and discuss the main findings. In doing so, be sure to demonstrate that you understand and can explain how to interpret the main estimates being presented.[11]

- Robustness & External Validity: Explain whether the authors establish that their results are not particular to a narrow set of modeling assumptions (robustness). Also explain whether the authors establish that their findings are likely to be generalizable to other settings (external validity).[12]

- Critique: Critique the analysis. Discuss the strengths and weaknesses. State whether you would be comfortable making policy based on the study. If so, explain why. If not, explain what you would recommend the authors do to make the study more convincing.

Your presentations should be aimed at intelligent individuals who are interested in the policy being evaluated, but who don't necessarily have a background in statistics, econometrics, or policy evaluation. In other words, you should be sure to explain all technical/statistical concepts in your own words.

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[8]In order to facilitate blinded grading of the slides, please be sure to omit the names of the students in your group from your slide deck, but be sure to add all group members to your submission via Gradescope's "Group Members" option.

[9]While your presentations do not need to address these points in order or explicitly label each slide (e.g., slide titles of "Motivation," "Data", etc.), please tag the sections in Gradescope to facilitate grading.

[10]The empirical model is the model of how the data is generated (e.g., a linear regression model). The estimation strategy is how you recover an estimate of the (usually causal) parameter you're interested in for policy reasons (e.g., difference-in-differences). Internal validity is the extent to which the evidence provided by a particular study establishes cause and effect. Internal validity is often discussed in terms of the identification of a parameter (whether the estimator you construct and data you use actually recover or "identify" the parameter you want). This generally requires evaluating whether a set of identifying assumptions are met in the particular context.

As part of addressing this point, it may be helpful to contrast the authors' approach with a "naive" analog and explain why such an approach would be problematic.

[11]You do not need to do this for every estimate or set of estimates! Instead, pick the main or a representative estimate from the tables/figures and say what that number means.

[12]External validity is the extent to which conclusions from a particular study can be applied in other contexts (that might include different samples, individuals, locations, situations, interventions, and/or time periods).

Please note that there are no slide or word count limitations, so you can address each point in as much or as little detail as you want. With that said, you should feel free to be concise. I'm asking you to create presentations for a reason. I'm not expecting you to write an essay and paste a paragraph on each slide. Be complete, but succinct. You may also feel free to include tables, figures, and other visuals from the readings (or anywhere else that's useful), but be sure to explain what they tell us.