

PS 200E: Experimental Design for Social Science
Spring 2024

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OH: Tuesday 1:00 - 2:00 PM
or by appointment (Bunche 3288)

Class sessions:
TTh 11-12:15p in Bunche Hall 4357 (4th floor)

Course overview

This course covers the design, implementation, and analysis of experiments in the social sciences. The focus is on field experiments, but the core ideas will also apply to lab, survey, online, and lab-in-the-field experiments. The course methodically covers the basics, with the goal of giving you the tools to learn about more advanced designs and analysis procedures when needed.

Learning objectives

- Estimating average causal effects using randomized experiments
- Characterizing uncertainty and conducting hypothesis tests about the estimates
- Assessing the quality of an experimental design in terms of researcher goals, and navigating tradeoffs between different goals
- Mitigating the risks of bias (and carefully presenting results when bias is possible)
- Improving efficiency or statistical power
- Estimating whether average effects vary by individual or subgroup
- Estimating multiple causal effects in one experiment
- Strategies for funding and running a field experiment as a graduate student
- Implementing key parts of experimental design and analysis in code

How we will meet these goals

There is growing evidence (from randomized experiments!) that live lectures are ineffective learning tools for many students. Instead, you will learn in this course primarily by doing. The first component is activities in a group, in class, with instructor support. The content of the activities will vary. Some will involve conducting a random assignment, replicating results from a published study, or running a simulation. The second component is problems you do with less help, on your own, in a group outside of class. Both are important to learning and reinforcing what you learn. To prepare for both, you will read a combination of methodological texts and published experiments and sometimes watch a short video. We will do a review quiz at the start of every class to help you assess your learning and resolve common misunderstandings through a short Q&A session.

Assignments

I have included approximate grade breakdowns to help guide your thinking about the importance of different assignments.

1. *Quizzes on readings (~15%)*. Each week, readings from textbooks and other methodological sources are assigned, along with one or more “applications” that will be used in group activities. A short quiz (2-3 questions) on these readings will start each class. This is not meant to evaluate you but rather help you assess your understanding so you can ask questions and follow up if needed.

2. *Groupwork (~50%)*. Students are generally expected to attend each class session and participate in group work during the class. The group will upload their completed RMarkdown document by the following Sunday night at 5 p.m. We will post solutions at that time.

3. *Problem sets (~35%)*. There will be several problem sets, drawing on problems from the Gerber and Green textbook (note they will be difficult or impossible to complete if you have not read the relevant chapter!).

- You can (and should!) Google, read Stack Overflow, use ChatGPT, and seek out online resources for help. You can copy-paste code from these resources, just remember to comment your code with the URL where you got it from (this is good practice too, in order to remember where you got it!). If you use ChatGPT, please comment with the prompt you used. Grabbing code from these resources is a key part of how social scientists do data analysis. How you use it — and whether you use it correctly — is up to you though.
- Work in groups is encouraged, but you must note the name of each person you collaborated with for each question. Failure to do so will be treated as a violation of the plagiarism policy.

In addition, most sessions include optional lecture videos from a past year’s class. I strongly encourage you to watch these videos if you are struggling with the textbook.

(Self-)evaluation¹

There is little high-quality evidence that grading assignments and exams helps students learn, and some evidence that grading is harmful. Instead, you will evaluate yourself at several points during the quarter in terms of your effort and your learning. In addition, you will *evaluate each other* within your groups.

Your own evaluation, and the evaluation of you by your peers, will form the basis of your final grade. You will be provided with your peer evaluations at each point, and you will decide how to incorporate those into your evaluation. I reserve the right to change your grade, up or down, at the end of the quarter if I do not agree with your self-assessment (I will rely on the approximate

¹ I draw on [Jessica Calarco](#) and [Jesse Stommel](#)’s ideas on “ungrading.”

breakdowns listed in the assignment section in making my own assessment). If I do decide to make a change, I will meet with you to talk about your performance before making a decision.

Auditing: in my experience, auditing a class like this without completing the assignments will not be productive for you, so auditors will not be permitted. I encourage you to take the course for credit!

Getting help

This course is a lot of work! The group work and problem sets are motivated by the idea that the most effective way to learn this material is to do it yourself. This means if you get behind, it will be hard to catch up. We don't want this to happen!

We encourage you to take advantage *early and often* of three resources: Graeme's office hours, Doeun's office hours, and the Canvas discussion board. We are here to help, and want everyone to succeed in the course.

The discussion board allows all students to benefit from the discussion and to help each other understand the materials. Both students and instructors are encouraged to participate in discussions and answer any questions that are posted. You should operate on the principle "if I have a question, everyone else is unsure too."

Prerequisites

This course assumes familiarity with the statistics at the level of Political Science 200C (Causal Inference for Social Science), which may be met through courses in some other disciplines. Students who did not take the methods sequence in political science can contact me before enrolling in the course to discuss their preparation.

Computation

The course assumes intermediate familiarity with the R statistical environment and involves substantial use of R in most class sessions. Problem sets must be completed using R and Quarto/RMarkdown. You should be familiar with the *tidyverse* family of R packages, with writing functions, with loops, with data transformation using *dplyr*, and with visualizing data with *ggplot*. If you know R but not the *tidyverse*, I provide resources below to pick them up before class starts. If you have not used R in a course before, it will be very difficult for you to succeed in the course, so please contact me in advance before registering for the class.

Students outside political science

You are very welcome to take the class if you are not in political science!

Students from Anderson, education, sociology, social welfare, and statistics have taken the course and succeeded. Some of these students found it helpful to first take earlier parts of the political science methods sequence (PS 200A and 200B and in some cases 200C). Others found that their own methods training was sufficient. I am happy to talk to you about your preparation. *The biggest barrier to success in the course seems to be experience with R* (see above). Advanced undergraduates may take the course with permission from the instructor, but only if they have taken PS 200A-200C.

Professional ethics

You are subject in this class to UCLA's [academic honesty policies](#). You should not pass off others' work, words, or code as your own (you can avoid this by liberally citing and when relevant including quotation marks or notes indicating what is directly taken from others; our greatest virtue is building off the past work of others). Data fabrication in the context of the group experiment would violate the policy. If you have questions about the attribution of work or whether practices in the experiment violate the policy, get in touch with us to talk about it.

Readings and resources

Research design and implementation:

- Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton. Abbreviation: FEDAI.
- Blair, Graeme, Alexander Coppock, and Macartan Humphreys. [Research Design: Declare, Diagnose, Redesign](#). 2023, Princeton UP. Abbreviation: RDSS.
- Glennerster, Rachel, and Kudzai Takavarasha. 2013. *Running Randomized Evaluations: A Practical Guide*. Princeton UP. Abbreviation: RRE. (See also [JPAL's research resources](#).)

Additional resources you may find useful:

- Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura B. Rawlings, Christel M. J. Vermeersch. [Impact Evaluation in Practice](#). World Bank. (Free PDF.)
- Glewwe, Paul and Todd, Petra. [Impact Evaluation in International Development: Theory, Methods and Practice](#). World Bank. (Free PDF.)
- Druckman, James, and Donald P. Green. 2021. *Handbook of Experimental Political Science*. Cambridge UP.
- Banerjee, Abhijit Vinayak, and Esther Duflo. 2017. *Handbook of Economic Field Experiments*. North-Holland.
- Thompson, Steven K. 2012. *Sampling*. Wiley. Third ed.
- Karlan, Dean, and Jacob Appel. 2017. *Failing in the Field: What We Can Learn When Field Research Goes Wrong*. Princeton UP.
- Sriram, Chandra Lekha, John C. King, Julie A. Mertus, Olga Martin-Ortega, Johanna Herman. 2009. *Surviving Field Research: Working in Violent and Difficult Situations*.
- Krause, Peter, and Ora Szekeley, eds. 2020. *Stories from the Field: A Guide to Navigating Fieldwork in Political Science*. Columbia UP.

- Kapiszewski, Diana, Lauren M. MacLean, and Benjamin L. Read. 2015. *Field research in political science: Practices and Principles*. Cambridge UP.

Software:

- Golemund, Garrett and Hadley Wickham. [R 4 Data Science](#). (Free Web book.)
- [Computational Social Science Bootcamp](#)
- [tidyverse cheat sheets](#)
- [Compilation of R tutorials and resources](#)
- [RStudio R primers](#)
- Useful software packages for experiments in R:
 - randomizr: easy-to-use common randomization schemes
 - estimatr: design-based estimators for experiments
 - blockTools: for constructing blocks/strata for block-randomized experiments
 - ri2: for conducting randomization inference

Schedule

Before the start of each week, I will announce the readings and plan for the week, and you can find them under “Modules” in Canvas. The readings are available several weeks in advance on Canvas.

<u>Week</u>	<u>Day</u>	<u>Section</u>	<u>Topic</u>	<u>Learning goals</u>
1	Tue	Causal inference review		Potential outcomes, individual causal effects, FPCI, average causal effects, difference between potential outcomes and revealed outcomes, other functions than average of potential outcomes
	Thu	Defining goals		MIDA framework, estimand/estimator/estimate distinction, diagnosands (bias, power, minimum detectable effects - MDE, root mean squared error - RMSE, ethics), UTOS
2	Tue	Base case: Balanced (50-50) two-arm trials with complete random assignment	Random assignment	Complete random assignment, relation to simple random assignment, switching equation

	Thu		Identification and estimation	Assumptions (stable unit treatment value assumption or SUTVA), random assignment), difference-in-means estimator, equivalence with OLS regression
3	Tue		Uncertainty expression	Sandwich standard errors, confidence interval refresher, relationship to testing, relation to MDE
	Thu		Hypothesis testing	Randomization inference, multiple comparisons
4	Tue	Research ethics		Beneficence, respect for persons, justice, consent, positionality, group rights, red lines, ex-ante assessment, secondary harm (research staff)
	Thu	Design diagnosis		Monte Carlo simulation
5	Tue	Reducing bias	Randomization verification	Verifying treatment assignment, balance tests, balance test fallacy
	Thu		Excludability	
6	Tue		Noncompliance	Noncompliance potential outcomes, complier average causal effect (CACE) estimand
	Thu		Attrition	Attrition potential outcomes, bounds
7	Tue		Interference	Interference potential outcomes, stable potential outcomes
	Thu		External validity	External validity (T-, C-), construct validity (Y-)
8	Tue	Improving power	Controls (lin)	Regression with controls, Lin regression
	Thu		Blocking	Random assignment, identification and estimation, uncertainty expression, hypothesis testing
9	Tue		Indices	TBD
	Thu	Heterogeneous effects	Testing, discovery, subgroup effects	TBD
10	Tue	Multiple treatments	3+-arm trials, factorial, adaptive	TBD
	Thu	Implementation	Field experiments on a shoestring, working with partners	TBD

Addendum: Experiments at UCLA

Selected recent experiments by UCLA faculty

UCLA is a hub of experimentation across the social sciences. Below is a list of recent experiments by faculty, who may be useful resources as you begin to think about running your own experiments.

- [Darin Christensen](#) (Public policy and political science)
 - [Building Resilient Health Systems: Experimental Evidence from Sierra Leone and the 2014 Ebola Outbreak](#), working paper
 - [Community-Based Crisis Response: Evidence from Sierra Leone's Ebola Outbreak](#), *AEA Papers and Proceedings*
- [Cesi Cruz](#) (Political science)
 - [Buying Informed Voters: New Effects of Information on Voters and Candidates](#), working paper
 - [Making policies matter: Voter responses to campaign promises](#), working paper
- [Magali Delmas](#) (Anderson and Institute of the Environment and Sustainability)
 - [Information strategies for energy conservation: A field experiment in India](#), *Energy Economics*
 - [What Can We Learn from High Frequency Appliance Level Energy Metering? Results from a Field Experiment](#), *Energy Policy*
- [Michael Gaddis](#) (Sociology)
 - [Finding a Roommate on Craigslist: Racial Discrimination and Residential Segregation](#) (working paper)
 - [Arab American Housing Discrimination, Ethnic Competition, and the Contact Hypothesis](#), *The Annals of the American Academy of Political and Social Science*
- [Jana Gallus](#) (Anderson)
 - [Fostering public good contributions with symbolic awards: A large-scale natural field experiment at Wikipedia](#), *Management Science*
 - [Recognition Incentives for Internal Crowdsourcing: A Field Experiment at NASA](#), working paper
- [Chad Hazlett](#) (Political science and statistics)
 - [Kernel Balancing: A flexible non-parametric weighting procedure for estimating causal effects](#), *Statistica Sinica*
 - [A Persuasive Peace: Syrian refugees' attitudes towards compromise and civil war termination](#), *Journal of Peace Research*
- [Salma Mousa](#) (Political science)
 - ["Building social cohesion between Christians and Muslims through soccer in post-ISIS Iraq."](#) *Science*.
 - ["The Gender \(Dis\)Trust Gap: Evidence from a Global Field Experiment."](#) (with Saad Gulzar). Working paper.
- [Efrén Pérez](#) (Political science and psychology)

- [Does Perceiving Discrimination Influence Partisanship among Immigrant Minorities? Evidence from Five Experiments](#), *Journal of Experimental Political Science*
- [“Language influences mass opinion toward gender and LGBT equality,”](#) *Proceedings of the National Academy of Science*
- [Dan Posner](#) (Political science)
 - [The Weakness of Bottom-Up Accountability: Experimental Evidence from the Ugandan Health Sector](#), working paper
 - [Why Does Ethnic Diversity Undermine Public Goods Provision?](#) *American Political Science Review*
- [Natasha Quadlin](#) (Sociology)
 - [Americans’ Perceptions of Transgender People’s Sex: Evidence from a National Survey Experiment](#), *Socius: Sociological Research for a Dynamic World*
 - [Sibling Achievement, Sibling Gender, and Beliefs about Parental Investment: Evidence from a National Survey Experiment](#), *Social Forces*
- [Lynn Vavreck](#) (Political science)
 - [Persuasive Effects of Presidential Campaign Advertising: Results of 53 Real-time Experiments in 2016](#), *Science Advances*
 - [Does Product Placement Change Television Viewers’ Social Behavior?](#) *Plos ONE*
- [Sherry Wu](#) (Anderson)
 - [Having a voice in your group: Increasing productivity through group influence](#), working paper
 - [Participatory practices at work change attitudes and behavior toward societal authority and justice](#), *Nature Communications*

Experiments by UCLA political science Ph.D. graduates (UCLA PhD)*

Many UCLA Ph.D.s have conducted experiments during graduate school. Below is a probably incomplete list of these experiments with links to their Web sites so you can see how these experiments fit into their research portfolio. (Let me know if you know of one that is missing.)

- [Ryan Enos](#) (Harvard)*. 2014 [“Causal Effect of intergroup contact on exclusionary attitudes.”](#) *Proceedings of the National Academy of Sciences*.
- [Ryan Enos](#) (Harvard)* and Anthony Fowler. 2014. [“Pivotality and Turnout: Evidence from a Field Experiment in the Aftermath of a Tied Election.”](#) *Political Science Research and Methods*.
- [John McCauley](#). [“Pentecostalism as an informal political institution: Experimental evidence from Ghana.”](#) *Politics and Religion* 7.4 (2014): 761-787.
- [John McCauley](#). [“Measuring and Reducing Religious Bias in Post-Conflict Zones: Evidence from Côte D’Ivoire.”](#) *Political Psychology* 35.2 (2014): 267-289.
- [Jessica Preece](#) (BYU)* and Olga Bogach Stoddard. 2015. [“Does the Message Matter? A Field Experiment on Political Party Recruitment.”](#) *Journal of Experimental Political Science*.

- Christopher F. Karpowitz, J. Quin Monson, and [Jessica Robinson Preece](#) (BYU)*. 2017. "[How to Elect More Women: Gender and Candidate Success in a Field Experiment.](#)" *American Journal of Political Science*.
- [Joseph Asunka](#) (Hewlett Foundation)*, [Sarah Brierley](#) (LSE)*, Miriam Golden (former UCLA faculty), [Eric Kramon](#) (George Washington)*, and [George Ofori](#) (LSE)*. 2017. "[Electoral Fraud or Violence: The Effect of Observers on Party Manipulation Strategies.](#)" *British Journal of Political Science*.
- Claire Adida, Jessica Gottlieb, [Eric Kramon](#) (George Washington)*, and Gwyneth McClendon. 2017. "[Reducing or Reinforcing In-Group Preferences? An Experiment on Information and Ethnic Voting](#)", *Quarterly Journal of Political Science*.
- [Ryan Enos](#) (Harvard)*. 2017. *The Space Between Us: Social Geography and Politics*. Cambridge UP. Reports on field experiments Ryan conducted for his dissertation.
- Panagopoulos, Costas, Jan E. Leighley, and [Brian T. Hamel](#). "[Are voters mobilized by a 'friend-and-neighbor' on the ballot? Evidence from a field experiment.](#)" *Political Behavior* 39.4 (2017): 865-882.
- [Ryan Enos](#) and Noam Gidron. "[Exclusion and cooperation in diverse societies: Experimental evidence from Israel.](#)" *American Political Science Review* 112.4 (2018): 742-757.
- [Sarah Brierley](#) (LSE)*, [Eric Kramon](#) (George Washington)*, and [George Kwaku Ofori](#) (LSE)*. 2019. "[The Moderating Effect of Debates on Political Attitudes.](#)" *American Journal of Political Science*.
- [George Kwaku Ofori](#) (LSE). 2019. "[Do Fairer Elections Increase the Responsiveness of Politicians?](#)" *American Political Science Review*.
- Claire Adida, Jessica Gottlieb, [Eric Kramon](#) (George Washington)*, and Gwyneth McClendon. 2019. "[When Does Information Influence Voters? The Joint Importance of Salience and Coordination.](#)" *Comparative Political Studies*.
- Thad Dunning, Guy Grossman, Macartan Humphreys, Susan D. Hyde, Craig McIntosh, Gareth Nellis, Claire L. Adida, Eric Arias, Clara Bicalho, Taylor C. Boas, Mark T. Buntaine, Simon Chauchard, Anirvan Chowdhury, Jessica Gottlieb, F. Daniel Hidalgo, Marcus Holmlund, Ryan Jablonski, [Eric Kramon](#) (George Washington)*, Horacio Larreguy, Malte Lierl, John Marshall, Gwyneth McClendon, Marcus A. Melo, Daniel L. Nielson, Paula M. Pickering, Melina R. Platas, Pablo Querubín, Pia Raffler, and Neelanjan Sircar. 2019. "[Voter Information Campaigns and Political Accountability: Cumulative Findings from a Pre-registered Meta-analysis of Coordinated Trials.](#)" *Science Advances*.
- [Elizabeth Carlson](#)* (Penn State) and Brigitte Seim. 2020. "[Honor among Chiefs: An Experiment on Monitoring and Diversion Among Traditional Leaders in Malawi.](#)" *Journal of Development Studies*.
- Atkeson, Lonna Rae, and [Brian T. Hamel](#)*. "[Fit for the job: Candidate qualifications and vote choice in low information elections.](#)" *Political Behavior* 42.1 (2020): 59-82.
- Graeme Blair, Rebecca Littman, Elizabeth R. Nugent, Rebecca Wolfe, Mohammed Bukar, Benjamin Crisman, Anthony Etim, Chad Hazlett, and Jiyoung Kim*. 2021. "[Trusted Authorities Can Change Minds and Shift Norms During Conflict.](#)" *Proceedings of the National Academy of Sciences*.

- [Ashley Blum](#)*, Chad Hazlett, and Daniel N. Posner. 2021. "[Measuring Ethnic Bias: Can Misattribution-Based Tools from Social Psychology Reveal Group Biases that Economics Games Cannot?](#)" *Political Analysis*.
- Efrén O. Pérez, Alisson Ramos, and [Bianca V. Vicuña](#)*. 2022. "[Does Affirming Black and Latino People as American Weaken Racial Solidarity? A Surprising "No" from Two Pre-registered Experiments.](#)" *Research & Politics*.
- Efrén O. Pérez, [Crystal Robertson](#)*, and [Bianca V. Vicuña](#)*. 2022. "[Prejudiced When Climbing Up or When Falling Down? Why Some People of Color Express Anti-Black Racism.](#)" *American Political Science Review*.
- [Gregory John Leslie](#), Tye Rush, Jonathan E. Collins, and Matt Barreto. 2023. "[Perceived Racial Efficacy and Voter Engagement Among African-Americans.](#)" *Politics, Groups, and Identities*.