The Logic of Randomized Experiments in Political Science

Spring 2022

Professor:	Alexander Coppock	**Class Time:**	MW 10:30 - 11:20
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TF:	Shikhar Singh	**Lab Time:**	F 10:30 - 11:20 and F 11:25 - 12:25
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Objectives

Randomized experiments have become an indispensable tools for businesses, nonprofits, and social scientists for assessing causal effects. Companies like Facebook and OKCupid subject nearly every element of their interfaces to intense testing via randomized experimentation in order to optimize engagement. Political organizations randomize the type and frequency of voter contacts in order to maximize their chances of electoral and legislative success. Social scientists use the results of randomized experiments to develop and test theories of human behavior.

At the end of this course, all students will be able to design, execute, and analyze randomized experiments. The goal is to enable students to evaluate the impact of real-world interventions on well-defined political, economic, and social outcomes. We will cover field experiments exclusively, though nearly all of the design and analysis principles will extend to survey, lab, and so-called "natural" experiments. While some research methods classes (rightly) cover a wide variety of research tools, this course will focus narrowly on the strengths and weaknesses of a single method: randomized field experimentation.

Eligibility

This course is taught at an undergraduate level. In years past, I have offered a PhD-level version of the course (PLSC 512), but I am not doing so this year. As a result, I anticipate that more graduate students will take the course than usual. In the second half of the course, students enrolled in the PLSC 537 will cover some extra material and complete a few extra problmes.

Prerequisites

The only prerequisites is any introductory probability or statistics course. If you have conducted a formal hypothesis test of any kind, you are probably prepared for this course. We will not be using any mathematics (with one exception) more complicated than addition, subtraction, multiplication, and division, though we will be doing those operations frequently – and in combination!

Course Pages

We will use our canvas.yale.edu page. Readings will be distributed on canvas and all assignments will be submitted via canvas.

Office Hours

My office hours will be held on Mondays from 1:20pm to 4:20pm in RKZ 135. Sign up via calendly: https://calendly.com/acoppock. If all slots are taken, please email me for a time, I'm **always** happy to meet and it is an expectation that we will meet at least once or twice over the course of the semester.

Our TA, Shikhar Singh will also hold office hours on Tuesdays from 2-4pm in RKZ 204. Sign up via calendly, https://calendly.com/shikhar-singh/experiments. If these hours don't work for you, email for an appointment.

Textbook:

Gerber, Alan and Green, Donald P. *Field Experiments: Design, Analysis, and Interpretation*, W.W. Norton, 2012. FEDAI will serve as our main textbook and source of weekly problem sets. We will read Chapters 1-5 and 9 over the course of the term. Copies are available at the bookstore.

Software:

We will be using the open-source statistical software `R`. In addition to `R`, please also download and install RStudio, which is the software we'll use to write and edit scripts.

- Download `R` here: www.r-project.org
- Download RStudio here: www.rstudio.org

Workload:

This course will involve a relatively heavy workload, and students considering enrolling should be aware that maintaining a high grade in this class will require sustained, serious effort all throughout the term. Your effort will be divided among three ongoing tasks:

- Weekly problem sets (5-8 hours a week)
- Weekly readings from the textbook FEDAI (1 hour a week)
- Weekly experimental articles. (2 hours a week, to be discussed in class)

In addition to these ongoing tasks, this course will feature **two exams** and a **final project**. The exams will be **easy** for you if you keep up with the problem sets. The final project is a practice experiment in which you will design, conduct, and analyze a randomized experiment. This project is typically a blast and I expect that you will have a great time doing it.

Grading Policy:

Problem Sets (50%), Midterm Exam (10%), Final Exam (10%), Final Project (30%).

Problem Sets Policy:

All students must write up their problem sets individually. However, you may work in groups of up to three, though you are not required to work in groups at all. Please indicate at the top of your homework the names of the other students you worked with that week. Do not "share" members across groups. Do not copy and paste the answers across group members.

Academic Honesty:

To ensure that you do not accidently violate Yale's academic honesty policies, please review these sites:

- Academic Honesty: http://bit.ly/2a6uTC5
- Understanding and Avoiding Plagiarism: http://bit.ly/29VnoN1

I would like to emphasize that it is a violation of the honesty policy to:

- Copy another student's problem set, just changing a few words here and there. Collaboration is encouraged, but at some point relying too much on your partner becomes a violation of academic integrity. Most cases are clear-cut; for cases that are ambiguous, ask.
- Copy and paste whole blocks of code from your partner that you didn't have a hand in writing.
- Copy whole sentences from the internet.

It is *not* a violation of the honesty policy to:

- Copy code from websites like stackoverflow or other online forums. This is not cheating, it's learning. Part of what makes it learning is that understanding code off the internet well enough to use it usually means that you at least sort of understand it. If you do copy such code, please include a link to the forum or site where you obtained the code in the comments. This is good practice anyway, as you will often forget where code came from!
- Discuss the problem sets with your partners and compare answers.
- Read others' final projects and offer/receive advice.

Course Outline, subject to change

Week 1

Wednesday, January 26, 2022

- No readings
- Lecture: the goals of randomized experimentation

Friday, January 28, 2022

- Assignment: Install R (www.r-project.org), Rstudio (www.rstudio.com), and ensure that you can type `2+2` into the console and get back `4`.
- Assignment: Problem set 1 assigned
- Reading for understanding: FEDAI chapter 1
- Reading for discussion: Page (1998)

Week 2

Monday, January 31, 2022

- Reading for understanding: FEDAI chapter 2
- Lecture: Potential outcomes and the ATE

Wednesday, February 2, 2022

- Reading for discussion: Gerber et al. (2008)
- Assignment: Problem set 1 due
- Assignment: Problem set 2 assigned

Week 3

Monday, February 7, 2022

- Reading for understanding: FEDAI chapter 3
- Lecture: Estimation and sampling distributions

Wednesday, February 9, 2022

- Reading for discussion: Ashraf et al. (2010)
- Assignment: Problem set 2 due
- Assignment: Problem set 3 assigned

Week 4

Monday, February 14, 2022

- Reading for understanding: FEDAI chapter 3
- Lecture: Hypothesis testing via randomization inference

Wednesday, February 16, 2022

- Assignment: Problem set 3 due
- Assignment: Problem set 4 assigned
- Reading for discussion: Kalla and Broockman (2015)

Week 5

Monday, February 21, 2022

- Reading for understanding: FEDAI chapter 3
- Lecture: Blocking

Wednesday, February 23, 2022

- Reading for discussion: Bertrand and Mullainathan (2004)
- Assignment: Problem set 4 due
- Assignment: Problem set 5 assigned

Week 6

Monday, February 28, 2022

- Reading for understanding: FEDAI chapter 3
- Lecture: Clustering
- Reading for discussion: Mousa (2020)

Wednesday, March 2, 2022

- Reading for understanding: Blair et al. (2021, Chapter 2) Available here `https://book.declaredesign.org/what-is-a-research-design.html`
- Lecture: Simulating research designs
- Assignment: Assignment 5 due
- Assignment: Problem set 6 assigned
- Assignment: Proposal for practice experiment assigned

Week 7

Monday, March 7, 2022

- Reading: FEDAI: Chapter 4

Wednesday, March 9, 2022

- Reading for discussion: Balcells et al. (2022)
- Assignment: Problem set 6 due
- Assignment: Proposal for practice experiment due
- Assignment: Preanalysis plan for practice experiment (with simulated data and analysis) assigned

Week 8

Monday, March 14, 2022

- In class review session for exam

Wednesday, March 16,

- In class exam

Spring Break

Monday, March 21, 2022

- No Class

Wednesday, March 23, 2022

- No Class

Week 9

Monday, March 28, 2022

- Reading for understanding: FEDAI chapter 9

Wednesday, March 30, 2022

- Reading for discussion: (Choi et al., 2022)
- Assignment: Preanalysis plan for practice experiment (with simulated data and analysis) due
- Assignment: Problem set 7 assigned

Week 10

Monday, April 4, 2022

- Reading: FEDAI chapter 5
- Lecture: One-sided noncompliance

Wednesday, April 6, 2022

- Assignment: Problem set 7 due
- Assignment: Problem set 8 assigned
- Reading: Gerber and Green (2000)
- Reading: McClendon (2014)
- Reminder: make sure to set your experimental plans in motion!

Week 11

Monday, April 11, 2022

- Assignment: Problem set 8 due
- Lecture: Placebo control

Wednesday, April 13, 2022

- Reading for discussion: Karpowitz et al. (2017)
- Reading for discussion: Broockman and Kalla (2016)
- Reminder: make sure you plan to complete your experiment with enough time to analyze the data and make a nice presentation for Monday the 18th.

Week 12

Monday, April 18, 2022

- Share Practice experiments in class

Wednesday, April 20, 2022

- Share Practice experiments in class

Week 13

Monday, April 25, 2022

- In-class review session

Wednesday, April 27, 2021

- In-class final exam

Exam week

Monday, May 9, 2022

- Practice experiment write up due at 2pm (our university-mandated exam time)

References

Ashraf, Nava, James Berry and Jesse M. Shapiro. 2010. "Can Higher Prices Stimulate Product Use? Evidence from a Field Experiment in Zambia." *American Economic Review* 100(December):2383–2413. 4

Balcells, Laia, Valeria Palanza and Elsa Voytas. 2022. "Do Transitional Justice Museums Persuade Visitors? Evidence from a Field Experiment." *The Journal of Politics* . 6

Bertrand, Marianne and Sendhil Mullainathan. 2004. "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination." *The American Economic Review* 94(4):991–1013. 5

Blair, Graeme, Alexander Coppock and Macartan Humphreys. 2021. *Research Design: Declare, Diagnose, Redesign*. Princeton, NJ: Princeton University Press. Under advance contract. 5

Broockman, David E. and Joshua Kalla. 2016. "Durably Reducing Transphobia: A Field Experiment on Door-to-door Canvassing." *Science* 352(6282):220–224. 7

Choi, Donghyun Danny, Mathias Poertner and Nicholas Sambanis. 2022. "The Hijab Penalty: Feminist Backlash to Muslim Immigrants." *American Journal of Political Science* . 6

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Gerber, Alan S., Donald P. Green and Christopher W. Larimer. 2008. "Social Pressure and Voter Turnout: Evidence from a Large-Scale Field Experiment." *American Political Science Review* 102(01):33–48. 4

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McClendon, Gwyneth H. 2014. "Social Esteem and Participation in Contentious Politics: A Field Experiment at an LGBT Pride Rally." *American Journal of Political Science* 58(2):279–290. 7

Mousa, Salma. 2020. "Building social cohesion between Christians and Muslims through soccer in post-ISIS Iraq." *Science* 369(6505):866–870. 5

Page, Stewart. 1998. "Accepting the Gay Person: Rental Accommodation in the Community." *Journal of Homosexuality* 36(2):31–39. 4