# The Design and Analysis of Randomized Field Experiments in Political Science

Spring 2017

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| **Professor:** | Alexander Coppock | **Class Time:** | MW 9:00 - 10:15 am |
| **Email:** | alex.coppock@yale.edu | **Class Place:** | TBA |
| **TF:** | Shikhar Singh | **Lab Time:** | TBA |
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**Objectives:** Randomized field experiments are deployed across the social sciences to answer well-posed theoretical questions and to generate new information from which to build fresh theories of social interaction and behavior. Experiments are attractive because they enable the researcher to (mostly) ground statistical and causal inferences in features of the research design rather than assumptions about the world. This graduate-level course will cover the design and analysis of both introductory and advanced experimental designs, using the textbook by Gerber and Green (2012) as our main guide. Strong emphasis will be placed on developing practical skills for real research scenarios. Given resources, how should subjects be assigned to conditions? How many treatment arms should we include? How do we plan to analyze the resulting data? This course will feature a relatively heavy workload: weekly problem sets in R that (I promise) will prepare students for 95% of experimental research tasks they will encounter in the field.

**Eligibility:** This course is taught at a graduate level. I am also teaching a similar course at an undergraduate level this spring, PLSC 341. Doctoral students may not enroll in the undergraduate level course. Students (doctoral or otherwise) may not audit the class, mostly because I think that without struggling with the problem sets, relatively little is gained from sitting in lecture.

**Prerequisites:** The only pre-requisite is any course covering (at any level of detail) linear regression. We will build the statistical foundations for randomized experiments from the ground up, so there is relatively little assumed knowledge.

**Lab Section:** Shikhar Singh will lead a weekly lab section to teach the computational skills needed to complete the problem sets. These lab sections are mandatory and will be scheduled at a time that is convenient to all. Because assignments will be due Mondays, it would probably be best if these labs met late Thursdays or midmorning Fridays to provide people with adequate time to work out the problem sets.

**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:** I will hold office hours from 10:30 to 12:00 on Monday and Wednesday mornings in room D233 of ISPS (77 Prospect Street). My office is at the top of a maze, so plan to spend a few extra minutes finding it the first time you come by. I am also happy to meet outside of office hours (mornings are best). Please email me to set up times that are mutually convenient. It would be weird and probably a bad sign if we never met during office hours over the course of term, so please come early and often.

**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 the entire book over the course of the term and will do (almost) every exercise. Copies are available at the

bookstore or on Amazon.com. Please do purchase a physical copy for yourself rather than using a library copy or sharing, as it is A) a fantastic reference and B) a course requirement.

**Software:** We will be using the open-source statistical software `R`. While other statistical software pacakges such as SPSS, Stata, or even Excel can of course be used for experimental analysis, `R` has many advantages. First, (with apologies to Python) it is the programming language of choice of many (most?) data scientists and statisticians. Second, it makes writing loops and functions very easy, tasks that are nearly impossible in Excel. Third, there is a large community of developers who have contributed a huge number of add-ons for `R` that you will find invaluable. Finally, it's free, and always will be, which is not true of other software. In addition to `R`, please also download and install RStudio, the top-of-the-line script editor.

- 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 directed towards:

- Weekly problem sets (15-20 hours a week)
- Weekly readings from the textbook FEDAI (1 hour a week)
- Occassional experimental articles. (1 hour a week)

In addition to these ongoing tasks, this course will feature a **midterm exam** and **two projects**. The exam will be **easy** and is worth the same number of points as a problem set. The first project is a "practicum" 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. We'll hold a poster session so you can share the results of your experiments with each other and my undergraduate class. The second project is a replication/reanalysis of an existing experimental article. This project sometimes leads to published papers.

I **strongly encourage** you to use rmarkdown or LaTeXwith knitr to prepare your problem sets. Shikhar and I will be on hand to assist you in getting this set up. It's best to practice using these tools now on something low stakes like problem sets rather than when you're writing your dissertation or finalizing an article for submission to a journal. If you choose not to use these excellent tools, you must attach your code to your finished problem sets so that we can see exactly what you did!

**Grading Policy:** Problem Sets (plus midterm) (60%), Practicum Experiment (20%), Replication Project (20%).

**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.

**Class Policy:**

- Regular attendance is essential and expected.

**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:**

Wednesday, January 17

- No readings

Friday, January 19 *Special make up class

- Reading: FEDAI Chapter 1
- Reading: Page (1998)
- 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`.

Monday, January 22

- Reading: FEDAI Chapter 2
- Assignment: FEDAI Chapter 1 Problem Set Due

Wednesday, January 24

- Reading: Kalla and Broockman (2015)

Monday, January 29

- Reading: FEDAI Chapter 3
- Assignment: FEDAI Chapter 2 Problem Set Due

Wednesday, January 31st

- Reading: FEDAI Chapter 3

Monday, February 5th

- Reading: FEDAI Chapter 4
- Assignment: FEDAI Chapter 3 Problem Set Due

Wednesday, Feburary 7th

- Beath et al. (2013)

Monday, February 12th

- Reading: FEDAI Chapter 5
- Assignment: FEDAI Chapter 4 Problem Set Due

Wednesday, February 14th

- Gerber and Green (2000)
- Broockman (2016)

Monday, February 19th

- Reading: FEDAI Chapter 6

- Assignment: FEDAI Chapter 5 Problem Set Due (do not do Q1b)
- Assignment: Practicum Experiment Proposal due (max 1 page)

Wednesday, February 21st

- Reading: Karpowitz et al. (N.d.)

Monday, February 26th

- Assignment: FEDAI Chapter 6 Problem Set Due
- Assignment: Practicum Experiment Preanalysis plan due

Wednesday, February 28th

- Reading: Ashraf et al. (2010)

Monday, March 5th

- Assignment: Practicum Experiment Writeup due (please refer to FEDAI Chapter 13 for a guide to writing up your experiment)
- Poster Session: ISPS Policy Lab 12:00pm - 1:00pm
- In Class Review Session

Wednesday, March 7th (Spring Recess begins Friday)

- In Class Midterm Exam

Monday, March 26th

- Reading: FEDAI Chapter 7

Wednesday, March 28th

- Reading: TBA

Monday, April 2nd

- Reading: FEDAI Chapter 8
- Assignment: FEDAI Chapter 7 Problem Set Due

Wednesday, April 4th

- Reading: TBA

Monday, April 9th

- Reading: FEDAI Chapter 9
- Assignment: FEDAI Chapter 8 Problem Set Due

Wednesday, April 11th

- Reading: Chong et al. (2015)

Monday, April 16th

- Reading: FEDAI Chapter 10
- Assignment: FEDAI Chapter 9 Problem Set Due

Wednesday, April 18th

- Reading: TBA

Monday, April 23rd

- Reading: FEDAI Chapter 11
- Assignment: FEDAI Chapter 10 Problem Set Due

Wednesday, April 24th

- Replication Proposal Due (must demonstrate that data are in hand and that you can reproduce main result)
- Reading: Green et al. (2016)

Friday, May 5th

- Replication Paper Due

## 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. 5

Beath, Andrew, Fotini Christia and Ruben Enikolopov. 2013. "Empowering Women through Development Aid: Evidence from a Field Experiment in Afghanistan." *American Political Science Review* 107(03):540–557. 4

Broockman, David E.and Kalla, Joshua. 2016. "Durably Reducing Transphobia: A Field Experiment on Door-to-door Canvassing." *Science* 352(6282):220–224. 4

Chong, Alberto, Ana de la O, Dean Karlan and Leonard Wantchekon. 2015. "Does Corruption Information Inspire the Fight or Quash the Hope? A Field Experiment in Mexico on Voter Turnout, Choice, and Party Identification." *The Journal of Politics* 77(1):55–71. 5

Gerber, Alan S. and Donald P. Green. 2000. "The Effects of Personal Canvassing, Telephone Calls, and Direct Mail on Voter Turnout: A Field Experiment." *American Political Science Review* 94. 4

Green, Donald P., Jonathan S. Krasno, Alexander Coppock, Benjamin D. Farrer, Brandon Lenoir and Joshua N. Zingher. 2016. "The Effects of Lawn Signs on Vote Outcomes: Results from Four Randomized Field Experiments." *Electoral Studies* 41:143–150. 6

Kalla, Joshua L. and David E. Broockman. 2015. "Campaign Contributions Facilitate Access to Congressional Officials: A Randomized Field Experiment." *American Journal of Political Science* 2. 4

Karpowitz, Christopher, Quin Monson and Jessica Preece. N.d. "How to Elect More Women: Gender and Candidate Success in a Field Experiment." *American Journal of Political Science*. Forthcoming. 5

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