Experimental Political Science — Trinity Term 2014

Dates: Tuesdays Weeks 1-4, 11am-1pm, MRB, Seminar Room B

Course Provider: Florian Foos (Department of Sociology & Nuffield College, florian.foos@nuffield.ox.ac.uk)

Aims of the Course:

To introduce participants to the design, conduct and analysis of randomized field and survey experiments in Political Science. To sensibilize participants to the assumptions (independence, excludability, non-interference) underlying the unbiasedness of estimators. To provide them with the practical skills to conduct their own randomized experiments, and to analyze experimental data using common software packages.

Class Structure:

Each week, we will dedicate the first hour to learning and discussing aspects of the Experimental Method, and we will spend the second hour performing random assignment (week 1), ATE (week 2) and CACE (week 3) estimation in practise. The 4th week will be dedicated to the presentation of your own class experiments. For the practical sessions, please have **Excel** , and either **R Studio** (https://www.rstudio.com/ide/download/) or **STATA** installed and readily accessible on your laptops or via remote desktop access (http://www.oucs.ox.ac.uk/network/remote/index.xml?splitLevel=-1). We won't be using the IT Lab. Data sets will be uploaded to Drop Box.

Class Experiment:

You will be encouraged to run your own, small randomized experiment during the course. The experiments will be performed on non-human subjects, and the common theme will be food tasting.

Monday of week 2: Submit Outline of Experimental Design (1-2 p).

Monday of week 3: Submit Pre-Analysis Plan (1-2 p), and Random Assignment (dataset).

By Friday of week 3: Conduct Experiment.

Tuesday of week 4: Presentation of preliminary Experimental Results.

Tuesday of week 5: Submit Write Up.

Evaluation

If you are taking this course for credit, 50% of your mark will consist of 2 short problem sets that you should submit to me by email on Monday, 6th May and Moday, May 20th, and 50% of your mark will consist of the documents associated with your class experiment (Outline of Experimental Design, Pre-Analysis Plan, Write up of Results + Data Set and R/Stata code).

Course Books:

Gerber, Alan, and Donald P. Green. 2012. Field Experiments: Design, Analysis and Interpretation. New York: W.W. Norton.

Druckman, James, N., Donald P. Green, James H. Kuklinski, and Arthur Lupia. 2011. *Cambridge Handbook of Experimental Political Science.* Cambridge: Cambridge University Press.

Morton, Rebecca B. and Kenneth C. Williams. 2010. *Experimental Political Science and the Study of Causality. From Nature to the Lab.* Cambridge: Cambridge University Press.

Mutz, Diana C. 2011. *Population-Based Survey Experiments.* Princeton: Princeton University Press.

There are 3-4 copies of each course books available from the Social Science Library.

Examples of Experimental Research:

Bechtel, Michael M., Jens Hainmueller and Yotam Margalit. 2014. Preferences for International Redistribution: The Divide over the Eurozone Bailouts. *American Journal of Political Science,* forthcoming.

Duflot, Esther, Lori Beaman, Raghabendra Chattopadhyay, Rohini Pande and Petia Topalova. Powerful Women: Does Exposure Reduce Bias?. 2009. *Quarterly Journal of Economics* 124(4): 1497-1540.

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(1): 33-48.

Gerber, Alan S., Gregory A. Huber and Ebonya Washington. 2010. Party Affiliation, Partisanship, and Political Beliefs: A Field Experiment, *American Political Science Review* 104(04): 720-744.

Groenendyk, Eric W. 2012. Justifying Party Identification: A Case of Identifying with the Lesser of Two Evils. *Political Behavior* 34(3): 453-475.

LaCour, Michael J. and Donald P. Green. 2014. Messages, Messengers, and Diffusion of Support for Gay Equality: Results from Two Longitudinal Field Experiements." Working paper.

Vicente, Pedro, and Leonard Wantchekon. Clientism and Vote Buying: Lessons from Field Experiments in West Africa.*Oxford Review of Economic Policy.* 25.2 (2009): 292-305.

For Discussion:

E. Miguel, C. Camerer, K. Casey, J. Cohen, K. M. Esterling, A. Gerber, R. Glennerster, D. P. Green, M. Humphreys, G., Imbens, D. Laitin, T. Madon, L. Nelson, B. A. Nosek, M. Petersen, R. Sedlmayr, J. P. Simmons, U. Simonsohn, and M. Van der Laan. 2014. Promoting Transparency in Social Science Research. Science. 3 January: 30-31.

Course Structure

Week 1: The Experimental Method

1. Internal vs External Validity?

   Morton and Williams: 7.1-7.4; Gerber and Green: Ch 1, p. 7-8.; Druckman et al.: Ch 3-4, 16.

2. Design vs Analysis?

   Morton and Williams: 3.4.

3. What Counts as an Experiment?

   Morton and Williams: 2.4; Gerber and Green: Ch 1, p. 2-7; Druckman et al.: Ch 1.

4. Experimental Settings

   Morton and Williams: 8.2; Gerber and Green: Ch 1, p. 13-16; Mutz: Ch 1, p. 5-13.

5. Experimental Designs

   Mutz: Ch 1, p. 5-13; Morton and Williams: 3.3.

6. Potential Outcomes

   Gerber and Green: Ch 2, p. 21-25; Morton and Williams: 3.3.

7. The Average Treatment Effect (ATE)

   Gerber and Green: Ch 2, p. 21-25; Morton and Williams: 3.5.

8. The Independence Assumption

   Gerber and Green: Ch 2, p. 30-39.

9. Random Assignment

   Gerber and Green: Ch 2, p. 30-39; Druckman et al.: Ch 2: p. 17-18.

10. Balance Tests

    Gerber and Green: Ch 2, p. 105-109; Mutz: Ch 7, 108-112.

Practical Skills:

Performing Random Assignment in Excel, Stata and R.

Problem Set 1:

Question 1:

A parody appearing in the British Medical Journal questioned whether parachutes are in fact effective in preventing death when skydivers are presented with severe "gravitational challenges". The authors point out that no randomized trials have assigned parachutes to skydivers. Why is it reasonable to believe that parachutes are effective even in the abscence of randomized experiments that establish their efficacy?

Question 2:

Many summer schools claim to prepare students for admission to University. In an effort to study the effectiveness of these summer programs, a researcher draws a random sample of students attending 6th form in the UK, and compares the admission rates of those who participated in a summer school to those who did not. Is this an experiment or an observational study? Why?

Question 3:

A UK parliamentary candidate has heard that door-hangers apparently increased electoral turnout in the 2012 US Presidential election. In an effort to convince a labour union to pay for a large-scale deployment of door hangers in the 2015 General Election, she decides to run a pilot. She proposes

to distribute door-hangers to 500 party supporters before the 2014 European Elections. After the election, the candidate proposes to consult the electoral register and to compare turnout among households that received a door hanger to turnout in households that did not receive a door hanger. Is this an experiment or an observational study? What would you advice the candidate to do? If you were the Union boss, would you pay for the door-hangers?

Question 4:

(a) What are Potential Outcomes? Explain the notations $Y_i(0)$ and $Y_i(1)$.

(b) Explain the switching equation $Y_i = d_i Y_i(1) + (1\text{-}d_i)Yi(0)$.

(c) Define the ATE.

(d) Contrast the meaning of $Y_i(0) \mid D_i = 1$ with the meaning of $Y_i(0) \mid D_i = 0$.

(e) What are Expectations? Contrast the meaning of $E[Y_i(0)]$ and $E[Y_i(1)]$ with the meaning of $Y_i(0)$ and $Y_i(1)$.

(f) Explain why the "selection bias" term $\mathrm{E}[Y_i(0) \mid D_i = 1]$ - $\mathrm{E}[Y_i(0) \mid D_i = 0]$ in the following equation $\mathrm{E}[Y_i(1) - Y_i(0) \mid D_i = 1] + \mathrm{E}[Y_i(0) \mid D_i = 1] - \mathrm{E}[Y_i(0) \mid D_i = 0]$, is zero when D_i is randomly assigned.

Question 5:

Foos and de Rooij (2013) study the effects of partisan and non-partisan telephone calls on voter turnout in a Police and Crime Commisioner Election. Using the subsample provided, randomly assign half of subjects to control, and half of subjects to one of two treatment groups. Use either Excel, Stata or R for random assignment, and submit both your data set and your code (in case you decide to use Excel, write down the steps).

Week 2: Identification and Estimation Issues

1. Identification of Average Treatment Effect (ATE)

   Gerber and Green: Ch 2 p. 30-38; Morton and Williams: 3.5.1

2. Excludability Assumption

   Gerber and Green, Ch 2 p. 39-43.

3. Non-Interference Assumption

   Gerber and Green: Ch 2 p. 43-44; Morton and Williams: 3.6.

3. ATE estimation using Regression Methods:

   Gerber and Green: Ch 3 p. 43-44.

4. ATE estimation using Randomization-based Inference

   Gerber and Green, Ch 3 p. 59-71.

5. Reducing Variability in Potential Outcomes

   a) Blocked Random Assignment

      Gerber and Green: Ch 3 p. 71-79; Mutz: Ch 6: 95-97.

   b) Covariate Adjustment

      Gerber and Green: Ch 4., Mutz: Ch 7, p. 123-126.

Practical Skills:

ATE Estimation in Stata and in R.

Week 3: Field Experiments

1. Measurement levels of dependent variable

2. Cluster Random Assignment

   Gerber and Green: Ch 3, p. 80-85

3. Non-Compliance

   Gerber and Green: Ch 5-6.

a) The Intent to Treat Effect (ITT)

Gerber and Green: Ch 5, p. 138,139.

b) The Complier Average Causal Effect (CACE)

Gerber and Green: Ch 5, p. 143, 147.

4. Missing data

Gerber and Green: Ch 7.

5. Common Practical Issues: Research Ethics, Co-operation with Outside Actors.

Practical Skills:

ITT and CACE Estimation in Stata and in R.

Problem Set 2

Question 1:

Suppose researchers seek to assess the effect of receiving a free newspaper subscription on students' interest in politics. A list of student dorms is drawn up and sorted randomly. Dorm rooms in the first half of the randomly sorted list receive a newspaper at their door each morning for two months; dorm rooms in the second half of the list do not receive a paper.

(a) University researchers are sometimes required to disclose to subjects that they are participating in an experiment. Suppose that prior to the experiment, researchers distributed a letter informing students in the treatment group that they would be receiving a newspaper as part of a study to see if newspapers make students more interested in politics. Explain (in words and using potential outcomes notation) how this disclosure may jeopardise the exludability assumption.

(b) Suppose that students in the treatment group carry their newspapers to the cafeteria where they may be read by others. Explain (in words and using potential outcomes notation) how this may jeopardize the non-intereference assumption.

Question 2:

What are Compliers, Always-Takers, Never-Takers and Defiers? Why do we need to assume

that there are no defiers in our sample if we want to identify the CACE given two-sided non-compliance?

Question 3:

Explain whether each of the following statements is true or false for the case of one-sided non-compliance, assuming that an experiment satisfies non-compliance and excludiability:

(a) If the ITT is negative, the CACE must be negative.

(b) The smaller the ITT_D, the larger the CACE.

(c) One cannot identify the CACE if no one in the experiment receives the treatment.

(d) Compliers are those subjects who follow the suggested action when treated, i.e. they recycle or vote when contacted.

Question 4:

Foos and de Rooij (2013) report the results of a randomized field experiment conducted in Birmingham during the Police and Crime Commissioner Elections. In the week preceding the election, individuals on the voter register were randomly assigned to be called by party workers or not to be contacted. Outcomes were measured by whether subjects turned out to vote or not. When implementing the intervention, the researchers encountered one-sided non-compliance. 226 of 531 Labour partisans assigned to the treatment group were succesfully contacted, none of the 1,561 Labour partisans assigned to the control group were called. The researchers found that 106 individuals in the treatment group voted, as opposed to 270 in the control group. The researchers also observed that 116 individuals who were succesfully contacted voted, as opposed to 358 of the subjects who were not contacted.

a) Explain why comparing the turnout rates of treated and untreated subjects tends to produce misleading estimates of the CACE.

b) Calculate the ITT by hand, estimate the ITT using Stata or R, and interpret the results.

c) Calculate the ITT_D by hand.

d) Using the equations in theorem 5.1(Gerber and Green 2012, pp. 144) as a guide, write down a

model of the expected turnout rate among those assigned to the treatment group. Show that under the assumption of Theorem 5.1 the CACE can be identified based on the design of the experiment. e) Calculate the CACE by hand, estimate the CACE using Stata or R and interpret the results.

Question 5:

Sometimes experimental researchers exclude subjects from their analysis because the subjects (1) appear to understand what hypothesis the experiment is testing (2) seem not to be taking the experiment seriously (3) fail to follow directions. Discuss whether each of these three practices is likely to introduce bias when the researcher compares average outcomes among non-excluded subjects.

Week 4: Survey Experiments

1. Populations and samples

   Mutz: Ch 1; Druckman et al. Ch 8.

2. Different Treatments

   a) Direct and Indirect Treatments

      Mutz: Ch 3.

   b) Vignette Designs

      Mutz: Ch 4.

3. Timing of Measurement and Persistence of Effects

   Mutz: Ch 6. p. 86-89.

4. Weighting

   Mutz: Ch 3., p. 112-123.

Practical Skills:

Presentation of Experimental Results.