PP 202: Problem Set

Due Date: 4/20/2023

- You should submit your problem set as a PDF on BruinLearn.
- You can work in small groups, but you should write every line of text or code that you submit.

1 Political games

A city council has 3 people on it. For a bill to pass, at least 2 must vote yes.

Suppose a bill comes up for a vote. All three council members would like the bill to pass. But the bill is unpopular with many voters, so they would ideally like it to pass without having to personally vote yes.

In particular, each council member's ranking of outcomes is this:

- Best outcome (i.e., highest payoff): Vote no but have the bill pass.
- 2nd best outcome: Vote yes and have the bill pass.
- 3rd best outcome: Vote no and have the bill fail.
- Worst outcome (i.e., lowest payoff): Vote yes and have the bill fail.

Abstentions are not allowed, each council member must either vote yes or no. Voting occurs simultaneously.

1. How many voting outcomes (i.e., strategy profiles) are there in this scenario?
2. Suppose Member 1 thinks both other members will vote Yes. What is Member 1's best response?
3. Suppose Member 1 thinks one other council member will vote Yes and one will vote No. What is Member 1's best response?

4. Is it a Nash Equilibrium for Members 1 and 2 to vote Yes and Member 3 to vote No?
5. Is it a Nash Equilibrium for Member 1 to vote No and Members 2 and 3 to vote Yes?
6. Is it a Nash Equilibrium for all three council members to vote Yes?
7. Is it a Nash Equilibrium for all three council members to vote No?
8. Imagine you are advising Member 1. What would you advise Member 1 to do in the run up to the vote? (Write a *short* paragraph.)

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2 Election post-mortem

The Republican National Committee (RNC) has hired three consultants and asked them to determine *the* cause of their loss in the 2020 presidential election.

- Consultant 1: "Republicans did not do enough TV advertising."
- Consultant 2: "Republicans should not have criticized mail-in voting, which depressed turnout."
- Consultant 3: "President Trump should have done a better job containing COVID-19."

The RNC is confused by these conflicting claims about the cause of their 2020 loss. They hire you to adjudicate between these three possibilities and tell them which is the true cause. *What would you tell them? How would you suggest they proceed?*

Your answer should be 1-2 paragraphs (max: 400 words).

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3 Selection bias in the wild

Find an example of a journalist or policymaker who you believe has wrongly interpreted a correlation as evidence of a causal relationship. First, describe the comparison that the journalist or policymaker relies on and, second, explain why you think this correlation is not persuasive evidence of a causal relationship. If you think the relationship is confounded, be specific about potential sources of confounding. If you think reverse causality may be at play, explain how that would work.

Your answer should be 1-2 short paragraphs (max: 400 words). Include a link to the source you are critiquing.

4 Analyzing experimental data

For this problem, we'll use data from 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. Read through the abstract to familiarize yourself with the treatments and the thinking behind each of the messages sent to households.

I recommend you work with a smaller sample of their data: sample.

But you can download the full data here if you're so inclined: full dataset.

1. Calculate the proportion of individuals who turnout (variable: `voted_ind`) for control and each of the treatment groups (variable: `treatment`).
2. Assess whether the following variables are balanced (i.e., have similar means) between control and the treatment groups: (1) sex (`sex`), (2) year of birth (`yob`), and (3) whether the individual voted in August 2004 (`p2004`). (*Hint*: look at the values these variables can take. You may have to convert them before you can start taking averages.)
3. Use a regression to estimate the average treatment effects on voter turnout. (Optional: try clustering your standard errors at the household-level, which is the level at which treatment was assigned.)
4. Present your regression using a table or figure.
5. Test the null hypothesis that the average treatment effect in the "Civic Duty" group is the same as the average treatment effect in the "Neighbors" group.
6. The authors chose to randomize treatment across households, not across individuals. How might that choice help to limit bias due to interference or spillovers?