CIV 337 Homework 3

due: **9/18/24**

Instructions: Please submit solutions on canvas. Only a knitted pdf of an `Rmarkdown` file will be accepted.

Problem 1: QSS exercise 2.8.2. In this exercise, we analyze the data from two experiments in which households were canvassed for support on gay marriage.[1] Note that the original study was later retracted due to allegations of fabricated data. In this exercise, however, we analyze the original data while ignoring the allegations.

Canvassers were given a script leading to conversations that averaged about twenty minutes. A distinctive feature of this study is that gay and straight canvassers were randomly assigned to households and canvassers revealed whether they were straight or gay in the course of the conversation. The experiment aims to test the 'contact hypothesis,' which contends that out-group hostility (towards gays in this case) diminishes when people from different groups interact with one another.

The data file is `gay.csv`. The names and descriptions of variables are:

Variable	Description
`study`	Study (1 or 2)
`treatment`	Treatment assignment (5 possible options): `No contact, Same-Sex Marriage Script by Gay Canvasser, Same-Sex Marriage Script by Straight Canvasser, Recycling Script by Gay Canvasser, and Recycling Script by Straight Canvasser`
`wave`	Survey wave (1-7). Note that Study 2 lacks wave 5 and 6.
`ssm`	Support for gay marriage (1 to 5). Higher scores indicate more support.

Each observation of this data set is a respondent giving a response to a five-point survey item on same-sex marriage. There are two different studies in this data set, involving interviews during 7 different time periods (i.e. 7 waves). In both studies, the first wave consists of the interview before the canvassing treatment occurs.

a. Using the baseline interview wave before the treatment is administered, examine whether randomization was properly conducted. Base your analysis on the three groups of Study 1: `Same-Sex Marriage Script by Gay Canvasser, Same-Sex Marriage Script by Straight Canvasser` and `No Contact.` Briefly comment on the results.

b. The second wave of survey was implemented two months after the canvassing. Using Study 1, estimate the average treatment effects of gay and straight canvassers on support for same-sex marriage, separately. Give a brief interpretation of the results.

c. The study contained another treatment that involves contact, but does not involve using the gay marriage script. Specifically, the authors used a script to encourage people to recycle. What is the purpose of this treatment? Using Study 1 and wave 2, compare outcomes from the treatment `Same-Sex Marriage Script by Gay Canvasser` to `Recycling Script by Gay Canvasser.` Repeat the same for straight canvassers, comparing the treatment `Same-Sex Marriage Script by Straight Canvasser` to `Recycling Script by Straight Canvasser.` What do these comparisons reveal? Give a substantive interpretation of the results.

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[1]This exercise is based on: LaCour, M. J., and D. P. Green. 2014. When Contact Changes Minds: An Experiment on Transmission of Support for Gay Equality. *Science* 346(6215): 1366-69.

d. In Study 1, the authors reinterviewed the respondents 6 different times (in waves 2 to 7) after treatment, at two month intervals. The last interview in wave 7 occurs one year after treatment. Do the effects of canvassing last? If so, under what conditions? Answer these questions by separately computing the average effects of straight and gay canvassers with the same-sex marriage script for each of the subsequent waves (relative to the control condition).

e. The researchers conducted a second study to replicate the core results of the first study. In this study, same-sex marriage scripts are only given by gay canvassers. For Study 2, use the treatments `Same-Sex Marriage Script by Gay Canvasser` and `No Contact` to examine whether randomization was appropriately conducted. Use the baseline support from wave 1 for this analysis.

f. For Study 2, estimate the treatment effects of gay canvassing using data from wave 2. Are the results consistent with those of Study 1?

g. Using Study 2, estimate the average effect of gay canvassing at each subsequent wave and observe how it changes over time. Note that Study 2 did not have 5th or 6th wave, but the 7th wave occurred one year after treatment as in Study 1. Draw an overall conclusion from both Study 1 and Study 2.

Problem 2: QSS exercise 2.8.3. One longstanding debate in the study of international relations concerns the question of whether individual political leaders can make a difference. Some emphasize that leaders with different ideologies and personalities can significantly affect the course of a nation. Others argue that political leaders are severely constrained by historical and institutional forces. Did individuals like Hitler, Mao, Roosevelt, and Churchill make a big difference? The difficulty of empirically testing these arguments stems from the fact that the change of leadership is not random and there are many confounding factors to be adjusted for.

In this exercise, we consider a *natural experiment* in which the success or failure of assassination attempts is assumed to be essentially random.[2]

Each observation of the data set `leaders.csv` contains information about an assassination attempt. The variables are:

Variable	Description
country	The name of the country
year	Year of assassination
leadername	Name of leader who was targeted
age	Age of the targeted leader
politybefore	Average polity score during the 3 year period prior to the attempt
polityafter	Average polity score during the 3 year period after the attempt
civilwarbefore	1 if country is in civil war during the 3 year period prior to the attempt, or 0
civilwarafter	1 if country is in civil war during the 3 year period after the attempt, or 0
interwarbefore	1 if country is in international war during the 3 year period prior to the attempt, or 0
interwarafter	1 if country is in international war during the 3 year period after the attempt, or 0
result	Result of the assassination attempt, one of 10 categories described below

[2]This exercise is based on: Jones, Benjamin F, and Benjamin A Olken. 2009. Hit or Miss? The Effect of Assassinations on Institutions and War. *American Economic Journal: Macroeconomics* 1(2): 55-87.

The `polity` variable represents the so-called *polity score* from the Polity Project. The Polity Project systematically documents and quantifies the regime types of all countries in the world from 1800. The polity score is a 21-point scale ranging from -10 (hereditary monarchy) to 10 (consolidated democracy). The `result` variable is a 10 category factor variable describing the result of each assassination attempt.

a. How many assassination attempts are recorded in the data? How many countries experience at least one leader assassination attempt? (The `unique` function, which returns a set of unique values from the input vector, may be useful here). What is the average number of such attempts (per year) among these countries?

b. Create a new binary variable named `success` that is equal to 1 if a leader dies from the attack and to 0 if the leader survives. Store this new variable as part of the original data frame. What is the overall success rate of leader assassination? Does the result speak to the validity of the assumption that the success of assassination attempts is randomly determined?

c. Investigate whether the average polity score over 3 years prior to an assassination attempt differs on average between successful and failed attempts. Also, examine whether there is any difference in the age of targeted leaders between successful and failed attempts. Briefly interpret the results in light of the validity of the aforementioned assumption.

d. Repeat the same analysis as in the previous question, but this time using the country's experience of civil and international war. Create a new binary variable in the data frame called `warbefore`. Code the variable such that it is equal to 1 if a country is in either civil or international war during the 3 years prior to an assassination attempt. Provide a brief interpretation of the result.

e. Does successful leader assassination cause democratization? Does successful leader assassination lead countries to war? Answer these questions by analyzing the data. Be sure to state your assumptions and provide a brief interpretation of the results.