Political Science 202
Introduction to Political Analysis
Fall 2023: Problem Set #9

Due on Blackboard on Friday, December 8 at 6:00 PM. 3 points in total. Late submissions are penalized with 1 point per 24 hours.

MAKE SURE THAT YOU RECEIVE AN UPLOAD CONFIRMATION and SAVE THE CONFIRMATION (submission date and confirmation number). If you have trouble uploading to Blackboard, email as an attachment to your TA before the deadline. If you don't get a reply confirming that you handed it in, send it again.

You can discuss the problem set with others, but you need to submit your own answers. If you discussed the problem set with others, note their names on your submission.

1. There are two types of electoral systems: Proportional representation (PR), where the share of seats of each party in the legislature is proportional to its vote share; and majoritarian systems, where the country is divided into electoral districts and the candidates who receive the most votes in their district are elected. Prof. Katharine hypothesizes that electoral systems affect turnout: In a comparison of countries, countries with PR systems will have higher turnouts than will countries with majoritarian systems. Level of economic development is an important control variable, because development, measured as gross domestic product (GDP) per capita, is known to be an alternative cause of voter participation. Therefore, she evaluates the electoral system–turnout relationship, controlling for per capita GDP.

   Among countries with low per capita GDP, the mean levels of turnout are as follows: majoritarian countries, 56.1 percent; PR countries, 69.8 percent. Among countries with high GDP per capita: majoritarian countries, 66.0 percent; PR countries, 68.5 percent.

   a) Construct a mean comparison control table from the information provided.
   b) Decide which pattern—spuriousness, additive, or interaction—best describes the set of relationships. Write a complete sentence explaining your answer.

2. We use the following regression equation to estimate the effect of two factors on the thermometer score of a politician:

   $$\text{Thermometer score} = a + b1 \cdot \text{Age} + b2 \cdot \text{Female}$$

   The variables are measured as follows:
   - Thermometer score: Score from 0 (don't like at all) to 100 (like very much)
   - Age: Respondent's age in years
   - Female: coded 1 if respondent is female, 0 if not

The table of regression coefficients is as follows:

Variable	**Coefficient**	**Standard Error**
Age	-0.25	0.1
Female	8	1.5
Intercept	62	3

a) Interpret the substantive meaning of the coefficient of Age. Can we reject the null hypothesis?
b) Interpret the substantive meaning of the coefficient of Female. Can we reject the null hypothesis?
c) What is the predicted thermometer score of someone who is female and 25 years old? How about someone who is male and 45 years old?