PSC 103B

Homework 3

Winter 2025

**Instructions**

Please use R/RStudio to complete the following questions. You will submit your filled-out version of this document **as a PDF** on Canvas. Make sure your PDF looks as expected before submitting. Unless otherwise specified, please **always** **include the code you used to generate your answer for each question, or the steps you used to calculate the answer (when relevant), as well as the final answer and/or relevant output** (output is what comes out in the console when you run an R command, e.g., the results of the model when you run summary(fit1)).It’s a good idea to organize your R code in the R script and save it, so if you need to modify or recalculate one of the questions, that’s easy to do (see the R scripts provided in previous weeks for tips on how to organize your code). If you copy and paste code or output into this document (screenshots are also acceptable), **please format the code and output using a fixed-width font** (e.g., Courier) so it’s easier to read.

You may consult with your classmates while working on the assignment, but **you must do all the work yourself – everything you turn in must be your own code and words**. Academic dishonesty will not be tolerated.

Please submit **a pdf version of this document** with your answers on Canvas by **4:00pm on Thursday, February 6.**

We will be using the same npas.csv dataset (available on the Lab page of Canvas) to answer the following questions. Here are the variables you’ll be working with:

* nerdy\_scale: Participant’s average “nerdiness” score from the NPAS (measured on a 1-5 scale)
* TIPI1: How extraverted or enthuasiastic the paritcipant rates themselves (measured on a 1-7 scale)
* TIPI5: How open to new experiences or complex the participant rates themselves (measured on a 1-7 scale)

# Question 1

Fit a multiple regression model in R, with nerdy\_scale as the outcome variable and TIPI1 and TIPI5 as the predictors. Show your code, and include the model summary (paste or screenshot the output). (1 point)

# Question 2

Write out the regression model, using the intercept and slope values you estimated above. (1 point)

**Question 3**

Interpret each of the intercept and slope values in terms what they mean for the relation between nerdiness, extraversion, and openness to new experiences (3 points).

# Question 4

Report the appropriate value from the model output (1 point). Interpret this value (1 point).

# Question 5

Mean-center the predictors and re-run the model of Question 1, but now with the new centered predictors. What values have changed from the output of Question 1 (1 point)? How has the interpretation of the intercept and slope values changed? Show your code and output (3 points).

# Question 6

Run a model with an interaction between the centered TIPI1 predictor and centered TIPI5 predictor. Is this interaction significant (1 point)? Explain (in general terms, no need to visualize this interaction) what this interaction means about the effect of openness to new experiences on nerdiness (1 point). Show your code and model output.