

Lab 10 Homework: ANOVA and 2-Sample T-test

The Data: Emory Students

For this lab practice, you will be using the QTM 100 class survey data from Spring 2013 to explore variables associated with GPA. The dataset `SurveySP13.csv` contains the following variables, among others:

- GPA: Student's Grade Point Average
- `hrs_facebook`: Number of hours spent on Facebook in a typical day
- `gender`: male/female
- Other variables (refer to dataset documentation)

Practice

1. We will look at `hrs_facebook`, to see if social media habits impact GPA.

- (a) Inspect `hrs_facebook` using a frequency table or histogram. What is the distribution like? Is Facebook eating their GPAs alive?
- (b) Recode `hrs_facebook` so that it is a factor variable with three categories:
 - 0-1 hours
 - 2-3 hours
 - 4 or more hours
- (c) Look at the relationship between `hrs_facebook` and GPA. Describe the differences in means. Do students who live on Facebook have lower GPAs?

- (d) Examine the distribution of GPA for each category of your new Facebook variable. Are the distributions reasonably normal? Or does the data cry out for help?

2. Estimate an ANOVA for your new Facebook variable and GPA.

- (a) Based on your analysis in Question 1, is an ANOVA appropriate? What assumptions must hold? Is Facebook use the hill GPA dies on?
- (b) Based on your findings, what is your statistical decision? Is there a relationship between Facebook usage and GPA, or are we blaming Zuckerberg for nothing?

3. Now, do a pairwise comparison on Facebook use and GPA.

- (a) What was the measured difference in GPA between those who use Facebook for 0-1 hours and those who use it for 4 or more?
- (b) What was the p-value associated with this difference?
- (c) Was any pairwise comparison significant? Did anyone escape the clutches of the algorithm?
- (d) Should we have done the Tukey test, or was that a waste of precious time we could have spent scrolling?

4. Perform a hypothesis test (following the 7 steps of Hypothesis Testing mentioned in lecture) to determine if the average GPA differs between female and male students.

What's your conclusion? Is gender a stronger predictor of GPA than digital addiction?