

Lecture 7: Confidence Intervals

Practice Problems

STAT 310, Spring 2021

**Exercise 1.** We are interested in estimating the proportion of graduates at a mid-sized college who found a job within one year of completing their undergraduate degree. Suppose we conduct a survey and find that 348 of the 400 randomly sampled graduates found jobs.

- (a) Calculate a 95% confidence interval for the proportion of graduates who found jobs within one year of completing their undergraduate degree at this university. Interpret the interval in the context of the data.

- (b) Check if the conditions for constructing a confidence interval based on this data are met.

- (c) If using the same data, would a 99% confidence interval be wider or narrower than a 95% confidence interval?

**Exercise 2.** The General Social Survey asked a random sample of 1,390 Americans the following question: “On the whole, do you think it should or should not be the government’s responsibility to promote equality between men and women?” 82% of the respondents said it “should be”. At a 95% confidence level, this sample has 2% margin of error. Based on this information, determine if the following statements are true or false.

- (a) We are 95% confident that between 80% and 84% of Americans in this sample think it’s the government’s responsibility to promote equality between men and women.
- (b) We are 95% confident that between 80% and 84% of all Americans think it’s the government’s responsibility to promote equality between men and women.
- (c) If we considered many random samples of 1,390 Americans, and we calculated 95% confidence intervals for each, about 95% of these intervals would include the true population proportion of Americans who think it’s the government’s responsibility to promote equality between men and women.
- (d) Based on this confidence interval, there is sufficient evidence to conclude that a majority of Americans think it’s the government’s responsibility to promote equality between men and women.