

Your Name: _____

Names of people you worked with: _____

Instructions: Work on this problem in class with your group. Do your best. This piece of paper will be collected during class.

Task: Consider the situation where many hundreds of researchers are asking the exact same question with the same sample size from the same population (but they each take a different sample). With their sample of data, they estimate the shape of the sampling distribution and use it to find a 95% confidence interval – i.e., they use the middle 95% of the bootstrapped proportions as the most plausible range of values for p .

1. Will every researcher's interval captures p ? Why or why not?
2. If a particular researcher didn't capture the true value of p is that evidence that their data (or data collection method) was wrong? Explain.

Solution:

1. No, some researchers will create intervals that will not capture p . That's because the original dataset is farther from p than given by the shape of the sampling distribution.
2. No, a single researcher failing to capture p is not an indication of an error in the data. In fact, we expect 5% of good samples to fail to capture p in 95% confidence intervals.

If the researcher happened to get a sample with an extremely high proportion of successes, or an extremely low proportion of successes, the statistic (sample proportion on the observed data) will be far from the parameter (true population proportion). How far? Farther than we measure when approximating the shape of the sampling distribution.