Political Science 202
Introduction to Political Analysis
Fall 2021: Problem Set #4

Due in Turnitin (Blackboard) on Friday, October 15 at 10am. 5 points in total. Late submissions are penalized with 1 point per 24 hours. MAKE SURE THAT YOU RECEIVED THE TURNITIN UPLOAD CONFIRMATION and SAVE THE CONFIRMATION. If you have trouble uploading to Turnitin or don't receive a confirmation, 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.

1. The mayor of Syracuse receives a large number of complaints about excessive speeding on a segment of Highway 81 where the speed limit is 45mph. He decides to undertake a vigorous advertisement campaign that promotes driving within the speed limit. After the campaign has concluded, the city randomly selects a random sample of 50 cars and measures their speed. The mean of the sample is 51mph, with a standard deviation of 25.

   a) What is the standard error of the mean?
   b) What is the 95% confidence interval of the sample mean? Interpret what it tells us.

   An aide suggests that a sample of 50 cars is too small, and instead suggests collecting data from 5000 cars. She argues that this will decrease the standard error (and thus the confidence intervals), which will allow the city to be more certain about the effects of the advertising campaign. The mayor is concerned about the cost of collecting 100 times more data, but eventually agrees. The sample of 5000 cars again has a mean of 51mph and a standard deviation of 25.

   c) Compute the standard error of the mean and the 95% confidence interval. Interpret what the interval tells us.
   d) Compare the standard error you computed in a) and the one you computed in c). How much smaller is it in the latter case, where the sample was 100 times larger? What does this tell you about the relation between sample size and standard error?