

Assignment 3

1. Suppose that a poll of 1,200 American adults is conducted and it is found that 46% of respondents support the Democratic stimulus package.
 - (i) What is the margin of error for this poll?
 - (ii) What is the 95% confidence interval?
 - (iii) What is the 99% confidence interval?
 - (iv) What does this margin of error mean?
 - (v) What does the 95% confidence interval mean?
 - (vi) How large would the sample size have to be to guarantee a margin of error no larger than 2%?
 - (vii) Do you agree with the following statement? “Being 99% certain is always better than being 95% certain, so I always prefer a 99% confidence interval to a 95% confidence interval”? Why or why not?

2. In a survey of 10,000 American adults, it is found that the average respondent has owned 3.4 cars in his lifetime (with a standard deviation of 2.1).
 - (i) Does it make sense to talk about the margin of error of the average number of cars owned? What or why not?
 - (ii) Interpret the 90% confidence interval?

3. Suppose that two public opinion polls are conducted, each with a sample size of 1,000. In the first poll, conducted last week, it is found that 64% of respondents approve of president Obama. In the second poll, conducted this week, it is found that 62% of respondents approve of President Obama. Did the population proportion of American adults who approve of President Obama decrease? Justify your result.

4. Suppose that the population average SAT scores of Stony Brook students is 1220. Suppose that there are 6 students registered for PSC 351, and these students have a sample mean SAT score of 1250 with a standard deviation of 90. Test the null hypothesis that the average PSC 351 student has an SAT score of 1220 against the alternative that the average is different from 1220, using the $\alpha = 0.05$ significance level. What does this result mean? Would your answer change if you used a 10% significance level?

5. Consider the 2001 Israeli Election Study data set. Were Israeli Arabs less likely to vote for Benjamin Netanyahu in the 1999 Election? Consider the variables B20 and JEWARAB in your analysis (use the 5% significance level).

6. Consider the 2004 American National Election Study data file available on the course webpage. The variable "Id" has voters place themselves on a 1-7 ideology scale.

- (i) According to this scale, are males in the population more conservative than females in the population? Justify your answer with an appropriate hypothesis test (using the 5% significance level).

- (ii) According to this scale, are non-Blacks in the population more conservative than Blacks in the population? Justify your answer with an appropriate hypothesis test (use the 1% significance level).