

# PSYC 2317: Statistical Methods for Psychology

Tarleton State University

Week 11 Homework

Fall 2019

1. A random sample of  $N = 25$  individuals is selected from a population, and a treatment is administered to each individual in the sample. After treatment, the sample mean is found to be  $\bar{X} = 35.2$  with  $SS = 412$ . Construct a 95% confidence interval for  $\mu$ , the population mean for the treatment group.
2. To evaluate the effect of a treatment, a sample is obtained and a treatment is administered to the individuals in the sample. After treatment, the sample mean is found to be  $\bar{X} = 14.8$  with a standard deviation of  $\hat{\sigma} = 4.1$ . Construct a 95% confidence interval for  $\mu$ , the population mean for the treatment group, assuming the sample contains:
  - (a)  $N = 15$  individuals.
  - (b)  $N = 30$  individuals.
  - (c) Comparing your answers for parts (a) and (b), how does the size of the sample influence the precision of your interval estimate for  $\mu$ ?
3. The following data are from a repeated measures study examining the effect of a treatment by measuring a group of  $N = 6$  participants before and after they receive the treatment.

Before	7	2	4	5	5	3
After	8	9	6	7	6	8

Construct a 95% confidence interval for  $\mu_D$ , the population mean of the difference between treatments.

4. A researcher surveys a group of college students to determine the negative life events that they experienced in the past 5 years and their current feeling of well-being. For  $N = 18$  participants with 2 or fewer negative experiences, the average well-being score was  $\bar{X} = 42$  with  $SS = 398$ . For the  $N = 16$  participants with 5 to 10 negative experiences the average score is  $\bar{X} = 48.6$  with  $SS = 370$ . Construct a 95% confidence interval for the difference between the population means for the two groups.
5. In 1974, Loftus and Palmer conducted a classic study demonstrating how the language used to ask a question can influence eyewitness memory. In the study, college students watched a film of an automobile accident and then they were asked questions about what they saw. One group was asked "About how fast were the cars going when they smashed into each other?" Another group was asked the same question except the verb was changed to "hit" instead of "smashed into". The "smashed into" group reported significantly higher estimates of speed than the "hit" group. Suppose a researcher repeats the study with a sample of today's college students and obtains the following results:

Smashed into	Hit
$n = 15$	$n = 15$
$M = 40.8$	$M = 34.0$
$SS = 510$	$SS = 414$

Construct a 95% confidence interval for the difference between the population means for the two groups.