

PSYCH 240: Statistics in Psychology
ASSIGNMENT 4: ONE SAMPLE STATISTICS

Purpose: The most common statistical problem involves making a decision about statistical significance for one sample (or two paired samples). This assignment is designed to give you practice in thinking about and determining the statistical significance of the outcome of a study.

Short Essay Question (4 pts.): Please provide a typewritten answer to the following essay question.

1. How are significance tests, confidence intervals, and effect sizes different from each other? In making the comparisons, explain the purpose and interpretation of each in your own words.

Problem-Based Questions (4 pts. each): Please show all work and clearly identify the final answer for each of the following questions.

Study: A researcher was interested in comparing the amount of statistics anxiety for college students at two time points during a semester. A random sample of 7 students rated their own levels of statistics anxiety on a 9-Point Scale (1 = not anxious, 9 = very anxious). The results are as follows:

Time 1 (First Week): 6, 7, 9, 3, 5, 6, 2

Time 2 (Final Week): 3, 4, 9, 1, 5, 6, 3

2. Use SPSS or calculate by hand whether the students during the first week differ from the average level of reported statistics anxiety in the general population ($\mu = 7.0$) using $\alpha = .05$.
 - a. On your output, calculate "by hand" the standardized effect size, and the confidence intervals for the difference using the descriptive statistic information given to you. Use appropriate marks (e.g., arrows, circles, etc.) to show that your calculations match the statistics provided by SPSS.
 - b. Describe your findings in an appropriate APA-style Results section.
3. The average GPA of students at UMass is found to be 2.75. At a faculty meeting regarding the admissions requirements for Psychology majors, they are interested in whether students in their department are significantly different from the UMass population as a whole. They decide to randomly sample undergraduates within their department and find that the mean GPA of 900 Psychology students is 2.79 with a $SD = 0.55$.
 - a. Decide whether this group of students is different from the population
 - b. Calculate the standardized effect size (Cohen's d) and determine whether this is a meaningful difference. In other words, regardless if the difference is significant, should we care?