

Chapter 17 Homework

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1. Given the following information, compute the estimated pooled variance and the estimated standard error of the mean difference between independent groups for $n_1 = 10$, $n_2 = 13$, $\hat{s}_1^2 = 5.575$, $\hat{s}_2^2 = 4.235$

2. Consider the following information for two samples randomly selected from their respective populations:

2a. Compute the estimated population variance from sample A.

Sample A	Sample B
$n_A = 49$	$n_B = 49$
$\bar{X}_A = 12.00$	$\bar{X}_B = 16.75$
$\hat{s}_A = 2.510$	$\hat{s}_B = 1.985$

2b. Compute the estimated population variance from sample B.

2c. Compute the estimated standard error of the differences between two independent means.

2d. Using the information from problem #2c, calculate the obtained t-Value.

2e. Assume $\alpha = .001$ (two-tails); what is the critical t-Value? Is the obtained t-Value from significant?

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A professor teaches two sections of the same lab course each semester and wants to know whether posting audio recordings of his lab discussions on his class website has any effect on students' grades. For one class he posts the audio recordings on his web page (condition A) and for the other class he posts a written summary of his lab discussion (condition B). To assess the effect of this manipulation on student performance the professor examines lab report grades for each of the lab sections.

1. In this scenario, is the professor testing a *directional* or *non-directional* hypothesis? How do you know?
2. Expressed in terms of μ , what are the *null* and *alternate* hypotheses for this example?

H_0 :

H_A :

Below are the relevant data for both conditions; use it to answer the questions below.

Condition A (Audio Recordings)	Sample B (No Audio Recordings)
$n_A = 10$	$n_B = 10$
$\bar{X}_A = 8.000$	$\bar{X}_B = 7.000$
$SS_A = 30$	$SS_B = 60$

3. How many degrees of freedom are there? What is the critical t-Value (t_α) for rejecting H_0 with $\alpha = .05$?
4. What is the estimated population variance based off of each sample?
5. What is the estimated pooled variance and estimated standard error of the difference between independent groups?
6. What is the obtained t-Value for the difference between the two sample means?
7. Calculate the 95% confidence interval around the mean difference.

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8. Calculate the effect size eta-squared (η^2) using the computational method. What does this value reflect?

10. Calculate the estimated pooled standard deviation and calculate Cohen's d. What does the value of Cohen's d reflect?