

Chapter 10: Comparing Two Populations or Groups

Key Vocabulary:

- difference between two proportions
- two sample z interval for proportions
- two sample z test for difference between two proportions
- two sample z statistic
- two sample t statistic
- pooled combined sample proportion
- standard error
- randomization distribution
- paired t-test
- two sample t test for means
- two sample t interval for means
- difference between two means
- pooled two sample t statistic



10.1 Comparing Two Proportions (pp. 604-618)

1. Summarize the three properties of a sampling distribution of a sample proportion:
 - Shape
 - Center
 - Spread
2. What are the shape, center, and spread of the sampling distribution of $\hat{p}_1 - \hat{p}_2$? Provide the formulas for the mean and standard deviation.
 - Shape
 - Center
 - Spread
3. What conditions need to be met for the sampling distribution of $\hat{p}_1 - \hat{p}_2$?
4. Give the formula for the *standard error* when calculating a confidence interval for $\hat{p}_1 - \hat{p}_2$, and define each variable in the equation.

10.2 Comparing Two Means (pp.627-648)

1. Summarize the three properties of a sampling distribution of a *sample mean*:
 - Shape
 - Center
 - Spread
2. What are the shape, center, and spread of the sampling distribution of $\bar{x}_1 - \bar{x}_2$? Give the formula for the mean and standard deviation.
 - Shape
 - Center
 - Spread
3. What are the conditions for the sampling distribution of $\bar{x}_1 - \bar{x}_2$?
4. Give the formula for the *two-sample t-statistic*, and define each variable in the equation.
5. Is this on the formula sheet? What does it measure?
6. What is the standard error of $\bar{x}_1 - \bar{x}_2$? Is this on the formula sheet?
7. What distribution does the two-sample *t* statistic have?

8. Why do we use a t statistic rather than a z statistic?
9. Without using technology, how do you estimate the degrees of freedom when using two-sample t -procedures?
10. How do you calculate the confidence interval for $\mu_1 - \mu_2$?
11. In a *two-sample t interval* problem, what conditions must be met for comparing two means?
12. What are the conditions for conducting a two-sample t test for $\mu_1 - \mu_2$?
13. Draw a sketch of the three possible scenarios for the alternative hypothesis.
14. Describe the *Normal Condition* when using the two sample t procedures.

15. What calculator commands are used for a two-sample t test and interval for $\mu_1 - \mu_2$?
16. How do you proceed when using two-sample t procedures to check the Normal Condition in the following cases:
- Sample size less than 15
 - Sample size at least 15
 - Large samples
17. In a two-sample problem, must/should the two sample sizes be equal?
18. When doing two-sample t procedures, should we pool the data to estimate a common standard deviation? Is there any benefit? Are there any risks?