8.3 Inferences About Two Means: Independent Samples

Quiz: Friday (8.2 and 8.3)

Last week

(8.2)

2propztest
2propZint

today

(8.3)

2samplettest
2samplet int

Two samples are **independent** if the sample values in one population are not related to (or somehow paired) with the sample values of the other population.

Two samples are <u>dependent</u> if there is some relationship so that each value in one sample is paired with a corresponding value in the other set. Dependent samples are called "matched pairs" or "paired samples".

Ex.

Independent Samples: One group of students is given a study guide for a test and a separate group of students is told to reread the chapter to prepare for the test

Dependent Samples: A group of students is given a pretest and a post-test on chapter 6. Each score on a pretest is related to a score on the post-test b/c they are from the same student.

THIS SECTION WILL ONLY CONSIDER INDEPENDENT SAMPLES....

Assumptions:

1) The two samples are independent.

2) Both samples are simple random samples.

3) Either or both conditions are satisfied: The two sample sizes are bigger than 30 or both come from populations having normal distributions.

Use a 0.05 significance level to test the claim that the scores of a science test are different. Use the traditional method.

Broward   Monroe

n = 40   n = 35 ← ─────────── df = n − 1
                                                    ↑
x-bar = 1100   x-bar = 1060   lower sample size

s = 10.6   s = 30.3

1) State H_o, H_a, and write a sentence for the claim.	2) Find the critical value. State when to reject H_o.
$H_o : \mu_1 = \mu_2$ $H_a : \mu_1 \neq \mu_2$ claim: test scores are different for Broward and Monroe.	$t_{cv} = \pm 2.032$ −2.032 2.032 $invt(.05/2, 34)$ reject H_o if t is in the critical region
3) Find the test statistic and determine whether to reject the null. Explain. $t = 7.423$ reject; t is in the critical region	4) Conclusion The test scores between Broward and Monroe are different.

Use a 95% confidence interval for the difference between the two populations means.

What does the interval suggest about the equality of the populations?

	Broward	Monroe
n	40	35
$\bar{x}$	1100	1060
s	10.6	30.3

1) Write the confidence interval.	2) Is there a difference between the populations? Explain.
$(29.119, 50.881)$	Yes there is a difference, zero is not in the interval.