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(15) Test: 2 sample t-test for means

a) Parameters: μ_S = mean angular velocity of the knee for skilled rowers

μ_N = mean angular velocity of the knee for novice rowers

$\mu_S - \mu_N$ = difference in mean angular velocity of the knee for skilled and novice rowers

Condition	Skilled	Novice
SRS	no reason to assume otherwise	no reason to assume otherwise
Independence	all skilled rowers $\geq 10(10)$	all novice rowers $\geq 10(8)$
	Condition met for both	
Normal	small sample sizes but told data showed no outliers or strong skewness	

Hypothesis: H_0: there is no difference in the mean angular velocity of the knee for skilled and novice rowers

H_a: the mean angular velocity of the knee of skilled rowers is greater than the mean angular velocity of the knee of novice rowers

$H_0: \mu_S - \mu_N = 0$

$H_a: \mu_S - \mu_N > 0$

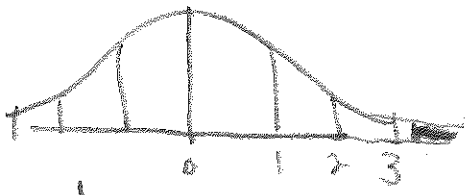
(15) cont'd

Calculation: $\bar{x}_S = 4.16283$ $\bar{x}_N = 3.01$ $n = 10$

$s_S = 0.15149$ $s_N = 0.33904$ $n = 8$ $\alpha = .01$

$df = 9.8$

$P(t > 3.1583) = .0104/2 = .0052$



must divide 2-tailed p-value to get upper tail only!

Since our p-value of .0052 is smaller than the significance level $\alpha = .01$, we have evidence to reject the null. We can conclude the mean angular velocity for the knee of skilled rowers is greater than the mean angular velocity for the knee of novice rowers.

(16) a) $t = \dfrac{70.30 - 68.45}{\sqrt{\frac{6.1003^2}{10} + \frac{9.0399^2}{8}}} = 0.5143$

* Just Run a 2 sample t-test for means & the calculator will give it to you!!

b) $2P(t > 0.5143) = 0.6165$

* We are testing the claim "different".

So the 2-tailed p-value is appropriate

$H_0: \mu_S - \mu_N = 0$

$H_a: \mu_S - \mu_N \neq 0$

(23) We are testing the claim H_0: there is no difference in mean self concept scores between male and female students

H_a: there is a difference in mean self concept scores between male and female students

A p-value of 0.411 is statistically significant at any level ($\alpha = .01$, $\alpha = .05$, $\alpha = .10$), so we have evidence to fail to reject the null. We have no evidence to conclude that mean scores differ by gender.