

Section 8.5

Comparing means using
 ~ at and pair samples
 ~ Before / After Test

Stress Levels						
$x = \text{Before Counseling}$	66	71	80	78	85	90
$y = \text{After Counseling}$	64	65	79	81	81	91
$d = x - y$	2	6	1	-3	4	-1

Notation : $\mu_1 = \text{before mean}$, $\mu_2 = \text{after mean}$
 $\mu_d = \text{mean difference} = \mu_1 - \mu_2$

Parameter : $\mu_d = \mu_1 - \mu_2$

Hypotheses : $H_0 : \mu_1 = \mu_2$
 $(\mu_d = 0)$

$H_1 : \mu_1 > \mu_2$
 $(\mu_d > 0)$ ↖ right tail test

Requirement : $n = \# \text{ of pairs} > 30$ or pop. of differences is normal. ✓

Gather : $n = 6 \text{ pairs}$, $\bar{d} = \frac{\sum d}{n} = 1.5$, $S_d = 3.27$
 $\alpha = .05$

Test Statistic : $t = \frac{\bar{d} - \mu_d}{S_d / \sqrt{n}} = \frac{1.5 - 0}{3.27 / \sqrt{6}} = 1.12$
↖ get μ_d from H_0
std. errors

Critical Value

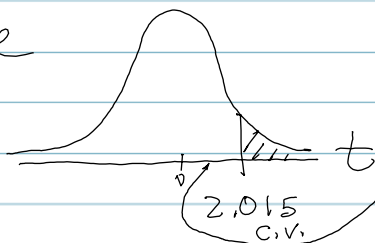
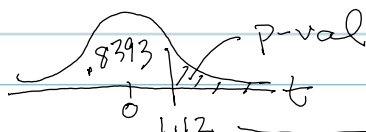


Table A2

$\alpha = .05$
 one tail
 df
 ↓
 $n-1 = 5 \rightarrow 2.015$

P-value (t-distrib → Table A3)



round to nearest tenth

Table A3

TS df → $n-1 = 5$
 ↓
 1.1 → .8393

$P\text{-val} = 1 - .8393 = .1607 > .05 = \alpha \rightarrow \text{Fail to reject } H_0$

Conclusion : The data do not support the claim that counseling lowers mean stress levels.