

t-Test for Correlated Samples

Group 2

Musical Performance Anxiety

1. Perform some preliminary computations.

subject	pretest score	posttest score		
i	X_i	Y_i	D_i	D_i^2
1	18	14	-4	16
2	14	13	-1	1
3	15	16	1	1
4	17	14	-3	9
5	16	18	2	4
6	15	15	0	0
7	24	20.5	-3.5	12.25
8	18	19	1	1
9	14	11	-3	9
10	15	16	1	1
11	16	13	-3	9
12	10	10	0	0
13	14	15	1	1
14	17	17	0	0
15	19	17	-2	4
16	18	18	0	0
17	18	15.5	-2.5	6.25
18	14.5	13	-1.5	2.25

count

N
18

\bar{D}
-0.97

2. Calculate the standard error of the difference between two means when observations are paired.

$$s_D = \sqrt{\frac{\sum_{i=1}^N D_i^2 - \frac{(\sum_{i=1}^N D_i)^2}{N}}{N(N-1)}} = 8.76$$

3. Calculate the t-ratio.

$$t = \frac{\bar{D}}{s_d} = -0.11$$

4. Evaluate the null hypothesis.

$$H_0: \mu_X = \mu_Y$$

$$H_A: \mu_X \neq \mu_Y$$

With 17 degrees of freedom, the critical t -value of 2.110 is required for significance at the .05 level for a two-tailed test.

Since the obtained t -value is -0.11, one would accept the null hypothesis and conclude that the difference between means is not statistically significant.