

t-Test for Correlated Samples

Group 1

Musical Performance Anxiety

1. Perform some preliminary computations.

subject	pretest score	posttest score		
i	X_i	Y_i	D_i	D_i^2
1	17	15	-2	4
2	16	19	3	9
3	13	22	9	81
4	11	17	6	36
5	12	13	1	1
6	8	17	9	81
7	18	16	-2	4
8	13	14	1	1
9	16	22	6	36
10	19	19	0	0
11	16	13	-3	9
12	15	13	-2	4
13	16	15	-1	1
14	20	12	-8	64
15	16	16	0	0
16	18	16	-2	4
17	10	17	7	49

count

N
17

\bar{D}
1.29

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

$$s_D = \sqrt{\frac{\sum_{i=1}^N D_i^2 - \frac{(\sum_{i=1}^N D_i)^2}{N}}{N(N-1)}} = 19.59$$

3. Calculate the t-ratio.

$$t = \frac{\bar{D}}{s_d} = 0.07$$

4. Evaluate the null hypothesis.

$$H_0: \mu_X = \mu_Y$$

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

With 16 degrees of freedom, the critical t -value of 2.120 is required for significance at the .05 level for a two-tailed test.

Since the obtained t -value is 0.07, one would accept the null hypothesis and conclude that the difference between means is not statistically significant.