

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

Social Science Statistics

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

- [Home](#) |
 [Donate](#) |
 [Statistical Test Calculators](#) |
 [Quick P Value Calculators](#) |
 [About](#) |
 [Contact](#)

Donate



Navigation Menu

- ▼ Home
 - ▶ Descriptive Statistics
 - ▶ Mean, Median & Mode Calculator
 - ▶ Variance/Standard Deviation Calc.
 - ▶ Easy Histogram Creator
 - ▶ Easy Bar Chart Creator
 - ▼ Statistical Calculators
 - ▶ Chi^2 for 5 x 5 (or Less) Table
 - ▶ Chi^2 for 2 x 2 Table
 - ▶ Fisher Exact Test for 2 x 2 Table
 - ▶ Chi^2 Goodness of Fit
 - ▶ Student T Test
 - ▶ T Test for Dependent Means
 - ▶ Single Sample T Test
 - ▶ Mann-Whitney U Value
 - ▶ Wilcoxon Signed-Rank
 - ▶ Pearson Correlation Coefficient
 - ▶ Spearman's Rho
 - ▶ Z Test for 2 Population Proportion
 - ▶ Z Test for Single Sample
 - ▼ P Value Calculators
 - ▶ P Value from Z Score
 - ▶ P Value from T Score
 - ▶ P Value from Chi^2 Score
 - ▶ P Value from Pearson r Score

T-Test Calculator for 2 Dependent Means

The value of *t* is -7.872459.

Explanation of results

The output of this calculator is pretty straightforward. The values of *t* and *p* appear at the bottom of the page. If the text is blue, your result is significant; if it's red, it's not. The only thing that might catch you out is the way that we've rounded the data. The data you see in front of you, apart from the *t* and *p* values, has been rounded to 2 significant figures. However, we did not round when actually calculating the values of *t* and *p*. This means that if you try to calculate these values on the basis of the summary data provided here, you're likely going to end up with a slightly different - and less accurate - result.

Treatment 1	Treatment 2	Diff (T2 - T1)	Dev (Diff - M)	Sq. Dev
21.0	20.5	-0.5	-0.06	0.00
21.2	20.6	-0.6	-0.16	0.03
21.2	20.9	-0.3	0.14	0.02
21.4	20.7	-0.7	-0.26	0.07
21.9	21.2	-0.7	-0.26	0.07
20.9	20.4	-0.5	-0.06	0.00
21.1	20.3	-0.8	-0.36	0.13
21.8	21.6	-0.2	0.24	0.06
21.1	21.0	-0.1	0.34	0.12
21.1	20.5	-0.6	-0.16	0.03
20.9	20.5	-0.4	0.04	0.00
21.2	20.9	-0.3	0.14	0.02
20.6	20.5	-0.1	0.34	0.12
21.0	20.6	-0.4	0.04	0.00
20.7	20.3	-0.4	0.04	0.00
		M: -0.44		S: 0.66

Significance Level:

- 0.01
 0.05
 0.10

One-tailed or two-tailed hypothesis?:

- One-tailed
 Two-tailed

Difference Scores Calculations

Mean: -0.44
 $\mu = 0$
 $S^2 = SS/df = 0.66/(15-1) = 0.05$
 $S^2_M = S^2/N = 0.05/15 = 0.00$
 $S_M = \sqrt{S^2_M} = \sqrt{0.00} = 0.06$

T-value Calculation

$t = (M - \mu)/S_M = (-0.44 - 0)/0.06 = -7.87$

The value of *t* is -7.872459. The value of *p* is < 0.00001. The result is significant at $p \leq 0.05$.