

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

Social Science Statistics

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

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Wilcoxon Signed-Rank Test Calculator

Note: You can find further information about this calculator, [here](#).

Success!

Explanation of results

We have calculated both a W-value and Z-value. If the size of N is at least 20 - see the Results Details box - then the distribution of the Wilcoxon W statistic tends to form a normal distribution. This means you can use the Z-value to evaluate your hypothesis. If, on the other hand, the size of N is low, and particularly if it's below 10, you should use the W-value to evaluate your hypothesis.

You should also note that if a subject's difference score is zero - that is, if a subject has the same score in both treatment conditions - then the test discards the individual from the analysis and reduces the sample size. If you have a lot of ties, this procedure will undermine the reliability of the test (and also suggests that the requirement that the data is continuous has not been met).

Treatment 1	Treatment 2	Sign	Abs	R	Sign R
0.75194810859	0.72736951147	1	0.0246	7	7
31128	05357	1	0.0101	3	3
0.76935969221	0.75925462937	1	0.04	10	10
24725	59325	-1	0.0386	8	-8
0.73279998647	0.69284087754	1	0.0002	1	1
03347	60189	-1	0.0219	6	-6
0.72546369169	0.76406594133	-1	0.2354	20	-20
8268	46723	1	0.0058	2	2
0.76511967041	0.76495492455	-1	0.043	12	-12
4759	81874	-1	0.039	9	-9
0.71433350792	0.73619439395	1	0.1085	17	17
9199	93852	1	0.0488	14	14
0.66516116477	0.90060700090	1	0.1348	19	19
23292	21285	-1	0.0614	15	-15
0.80956520136	0.80379961514	-1	0.1125	18	-18
92538	63891	1	0.0654	16	16
0.72971906895	0.77270866072	-1	0.0109	4	-4
10819	01169	1	0.0479	13	13
0.72968103259	0.76866878853	-1	0.0401	11	-11
96755	8462	1	0.0135	5	5
0.78697758583	0.67846829615				
83603	41552				

Significance Level:
☐ 0.01
☒ 0.05
 1 or 2-tailed hypothesis?:
☐ One-tailed
☒ Two-tailed

Result Details
 W-value: 103
 Mean Difference: 0
 Sum of pos. ranks: 107
 Sum of neg. ranks: 103

 Z-value: -0.0747
 Mean (W): 105
 Standard Deviation (W): 26.79

 Sample Size (N): 20

Result 1 - Z-value
 The Z-value is -0.0747. The p-value is 0.9442. The result is *not* significant at p ≤ 0.05.

Result 2 - W-value
 The W-value is 103. The critical value of W for N = 20 at p ≤ 0.05 is 52. Therefore, the result is *not* significant at p ≤ 0.05.

Calculate

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