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

Social Science Statistics

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

Wilcoxon Signed-Rank Test Calculator

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*
0.91833459583501	0.90658052759931	1	0.0118	7	7
331,	746,	n/a	0	n/a	n/a
0.90823762517421	0.85438951811511	1	0.0538	16	16
517,	872,	n/a	0	n/a	n/a
0.92290971621201	0.87061232702481	1	0.0523	15	15
01,	18,	n/a	0	n/a	n/a
0.83268767079441	0.85774756331309	-1	0.0251	10	-10
4,	07,	n/a	0	n/a	n/a
0.85618504953586	0.86224346313735	-1	0.0061	4	-4
09,	38,	n/a	0	n/a	n/a
0.91257467045076	0.84991163769616	1	0.0627	20	20
33,	69,	n/a	0	n/a	n/a
0.92800253771044	0.85560354676952	1	0.0724	26	26
43,	52,	n/a	0	n/a	n/a
0.86234824261522	0.92404725005533	-1	0.0617	19	-19
49,	62,	n/a	0	n/a	n/a
0.84989307109106	0.91150008167558	-1	0.0616	18	-18
73,	38,	n/a	0	n/a	n/a
0.84212259771007	0.91595918833591	-1	0.0738	27	-27
35,	02,	n/a	0	n/a	n/a
0.84779955989750	0.91258566028120	-1	0.0648	22	-22
77,	35,	n/a	0	n/a	n/a
0.91767131631936	0.91935522850150	-1	0.0017	2	-2
26,	09,	n/a	0	n/a	n/a
0.91154347811079	0.86339931863260	1	0.0481	14	14

Significance Level:
- (•) 0.01
- ( ) 0.05

1 or 2-tailed hypothesis?:
- ( ) One-tailed
- (•) Two-tailed

Result Details

W-value: 209
Mean Difference: 0.88
Sum of pos. ranks: 209
Sum of neg. ranks: 256

Z-value: -0.4834
Mean (*W*): 232.5
Standard Deviation (*W*): 48.62

Sample Size (*N*): 30

Result 1 - Z-value

The Z-value is -0.4834. The p-value is 0.63122. The result is *not* significant at p≤ 0.01.

Result 2 - W-value

The W-value is 209. The critical value of *W* for *N* = 30 at p≤ 0.01 is 109. Therefore, the result is *not* significant at p≤ 0.01.

Calculate Reset