RESEARCH METHODS · IAL WPS01

The Wilcoxon Test: Step by Step

Difference · repeated measures or matched pairs · ordinal data or above.

1. **Find each difference** (condition A − condition B).
2. **Drop the zeros** and reduce N.
3. **Rank the differences ignoring the sign.** Smallest = 1. Ties share the average rank.
4. **Add the ranks** for positive and negative differences separately.
5. **T = the smaller total.** Significant if T is **equal to or less than** the critical value.

Sense check: the two totals add up to N(N + 1) ÷ 2.

Worked example (silence − music, words recalled)

P	1	2	3	4	5	6	7	8	9	10
Diff	+3	+5	−1	0	+2	+4	+6	+1	+3	−2
Rank	5.5	8	1.5	–	3.5	7	9	1.5	5.5	3.5

N = 9 · negative ranks = 5 · positive ranks = 40 · **T = 5** · critical value (N = 9, p ≤ 0.05, two-tailed) = 5 · 5 ≤ 5 → **significant**.

N	p ≤ 0.05 (one-tailed)	p ≤ 0.05 (two-tailed)
6	2	0
7	3	2
8	5	3
9	8	5
10	10	8
11	13	10
12	17	13

Excerpt of critical values. Always use the table printed in your exam paper.

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RESEARCH METHODS · PRACTICE

Your Turn

Calculate T and decide whether the result is significant (one-tailed, $p \leq 0.05$).

P	1	2	3	4	5	6	7	8	9
Quiet	14	12	15	10	13	11	16	12	14
Noise	11	12	10	9	14	8	12	9	10

Answers: differences 3, 0, 5, 1, −1, 3, 4, 3, 4 · drop the zero, N = 8 · ranks: 1s → 1.5 each; 3s → 4 each; 4s → 6.5 each; 5 → 8 · negative total = 1.5 · positive total = 34.5 · **T = 1.5** · critical value (N = 8, one-tailed) = 5 · 1.5 ≤ 5, so significant.

Remember the rule

Test	Significant if the calculated value is...
Chi-squared	Equal to or greater than the critical value
Spearman's rho	Equal to or greater than the critical value
Wilcoxon (T)	Equal to or less than the critical value
Mann-Whitney (U)	Equal to or less than the critical value

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