

Kendall's W Coefficient of Concordance

Standalone verified Python analysis

Test: Kendall's W Coefficient of Concordance

Design: Agreement/effect-size analysis of within-student rankings across G1, G2, and G3.

Variables: G1, G2, G3

Null hypothesis: The repeated grade occasions show no concordant ordering beyond chance.

Formula: $W = Q_{\text{Friedman}}/[n(k-1)]$

Source rows: 649

Calculated metrics:

kendalls_w: 0.12891238625304033

friedman_chi_square: 167.32827735644634

p_value: 4.625154438692089e-37

n_blocks: 649

k_occasions: 3

Independent reference values:

kendalls_w: 0.12891238625304033

friedman_chi_square: 167.32827735644634

p_value: 4.625154438692089e-37

n_blocks: 649

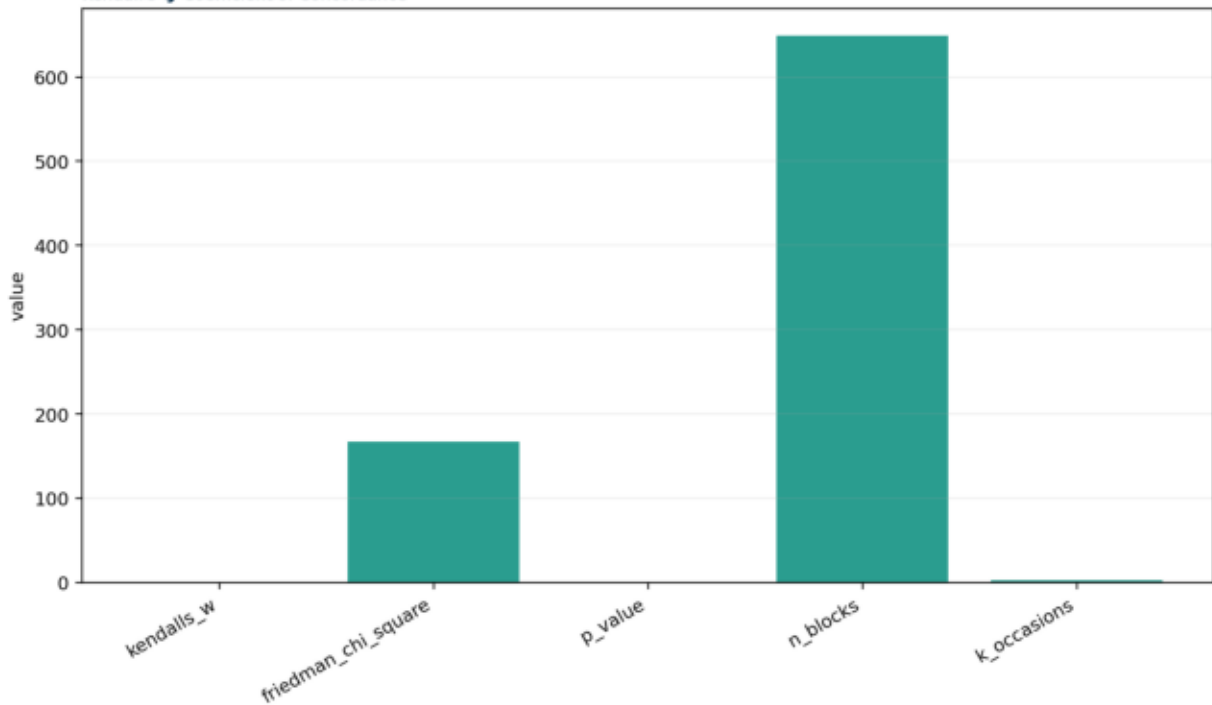
k_occasions: 3

Interpretation:

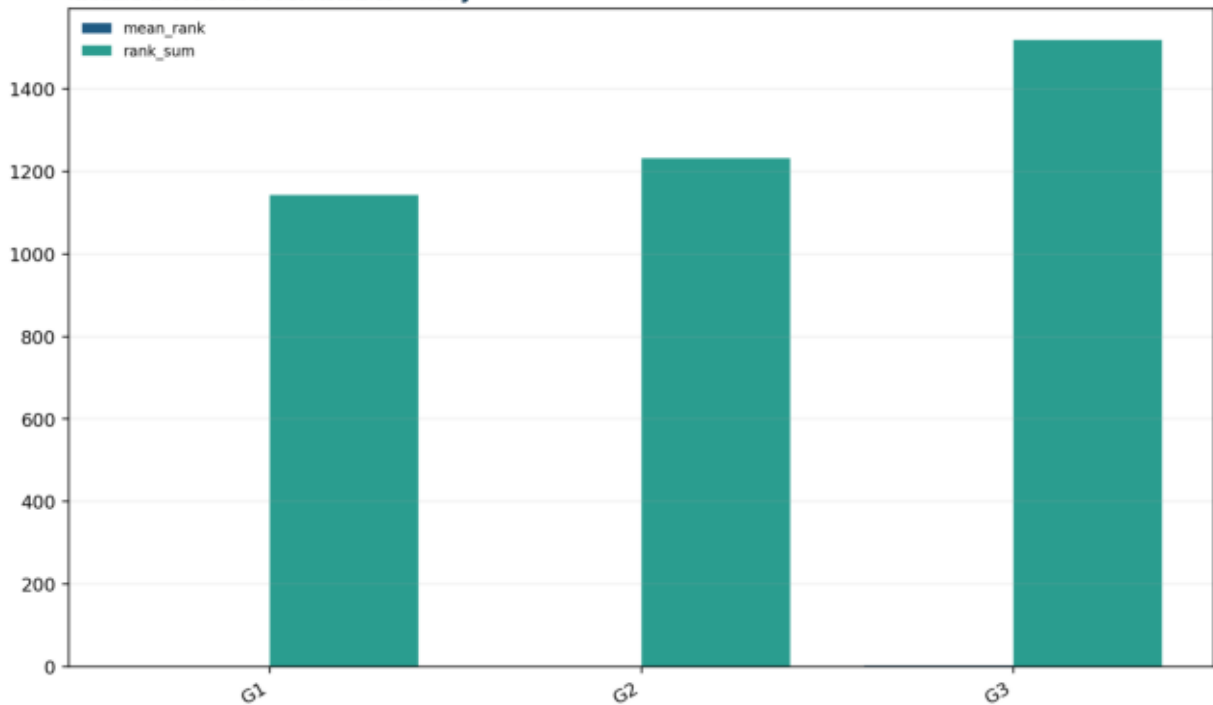
Kendall's W is 0.128912 on a 0-to-1 concordance scale.

The Friedman chi-square supplies the inferential test while W supplies effect magnitude.

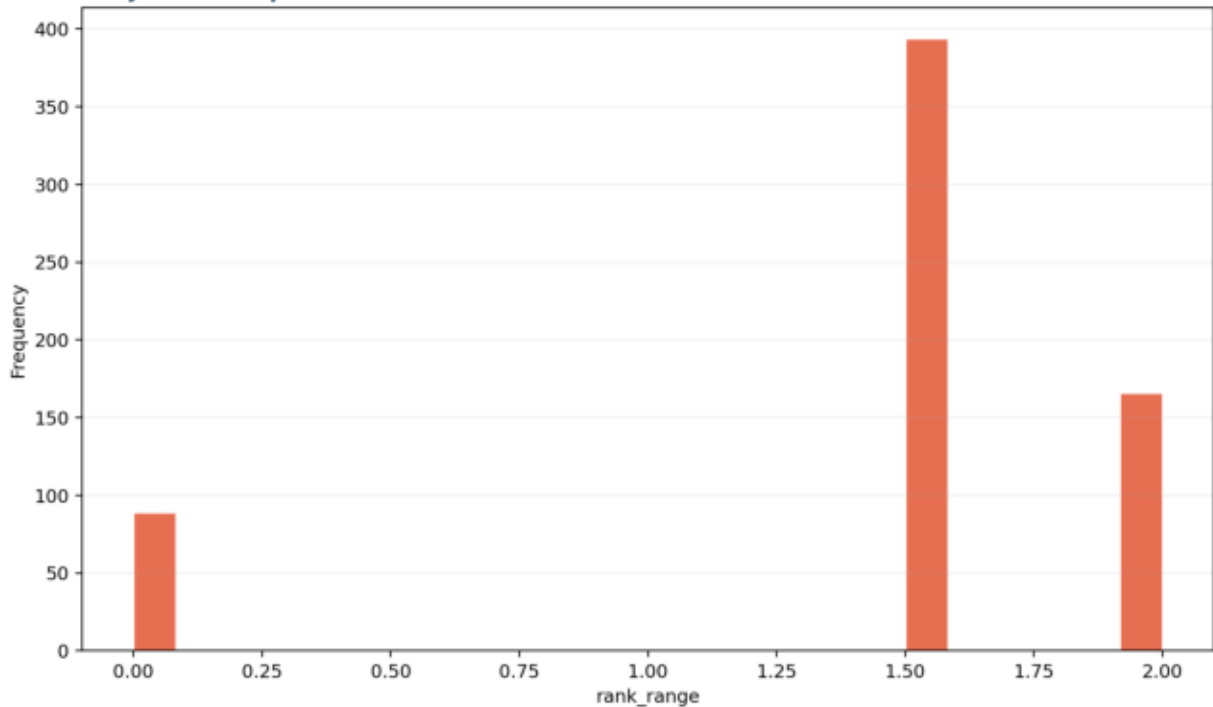
Primary Metrics



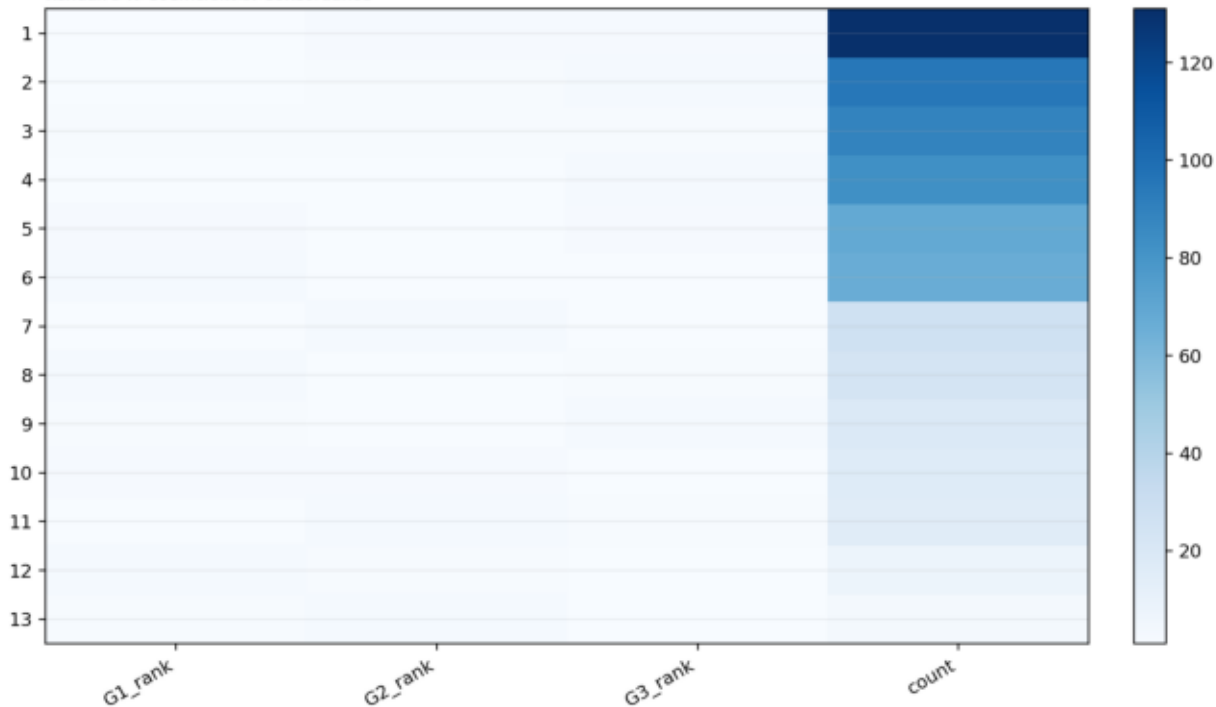
Occasion Concordance Summary



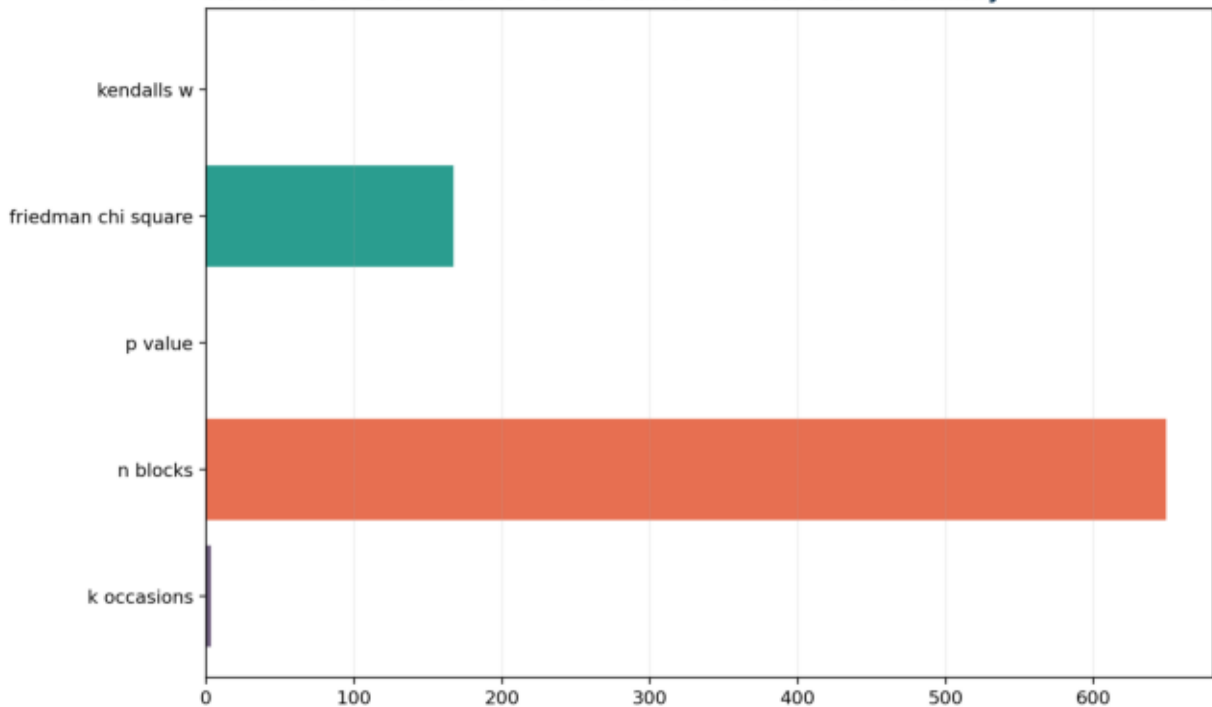
Subject Rank Spread



Rank Pattern Counts



Kendall's W Coefficient of Concordance verified result summary



Primary Metrics

metric	value
kendalls_w	0.128912
friedman_chi_square	167.328
p_value	4.62515e-37
n_blocks	649
k_occasions	3

Occasion Concordance Summary

occasion	mean_rank	rank_sum
G1	1.76117	1143
G2	1.89831	1232
G3	2.34052	1519

Subject Rank Spread

rank_range	grade_range
1.5	11
1.5	2
1.5	1
0	0
1.5	2
1.5	1
1.5	1
1.5	3
2	2
1.5	1
0	0
2	3
1.5	1
1.5	1
1.5	1
0	0
1.5	1
1.5	1
1.5	1
0	0
2	2
1.5	1
2	2
0	0
1.5	1
2	2

Rank Pattern Counts

G1_rank	G2_rank	G3_rank	count
1	2.5	2.5	131
1	2	3	95
2	2	2	89
1.5	1.5	3	83
2.5	1	2.5	69
3	1.5	1.5	67
1.5	3	1.5	27
3	1	2	24
2	1	3	19
2.5	2.5	1	17
1	3	2	16
3	2	1	8
2	3	1	4