

Quadratic Weighted Kappa

Standalone verified Python analysis

Test: Quadratic Weighted Kappa

Design: Ordinal agreement between five-category G1 and G3 ratings with quadratic disagreement penalties.

Variables: five-category G1, five-category G3

Null hypothesis: Observed quadratic disagreement equals chance disagreement from the margins.

Formula: $\text{kappa}_w = 1 - \frac{\sum w_{ij} O_{ij}}{\sum w_{ij} E_{ij}}$, $w_{ij} = (i-j)^2 / (q-1)^2$.

Source rows: 649

Calculated metrics:

quadratic_weighted_kappa: 0.8273389742088233

observed_weighted_disagreement: 0.034476117103235754

expected_weighted_disagreement: 0.1996751550922244

categories: 5

n_pairs: 649

Independent reference values:

quadratic_weighted_kappa: 0.8273389742088233

observed_weighted_disagreement: 0.034476117103235754

expected_weighted_disagreement: 0.1996751550922244

categories: 5

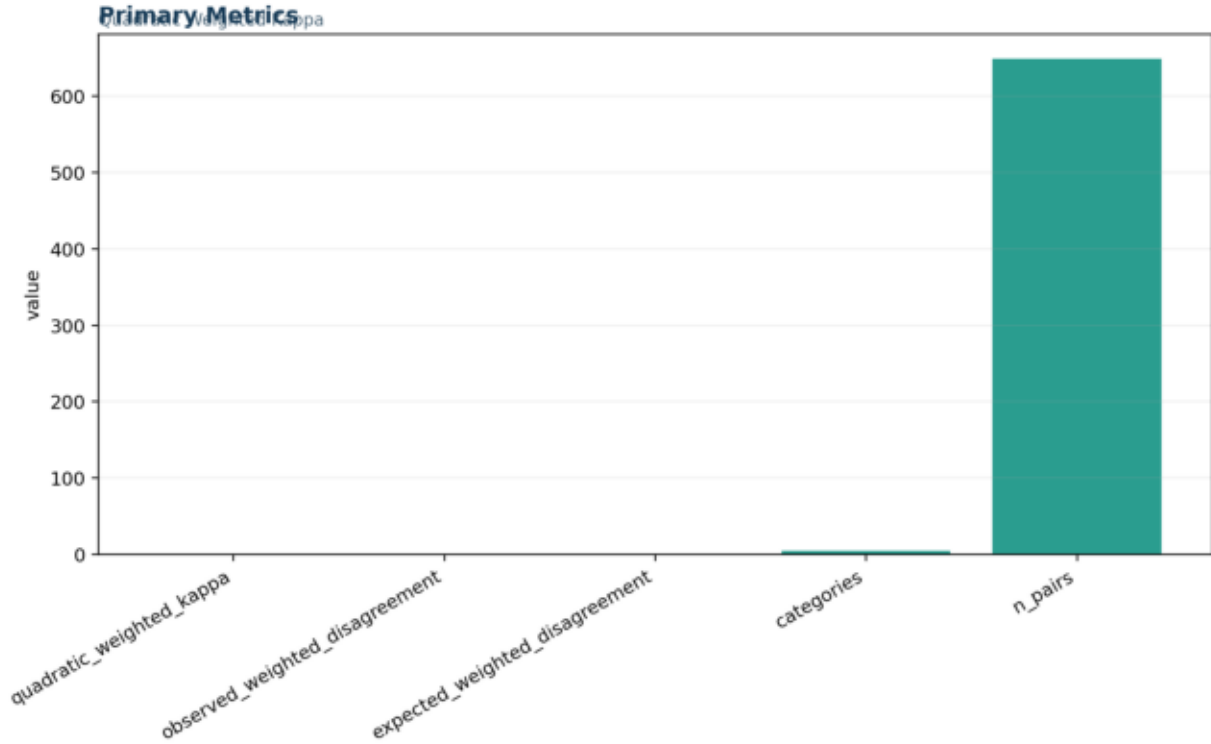
n_pairs: 649

Interpretation:

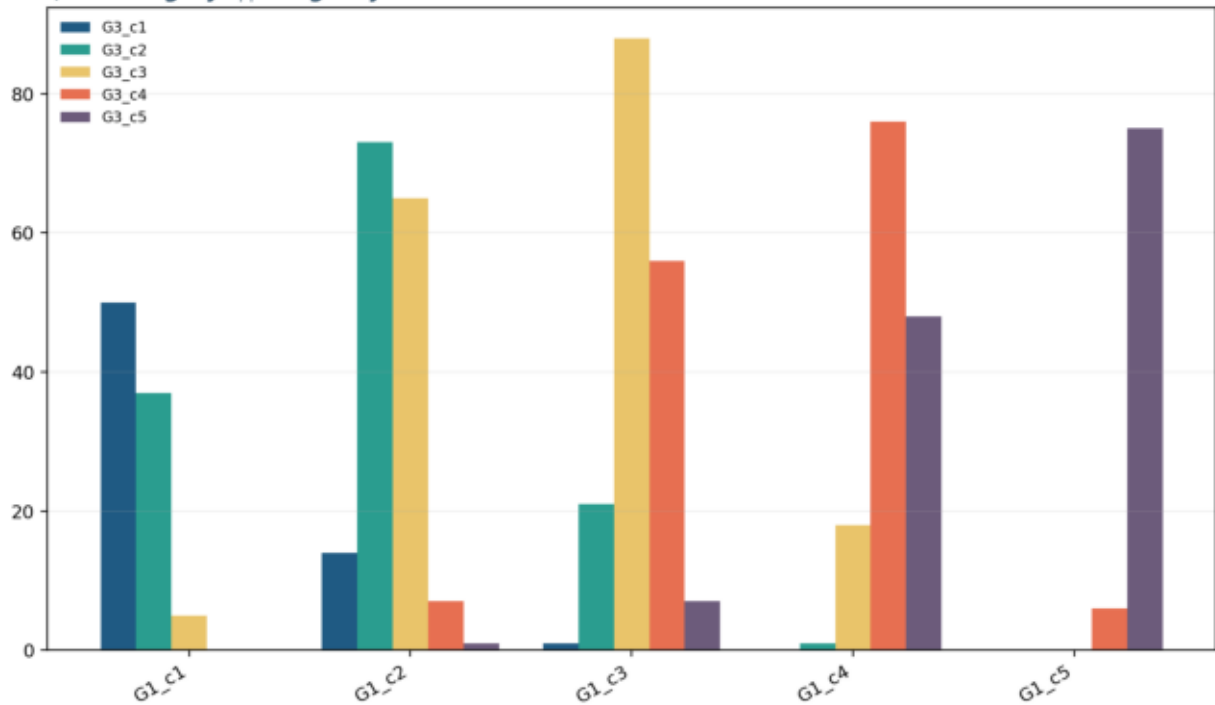
Quadratic penalties preserve ordinal distance among the five categories.

Quadratic weighted kappa=0.827339.

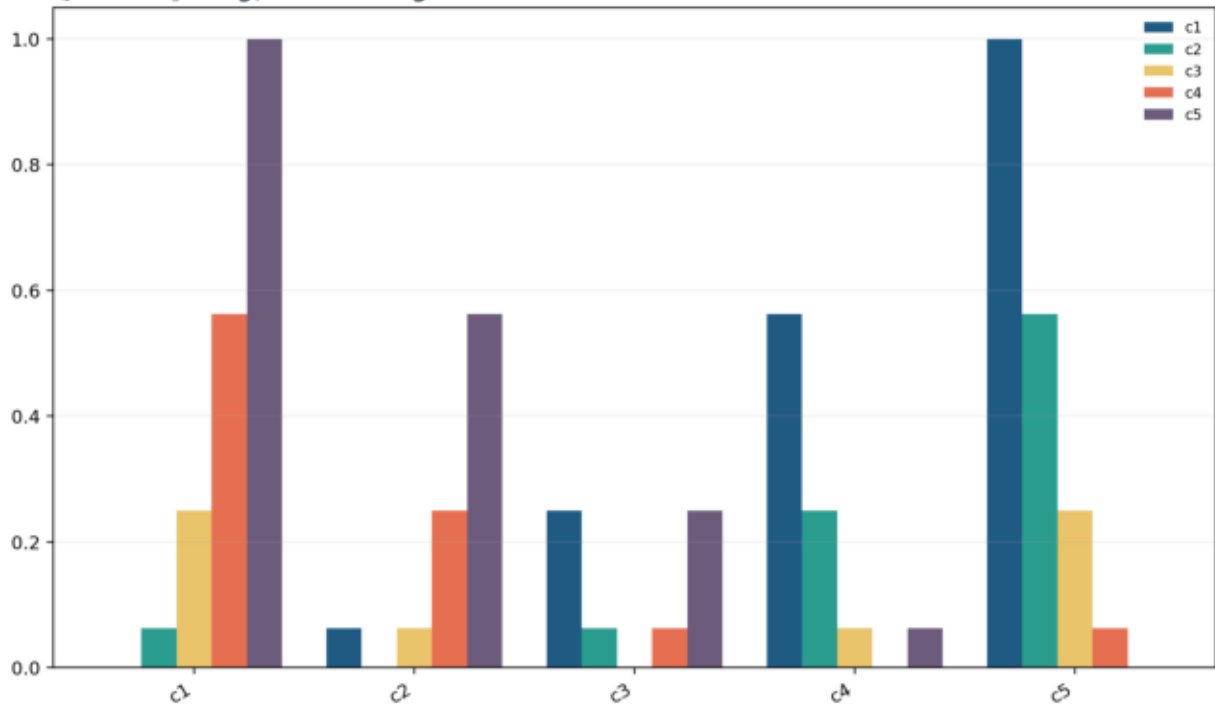
Primary Metrics



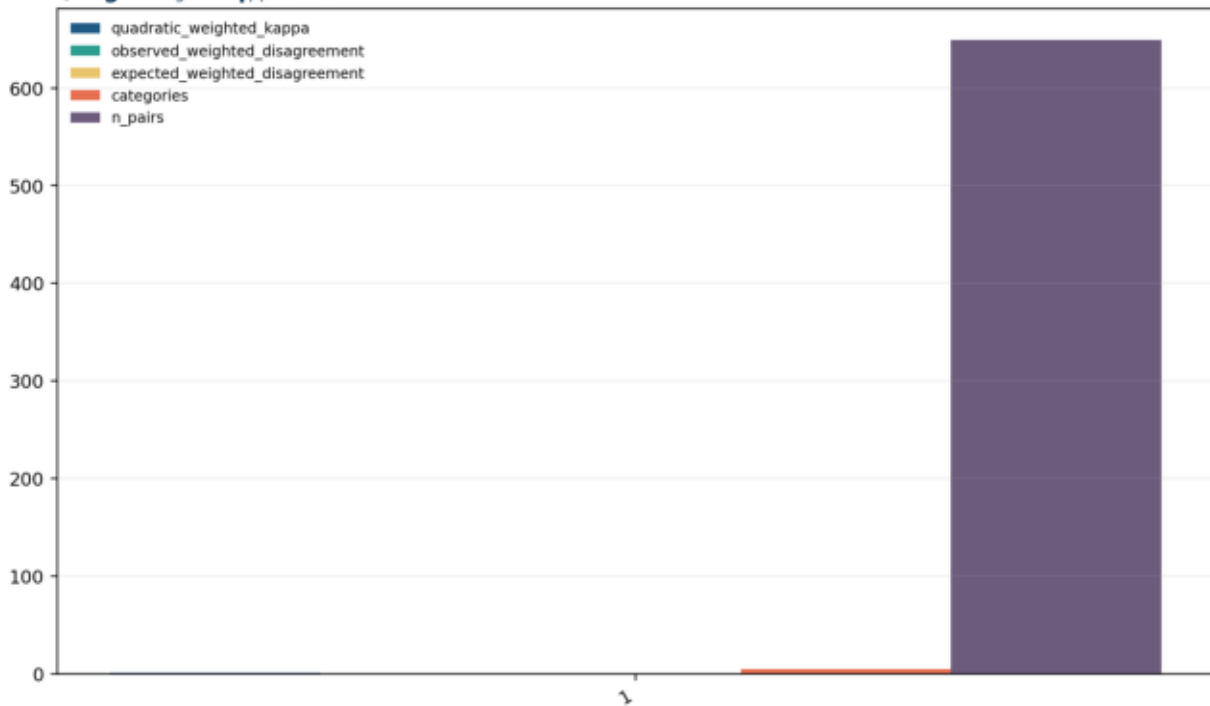
Five-Category Contingency



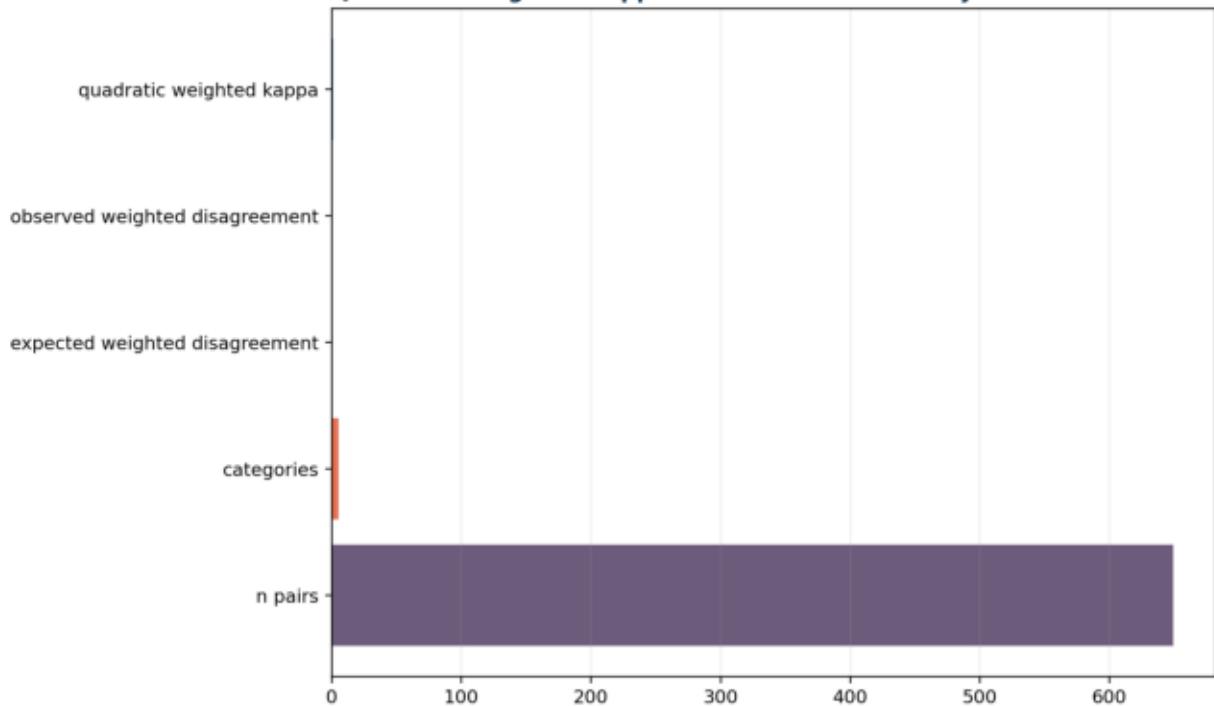
Quadratic Disagreement Weights



Weighted Components



Quadratic Weighted Kappa verified result summary



Primary Metrics

metric	value
quadratic_weighted_kappa	0.827339
observed_weighted_disagreement	0.0344761
expected_weighted_disagreement	0.199675
categories	5
n_pairs	649

Five Category Contingency

index	G3_c1	G3_c2	G3_c3	G3_c4	G3_c5
G1_c1	50	37	5	0	0
G1_c2	14	73	65	7	1
G1_c3	1	21	88	56	7
G1_c4	0	1	18	76	48
G1_c5	0	0	0	6	75

Quadratic Disagreement Weights

index	c1	c2	c3	c4	c5
c1	0	0.0625	0.25	0.5625	1
c2	0.0625	0	0.0625	0.25	0.5625
c3	0.25	0.0625	0	0.0625	0.25
c4	0.5625	0.25	0.0625	0	0.0625
c5	1	0.5625	0.25	0.0625	0

Weighted Components

quadratic_weighted_kappa	served_weighted_disagree	expected_weighted_disagree	categories	n_pairs
0.827339	0.0344761	0.199675	5	649