

# Quadratic Weighted Kappa

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

Source rows: 649

Calculated metrics:

quadratic\_weighted\_kappa: 0.827338974208823

observed\_weighted\_disagreement: 0.0344761171032357

expected\_weighted\_disagreement: 0.199675155092224

categories: 5

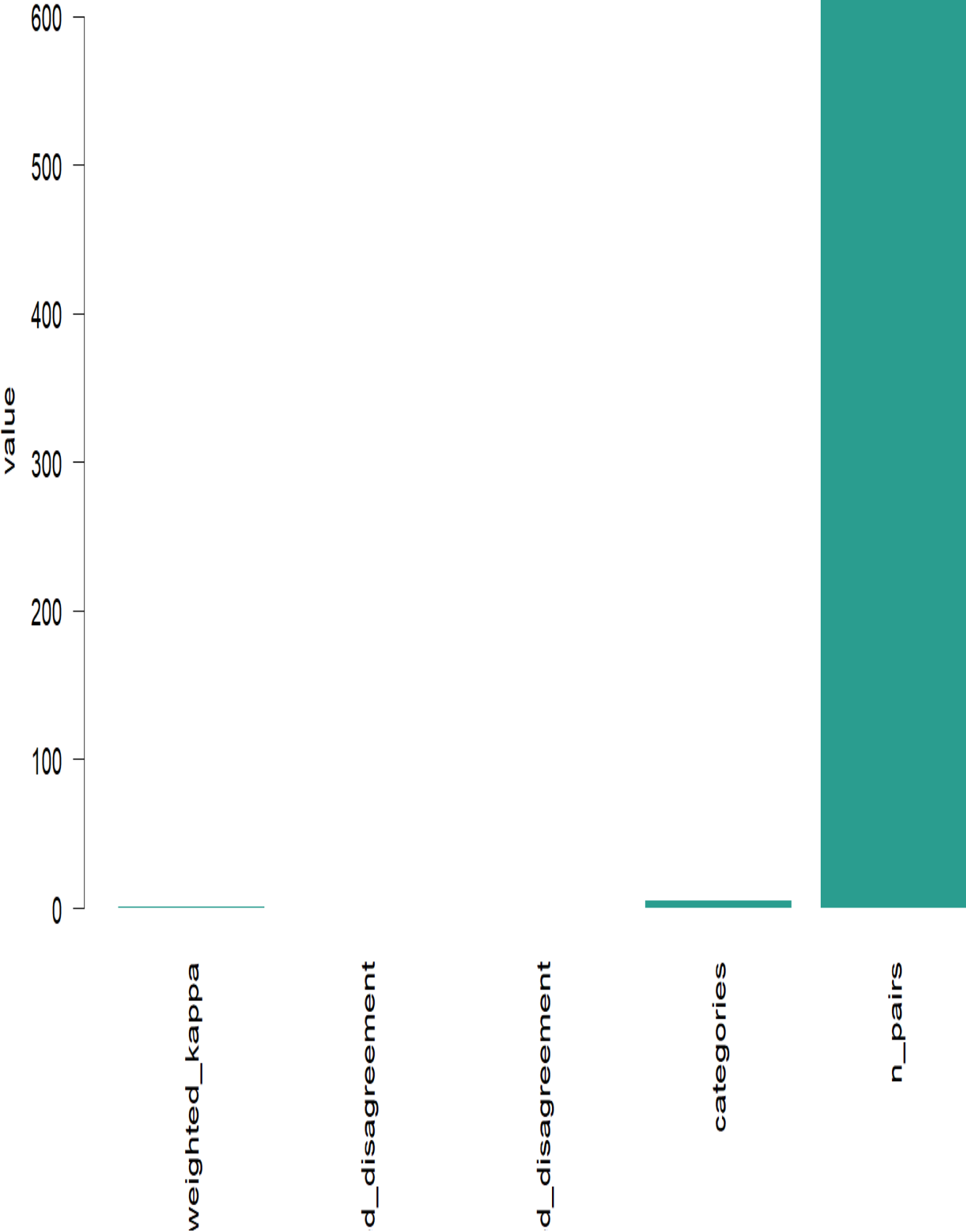
n\_pairs: 649

Interpretation:

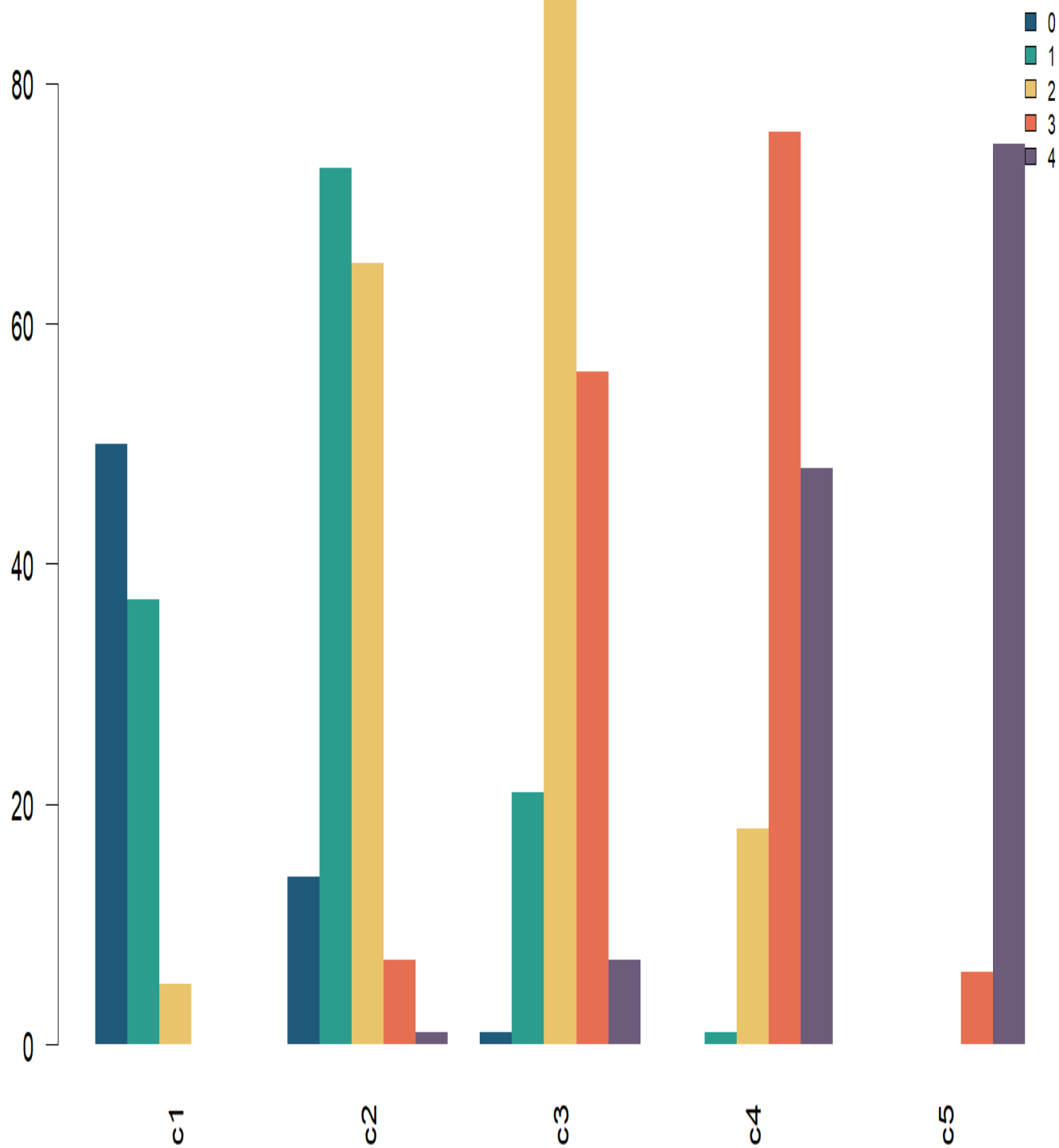
Quadratic penalties preserve ordinal distance among five grade categories.

Quadratic weighted kappa 0.827338974208823

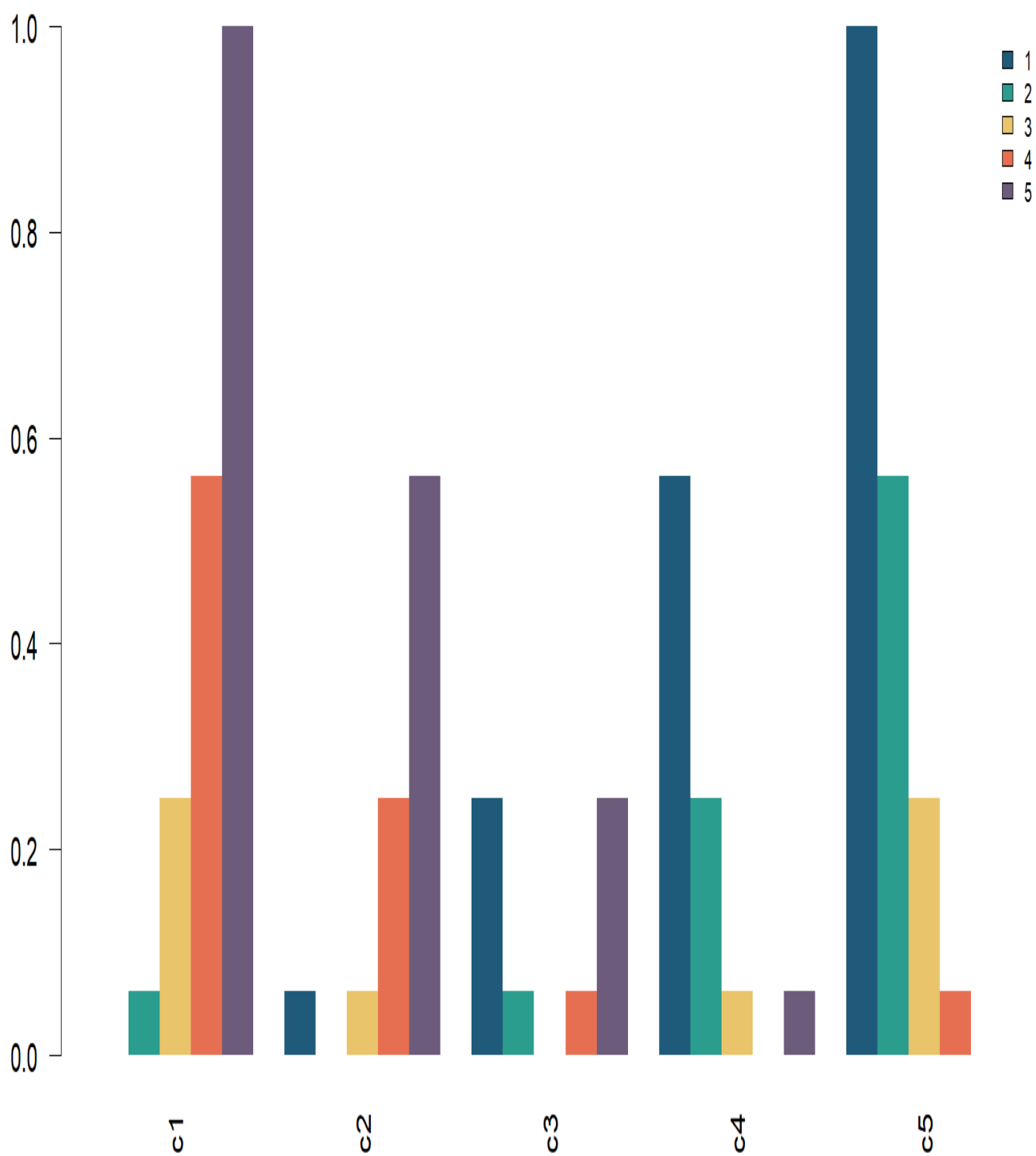
Quadratic Weighted Kappa - primary metrics



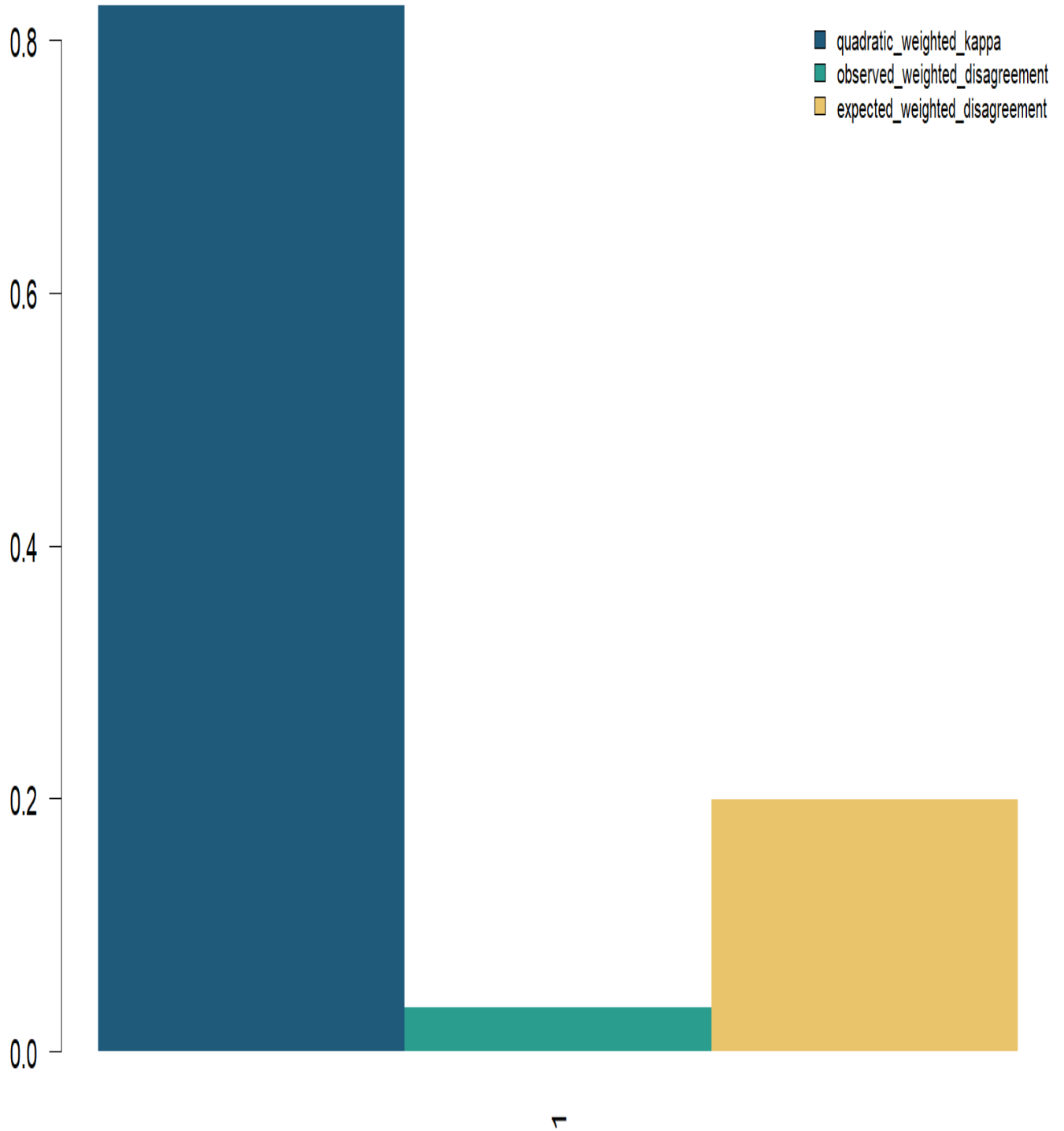
Quadratic Weighted Kappa - five category contingency



Quadratic Weighted Kappa - quadratic disagreement weights



## Quadratic Weighted Kappa - weighted components



## Quadratic Weighted Kappa verified results

n\_pairs



categories



ected\_weighted\_disagreement

erved\_weighted\_disagreement

quadratic\_weighted\_kappa



0

100

200

300

400

500

600