

Minimum-Residual Factor Analysis

Test: Minimum-Residual Factor Analysis

Design: Two-factor MINRES solution with oblimin rotation, matching a common R psych workflow.

Variables: G1, G2, G3, famrel, freetime, goout

Null hypothesis: The off-diagonal residual objective is not improved by two common factors.

Formula: Minimize $\sum_{i < j} (r_{ij} - [\Lambda \Lambda']_{ij})^2$, then oblimin rotate.

Source rows: 649

Calculated metrics:

factors: 2

minres_residual_sum_squares: 0.000536314535255646

mean_communality: 0.566842520072476

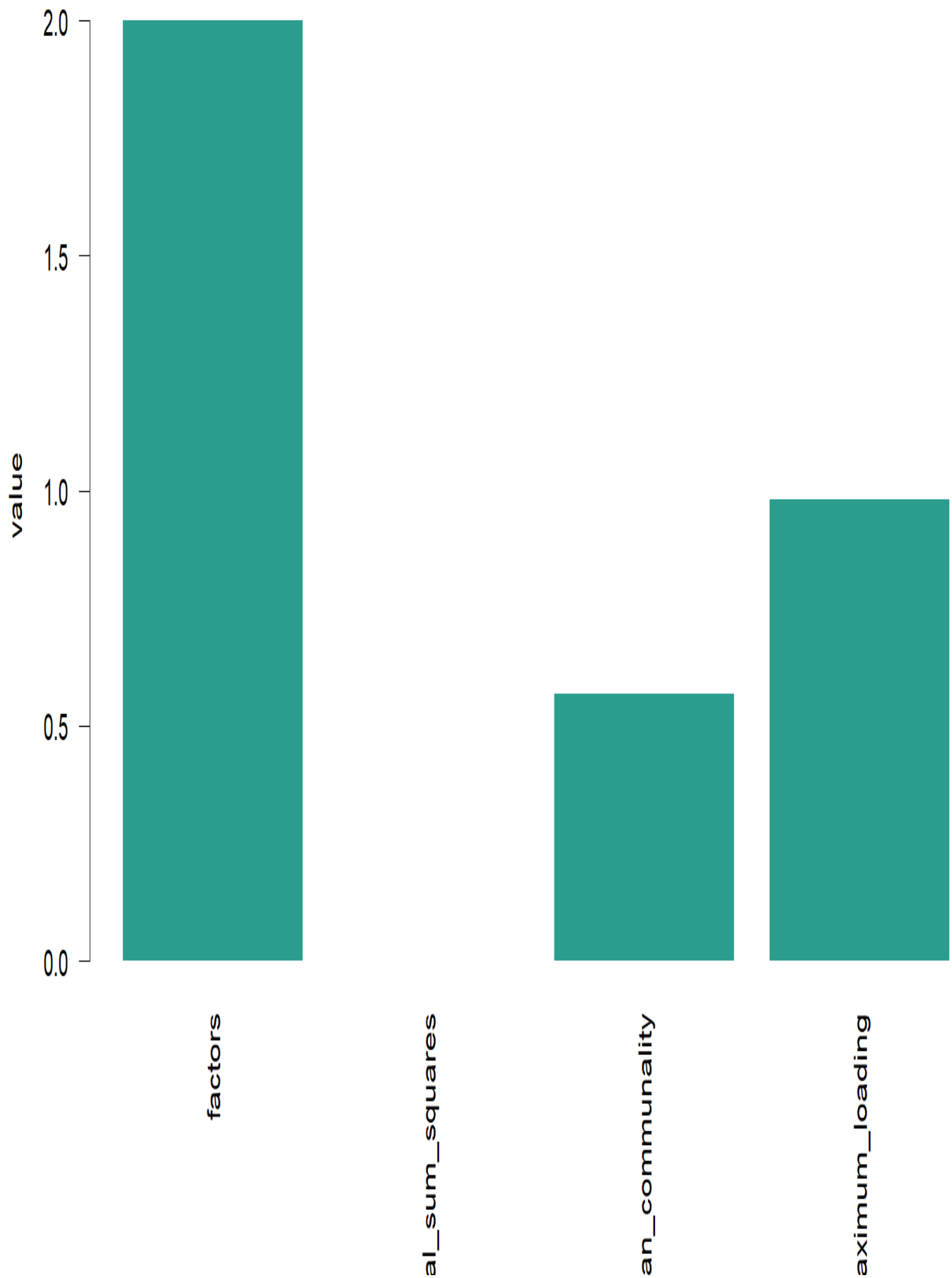
maximum_loading: 0.980284998536905

Interpretation:

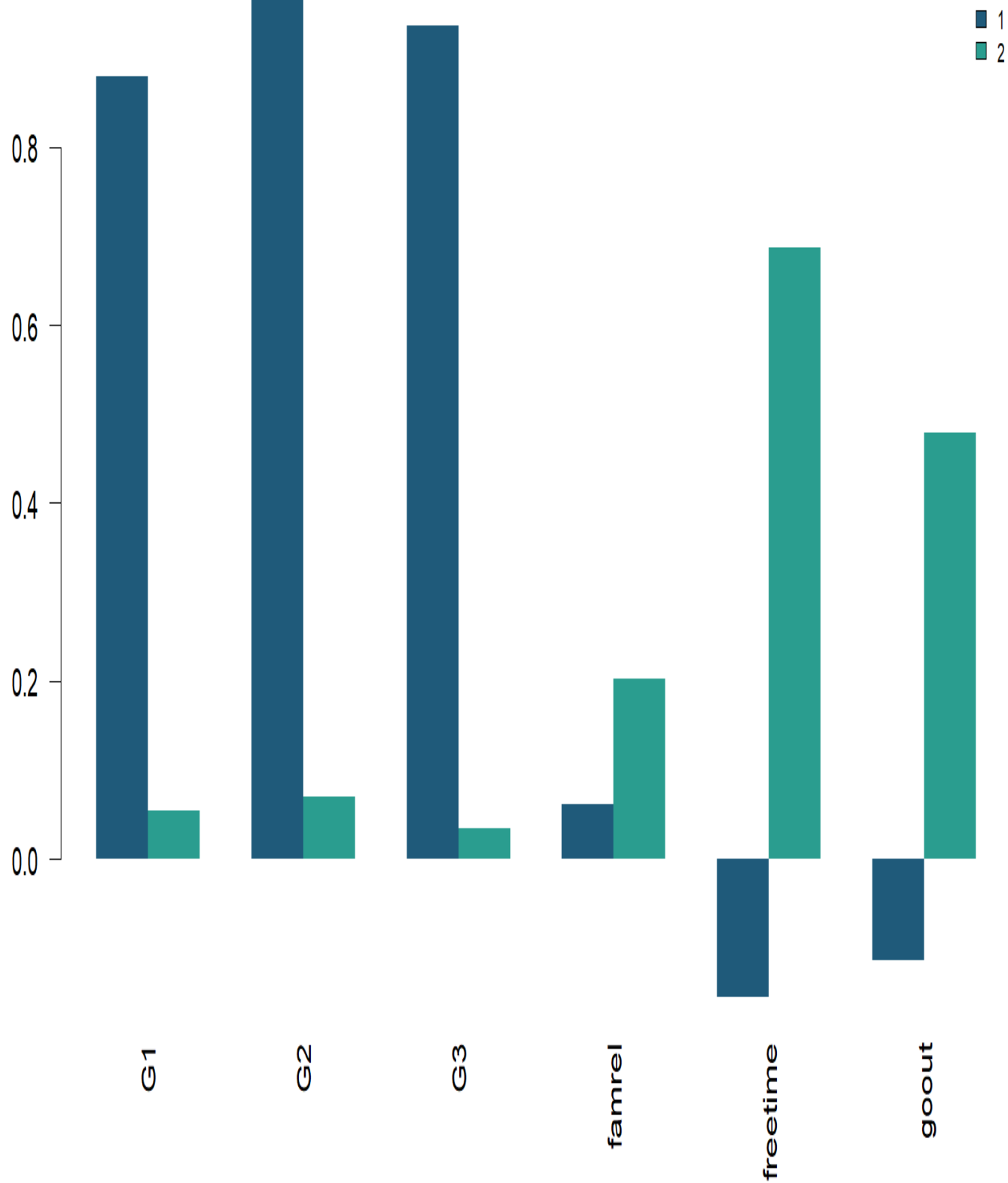
R MINRES minimizes off-diagonal residuals.

Residual SS 0.000536314535255646

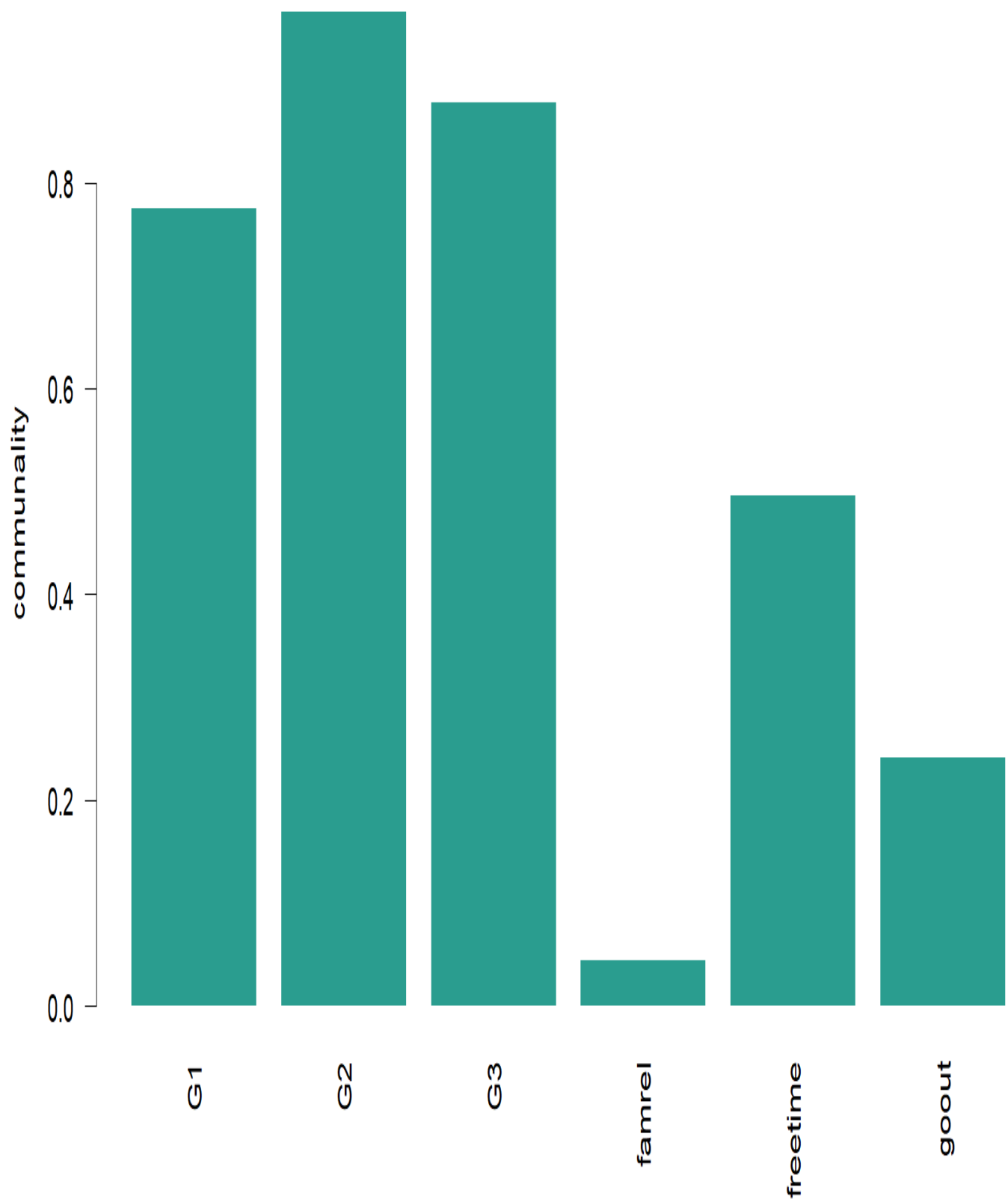
Minimum-Residual Factor Analysis - primary metrics



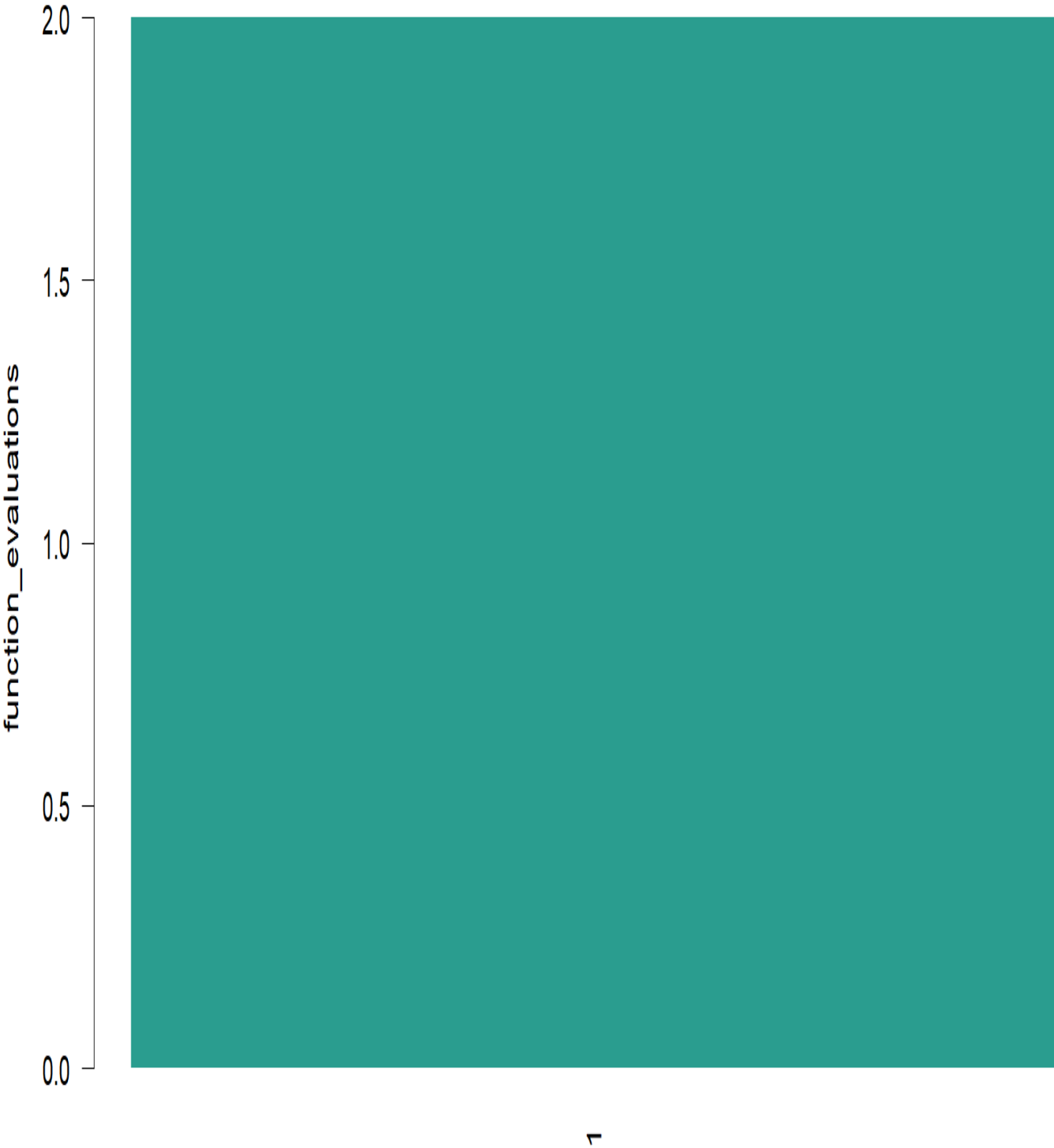
Minimum-Residual Factor Analysis - r minres loadings



Minimum-Residual Factor Analysis - minres communalities



Minimum-Residual Factor Analysis - minres optimizer diagnostics



Minimum-Residual Factor Analysis verified results

maximum_loading



mean_communality



ninres_residual_sum_squares

factors



0.0

0.5

1.0

1.5

2.0