

Promax Oblique Rotation

Standalone verified Python analysis

Test: Promax Oblique Rotation

Design: Power-four target rotation of an initial varimax principal-axis solution.

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

Null hypothesis: Promax does not produce a simpler correlated-factor pattern.

Formula: $\text{Target}_{ij} = \text{sign}(l_{ij})|l_{ij}|^4$; regress target on varimax loadings to obtain oblique transform.

Source rows: 649

Calculated metrics:

power: 4

factor_correlation: -0.6525460186327302

maximum_pattern_loading: 0.808825179126963

cross_loading_items: 0

Independent reference values:

power: 4

factor_correlation: -0.6525460186327302

maximum_pattern_loading: 0.808825179126963

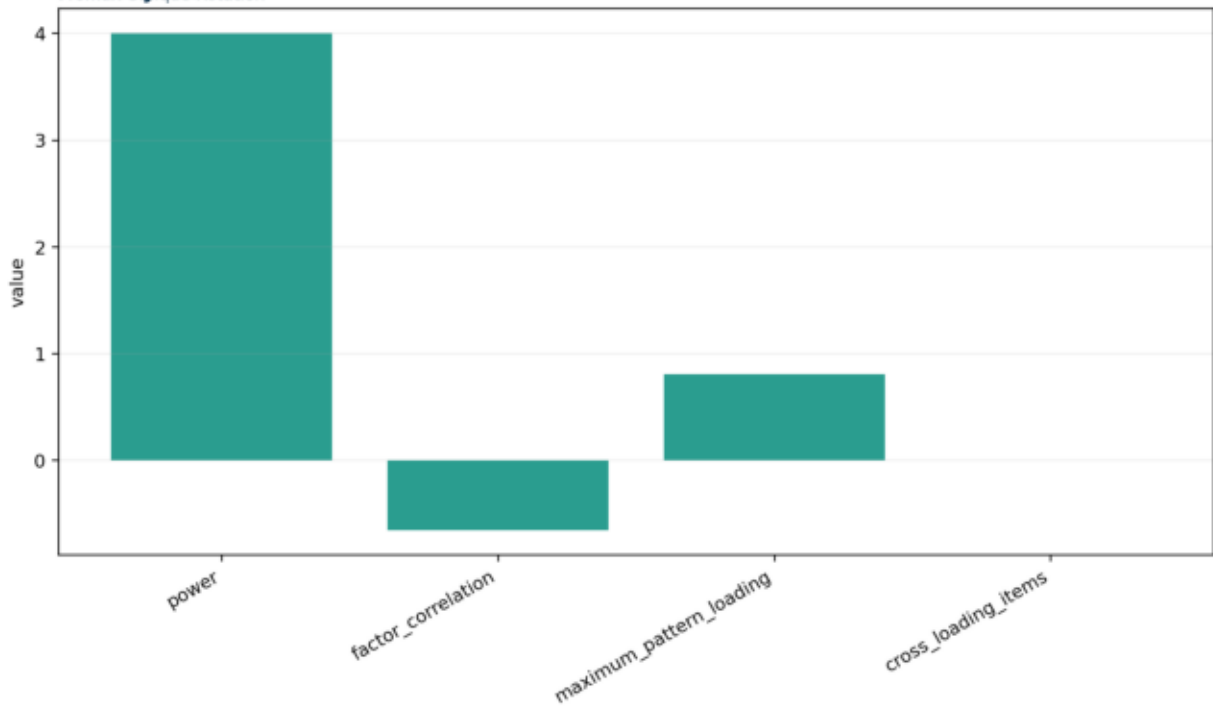
cross_loading_items: 0

Interpretation:

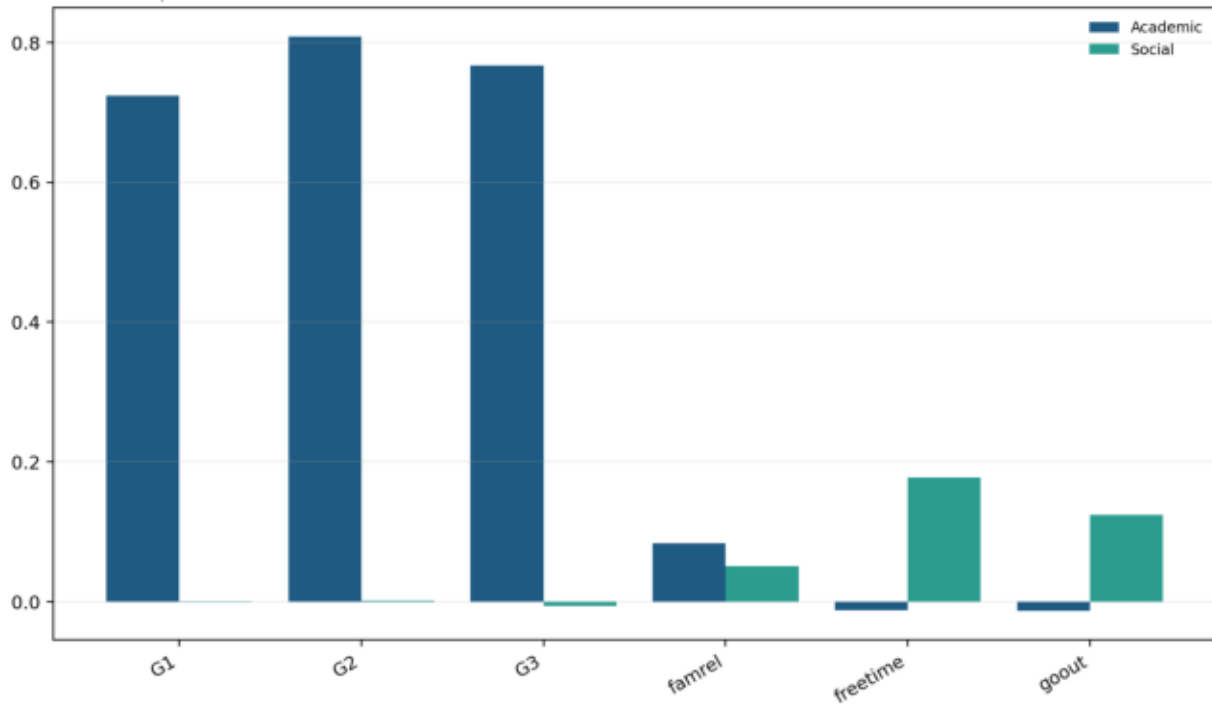
Promax raises the varimax target to power four and then permits factor correlation.

Promax factor correlation=-0.652546.

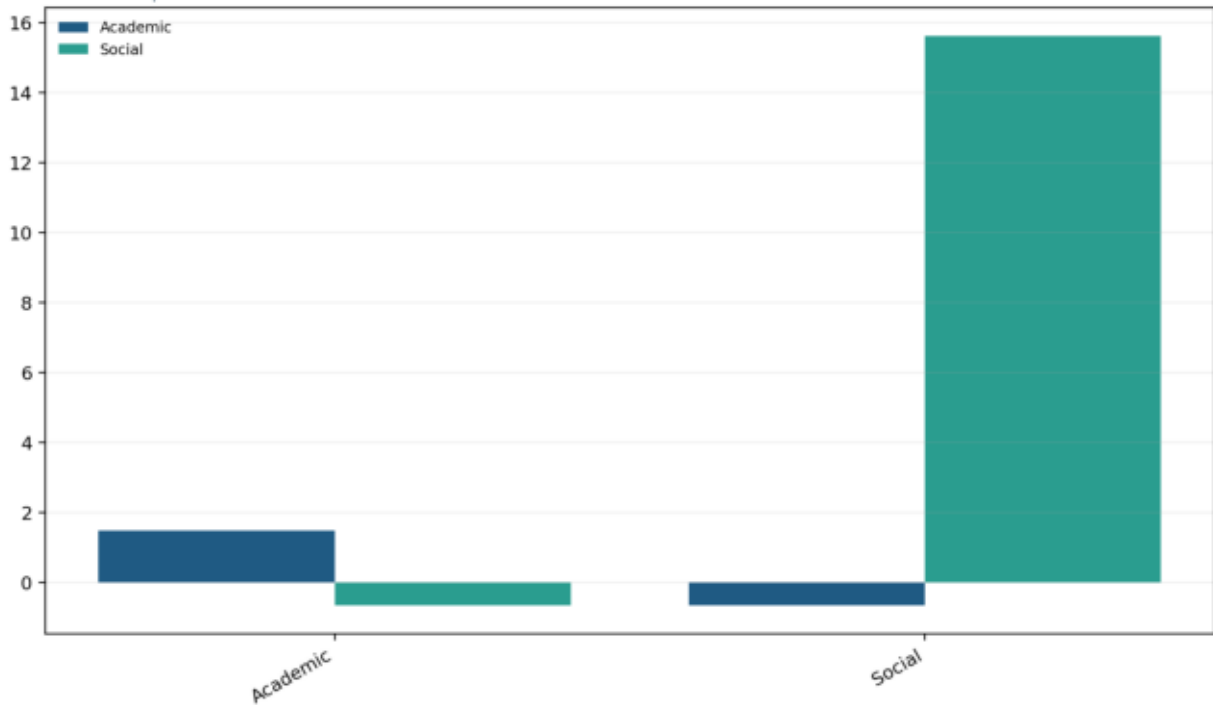
Primary Metrics



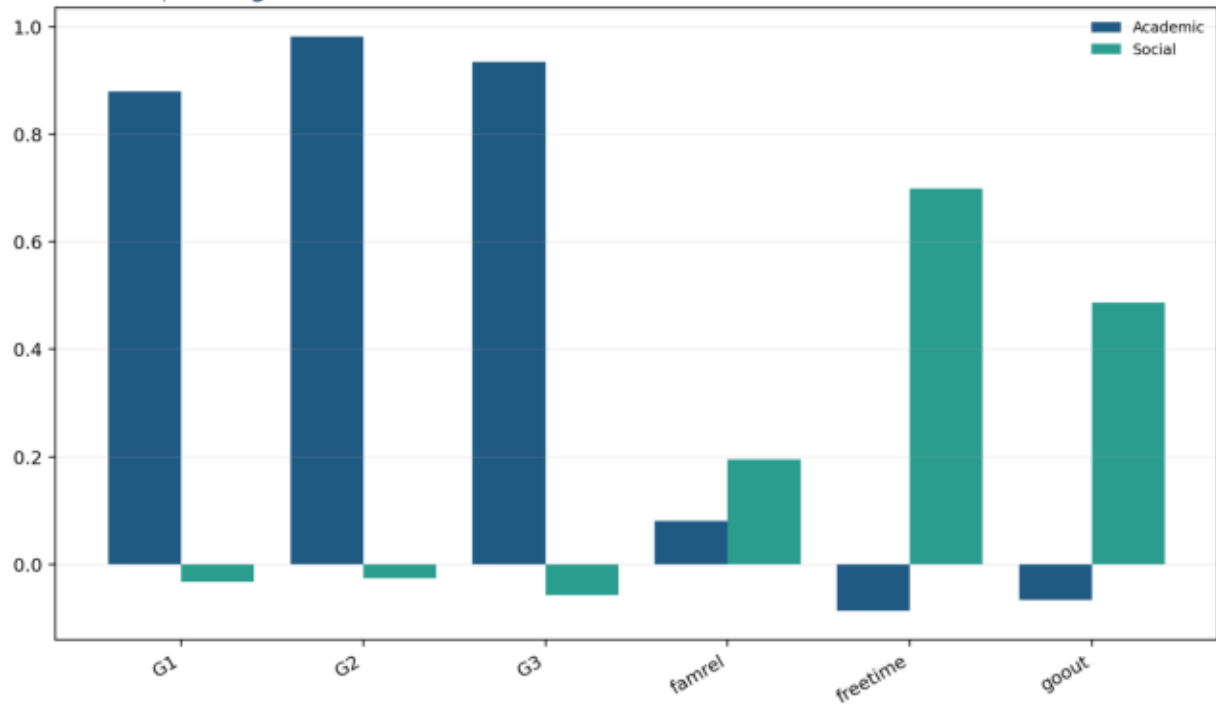
Promax Power Four Pattern



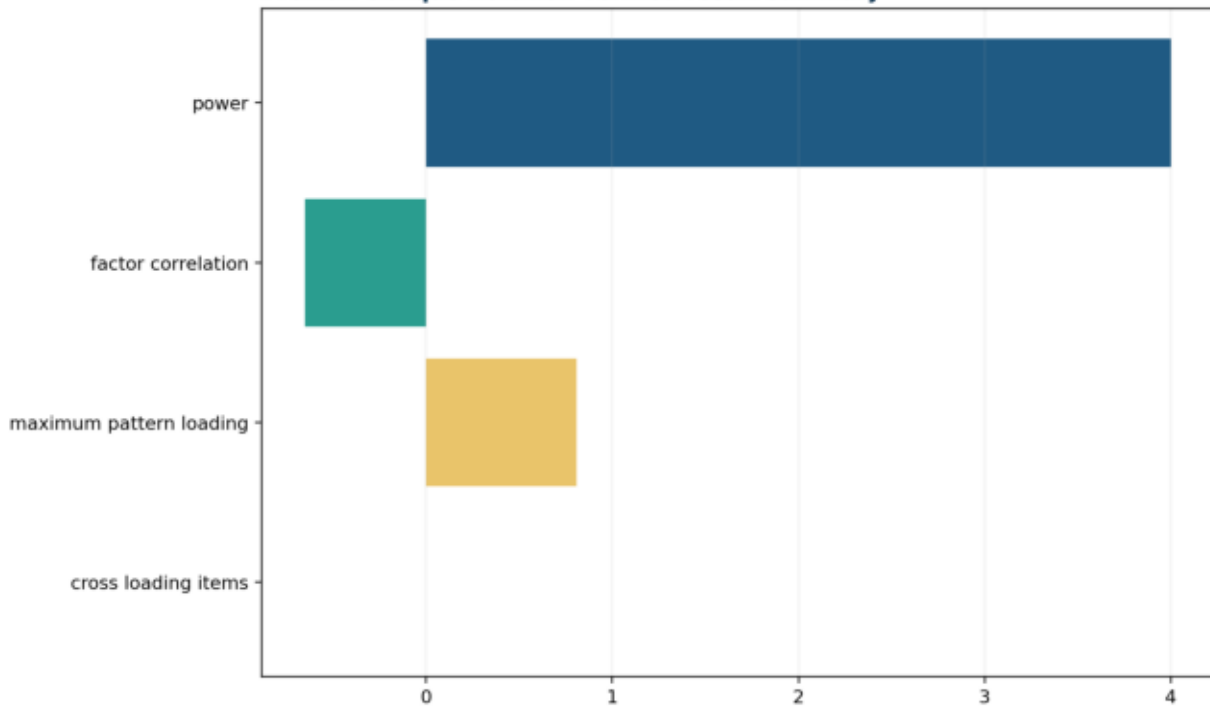
Promax Factor Correlation



Varimax Starting Solution



Promax Oblique Rotation verified result summary



Primary Metrics

metric	value
power	4
factor_correlation	-0.652546
maximum_pattern_loading	0.808825
cross_loading_items	0

Promax Power Four Pattern

item	Academic	Social
G1	0.723442	-0.000649935
G2	0.808825	0.00189534
G3	0.767037	-0.00656144
famrel	0.0832581	0.0505369
freetime	-0.0126077	0.177724
goout	-0.0133065	0.123754

Promax Factor Correlation

factor	Academic	Social
Academic	1.47944	-0.652546
Social	-0.652546	15.6149

Varimax Starting Solution

item	Academic	Social
G1	0.879691	-0.0325404
G2	0.982459	-0.0260739
G3	0.935067	-0.0575854
famrel	0.0808553	0.195209
freetime	-0.0869079	0.699155
goout	-0.0660198	0.487027