

Exploratory Principal-Axis Factor Analysis

Standalone verified Python analysis

Test: Exploratory Principal-Axis Factor Analysis

Design: Unconstrained two-factor principal-axis extraction followed by oblimin rotation.

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

Null hypothesis: Two common factors explain no reproducible covariance beyond uniqueness.

Formula: Iterate communalities, extract two reduced-correlation eigenvectors, then rotate obliquely.

Source rows: 649

Calculated metrics:

factors: 2

mean_communality: 0.5668425200713844

minimum_communality: 0.044644194156506216

iterations: 500

maximum_loading: 0.9849922123249903

Independent reference values:

factors: 2

mean_communality: 0.5668425200713844

minimum_communality: 0.044644194156506216

iterations: 500

maximum_loading: 0.9849922123249903

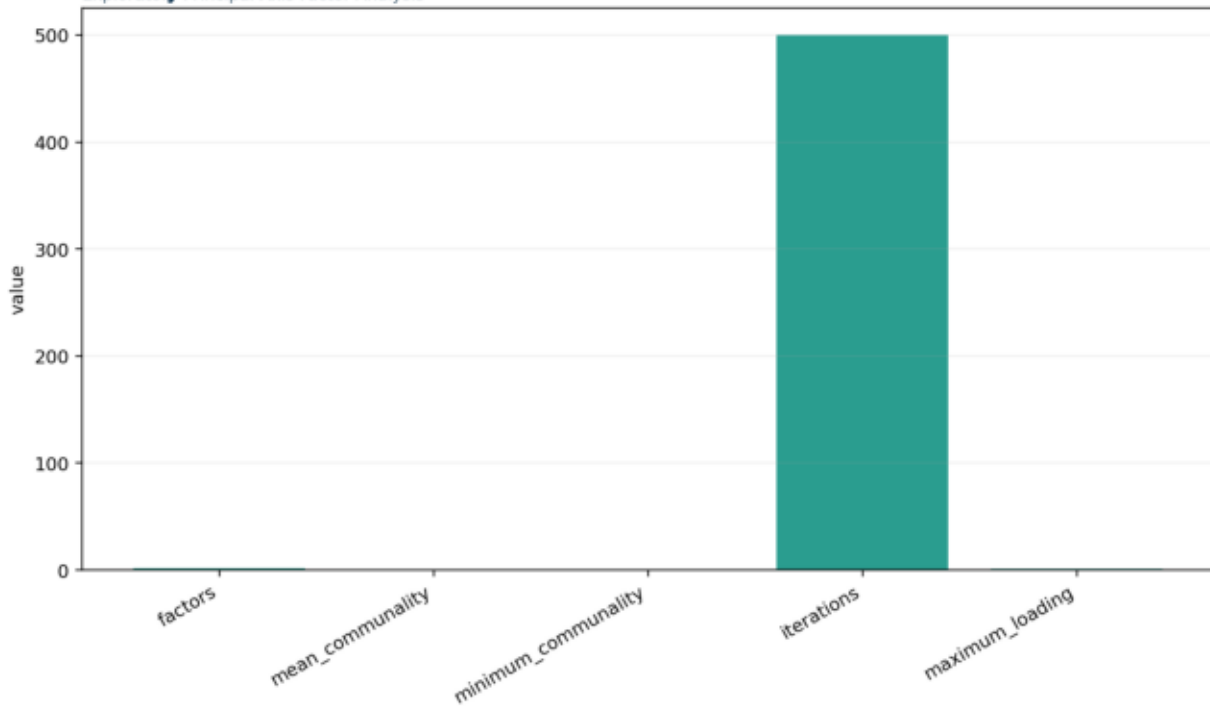
Interpretation:

EFA estimates two principal-axis factors and then rotates them obliquely.

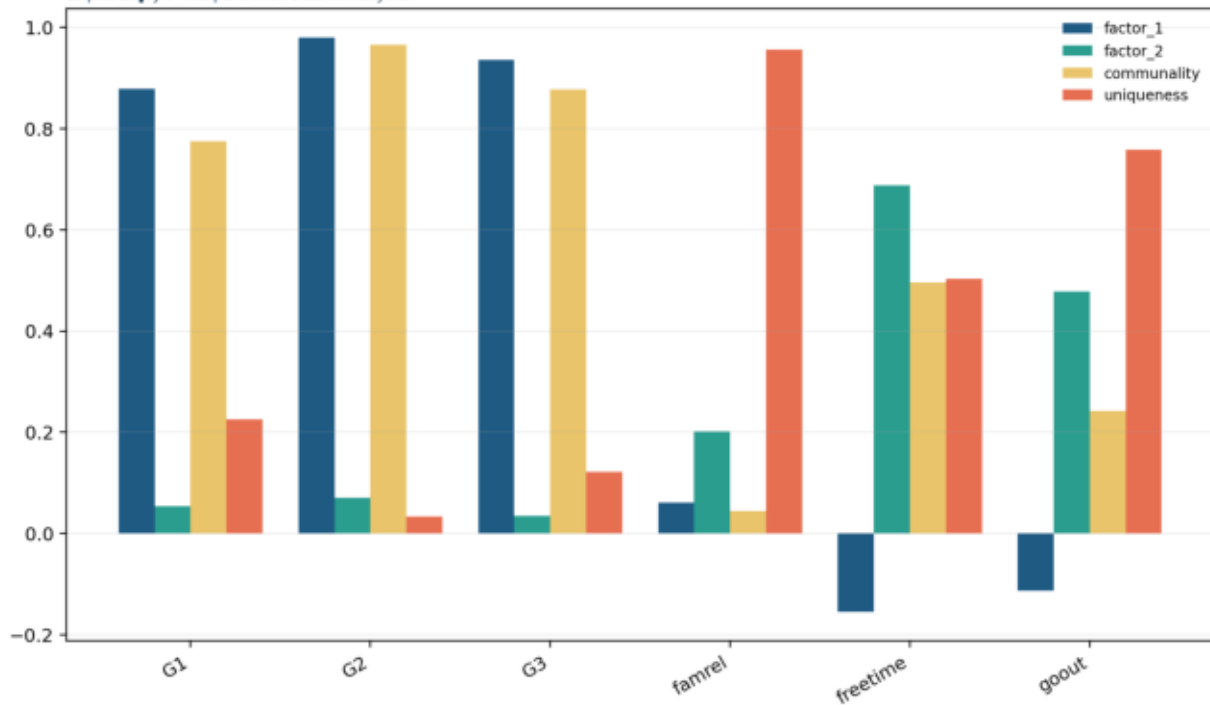
Maximum rotated loading=0.984992.

Primary Metrics

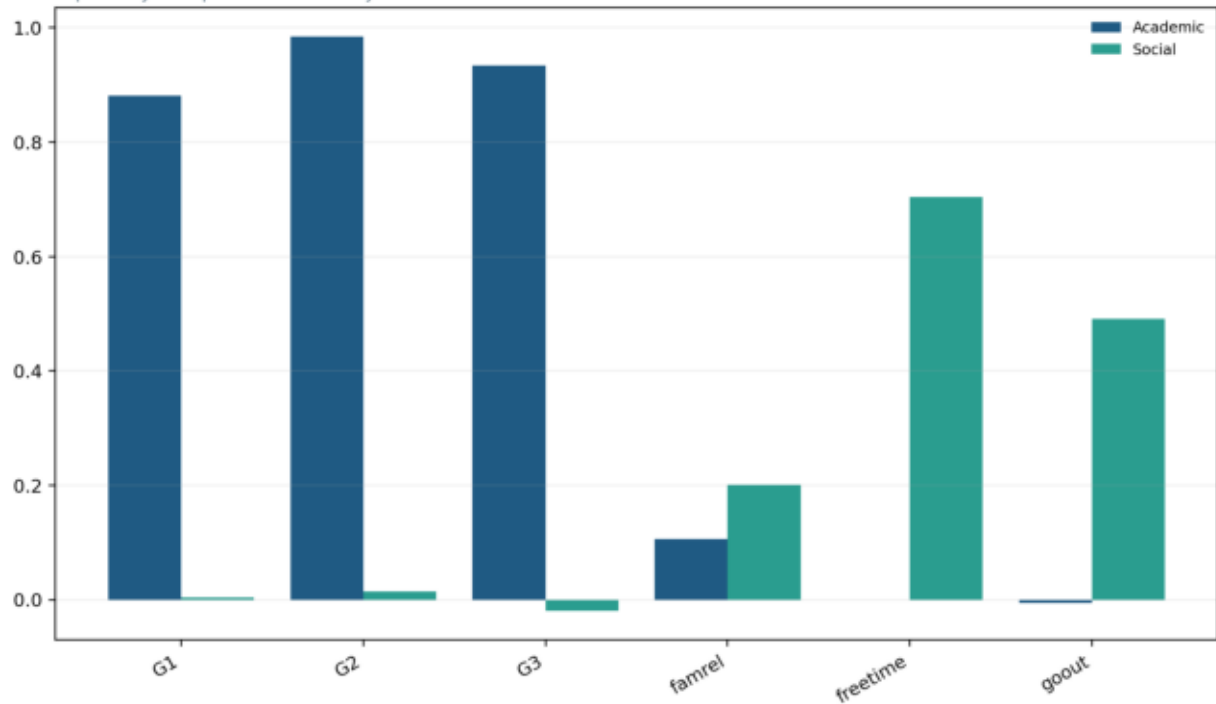
Exploratory Factor Analysis



Principal Axis Unrotated Analysis

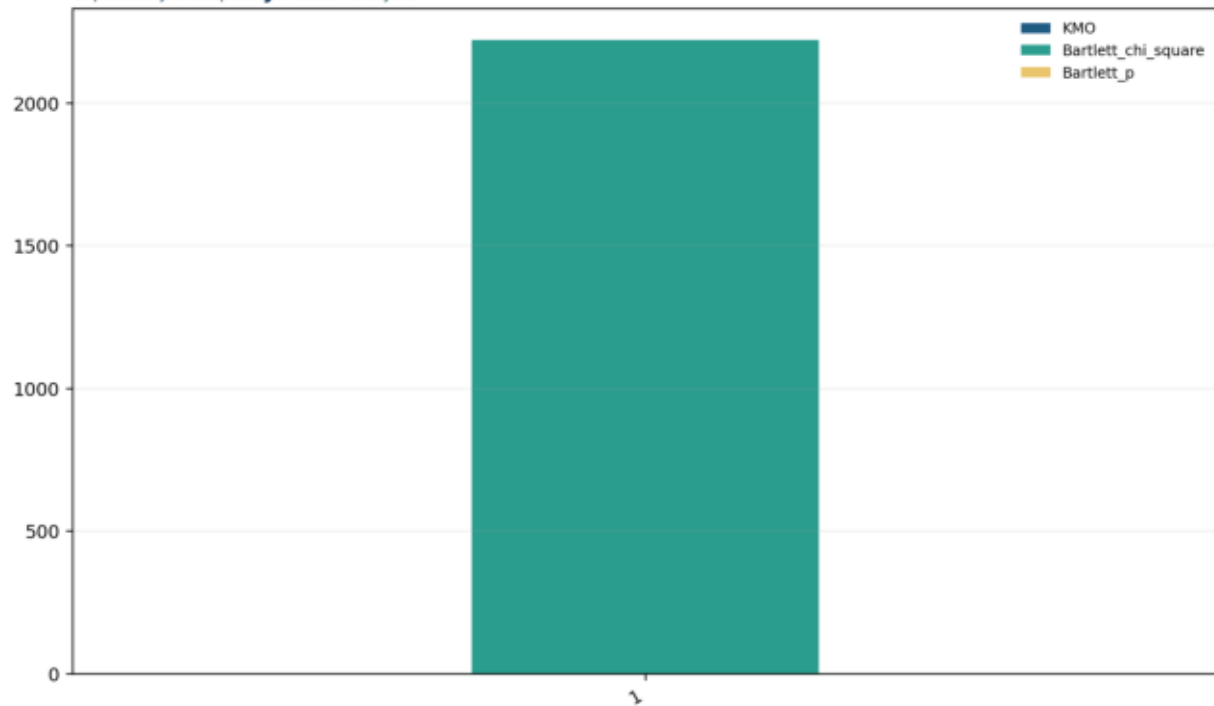


Oblimin Pattern
Principal Component Analysis

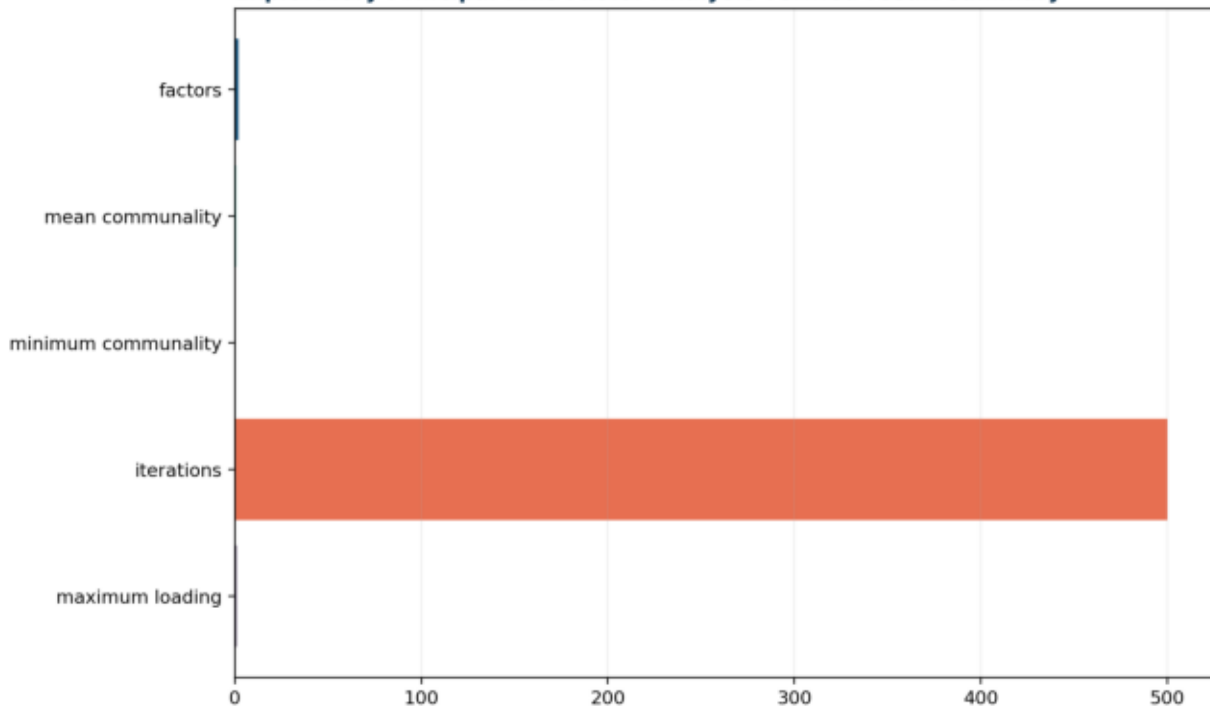


Efa Factorability

Factor Analysis



Exploratory Principal-Axis Factor Analysis verified result summary



Primary Metrics

metric	value
factors	2
mean_communality	0.566843
minimum_communality	0.0446442
iterations	500
maximum_loading	0.984992

Principal Axis Unrotated

item	factor_1	factor_2	communality	uniqueness
G1	0.878645	0.053824	0.774915	0.225085
G2	0.980285	0.0703304	0.965905	0.034095
G3	0.936209	0.0343263	0.877666	0.122334
famrel	0.061336	0.202193	0.0446442	0.955356
freetime	-0.155005	0.687273	0.496371	0.503629
goout	-0.11343	0.478213	0.241554	0.758446

Oblimin Pattern

item	Academic	Social
G1	0.880821	0.00328991
G2	0.984992	0.0140718
G3	0.933421	-0.0197898
famrel	0.105501	0.201004
freetime	-0.000844467	0.704398
goout	-0.00610066	0.490454

Efa Factorability

KMO	Bartlett_chi_square	Bartlett_p
0.731977	2220.63	0