

Correlation-Matrix Eigenvalues

Standalone verified Python analysis

Test: Correlation-Matrix Eigenvalues

Design: Ordered PCA eigenvalues and variance proportions of the six-item correlation matrix.

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

Null hypothesis: No component eigenvalue exceeds the unit-eigenvalue benchmark.

Formula: $R v_j = \lambda_j v_j$; $\text{proportion}_j = \lambda_j / p$.

Source rows: 649

Calculated metrics:

largest_eigenvalue: 2.7828698961540006

second_eigenvalue: 1.3848036796677767

eigenvalues_above_one: 2

first_two_variance: 0.694612262636963

variables: 6

Independent reference values:

largest_eigenvalue: 2.7828698961540006

second_eigenvalue: 1.3848036796677767

eigenvalues_above_one: 2

first_two_variance: 0.694612262636963

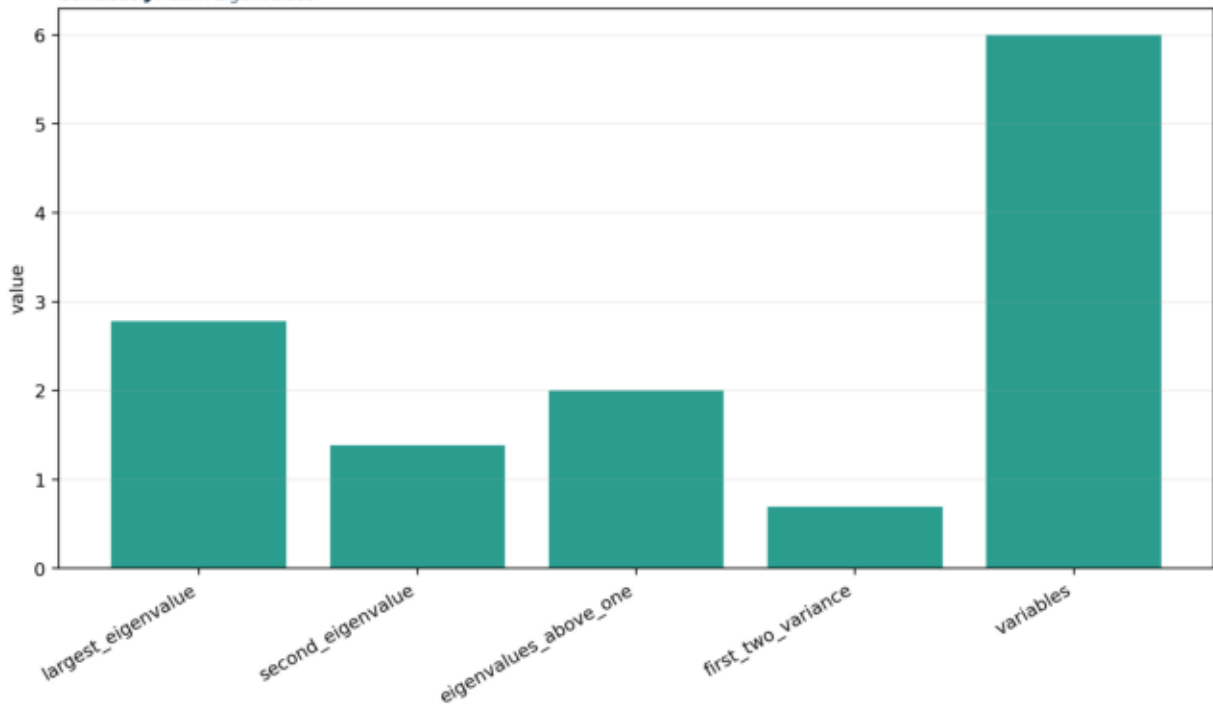
variables: 6

Interpretation:

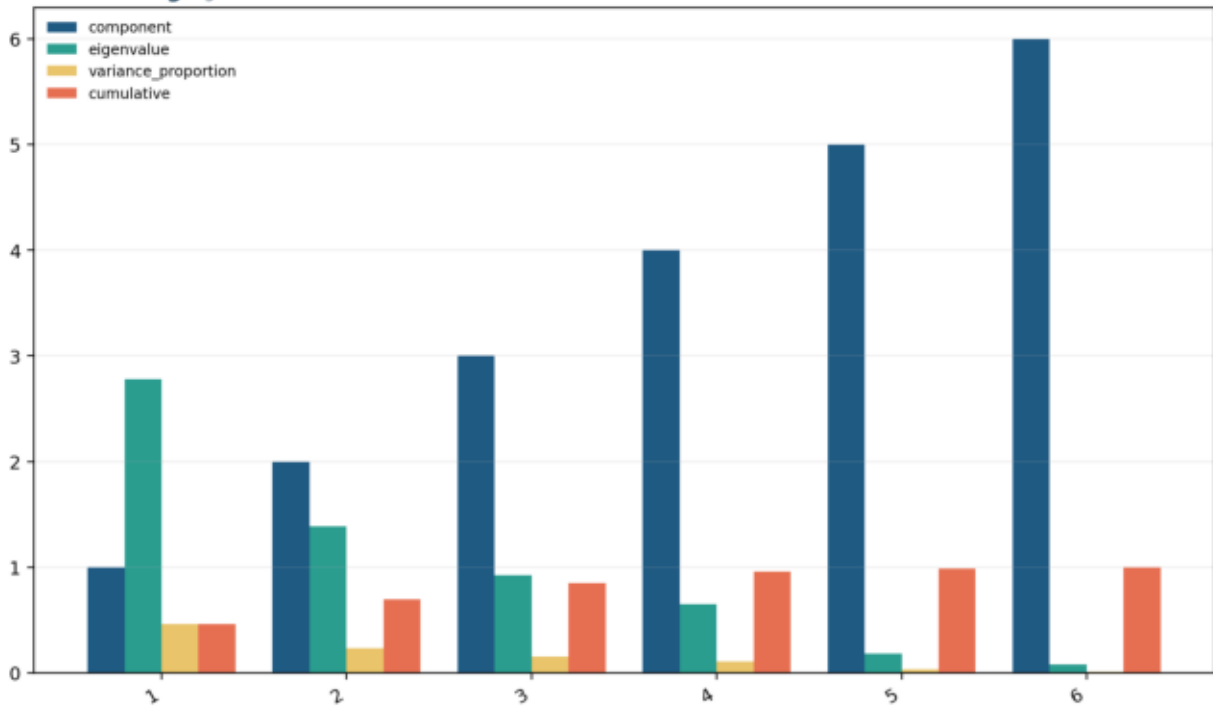
Correlation-matrix eigenvalues sum to the six standardized variables.

The first two account for 69.461226%.

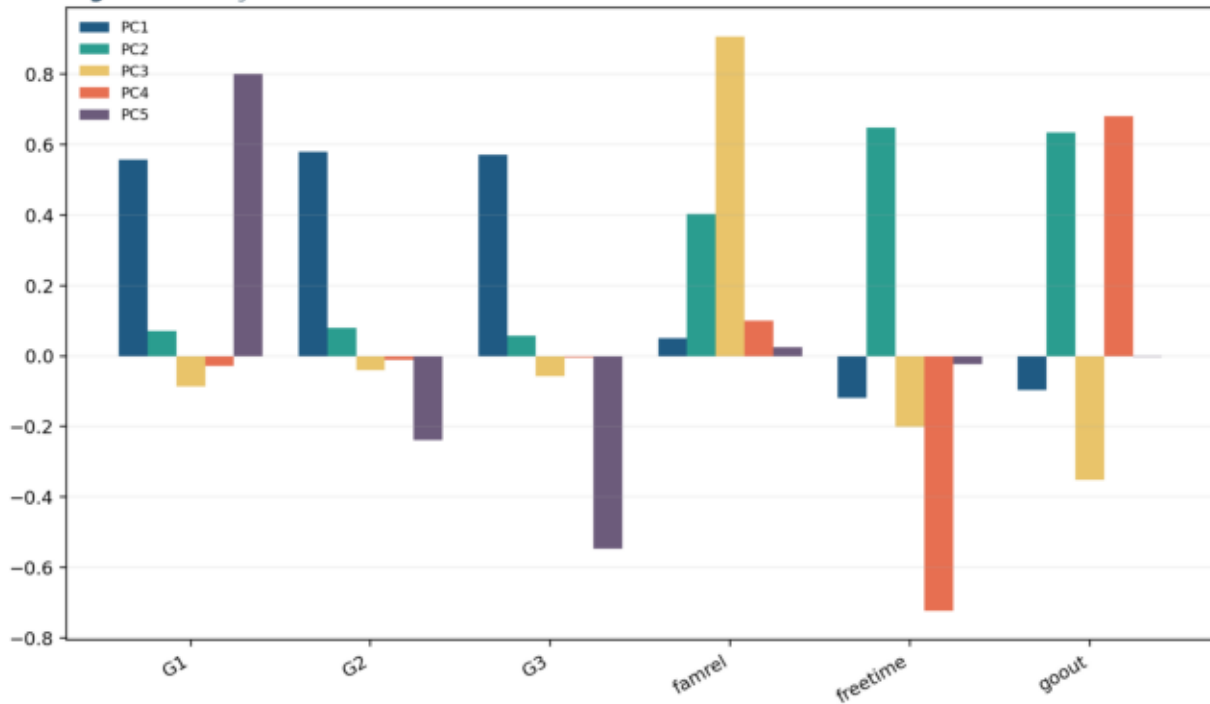
Primary Metrics



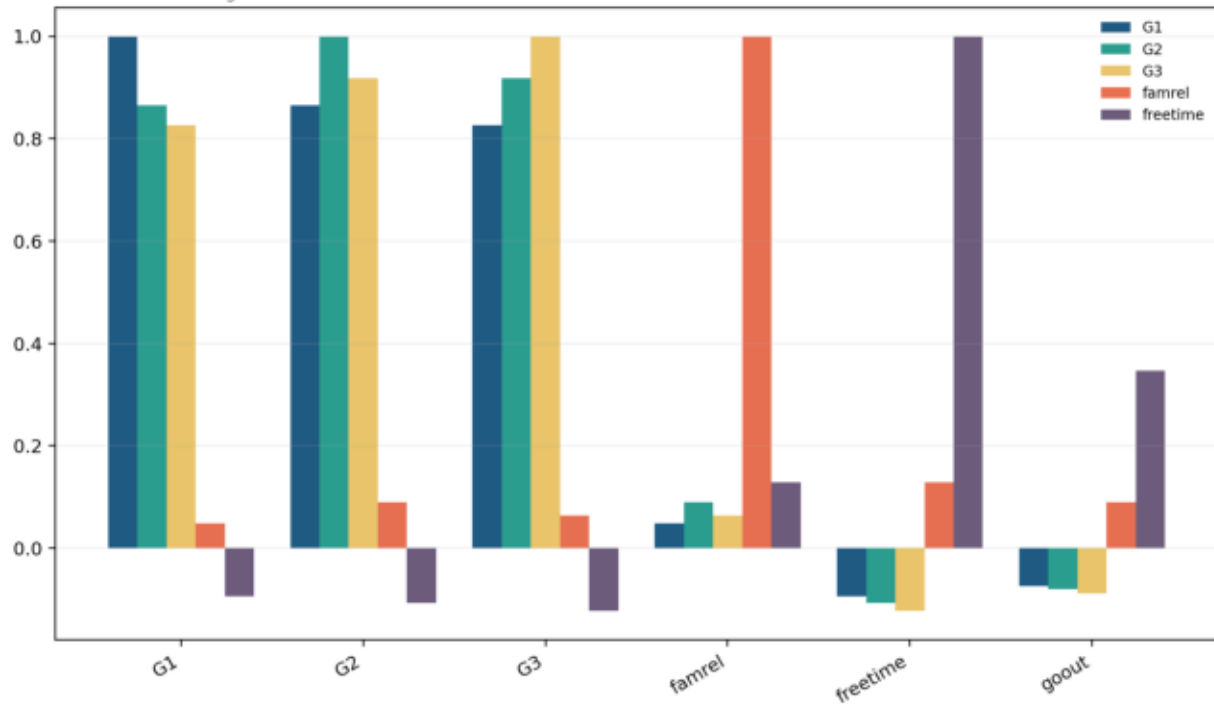
Ordered Eigenvalues



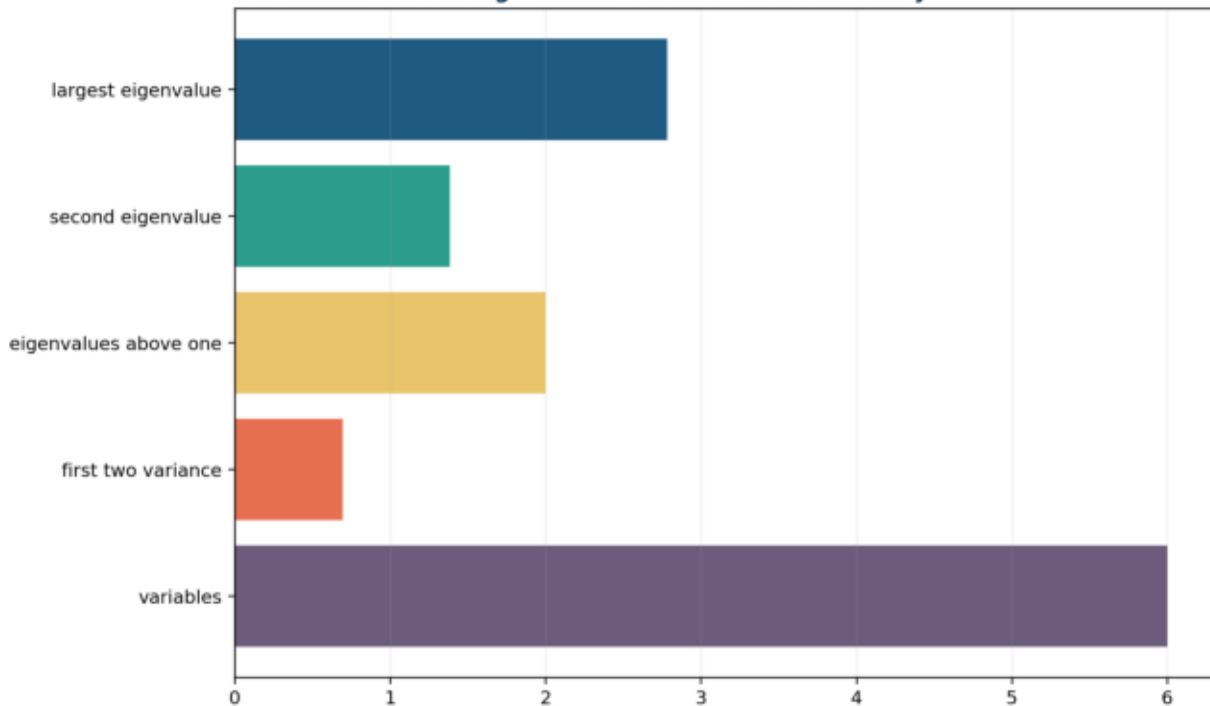
Eigenvectors Eigenvalues



Correlation Matrix



Correlation-Matrix Eigenvalues verified result summary



Primary Metrics

metric	value
largest_eigenvalue	2.78287
second_eigenvalue	1.3848
eigenvalues_above_one	2
first_two_variance	0.694612
variables	6

Ordered Eigenvalues

component	eigenvalue	variance_proportion	cumulative
1	2.78287	0.463812	0.463812
2	1.3848	0.230801	0.694612
3	0.924099	0.154016	0.848629
4	0.650103	0.108351	0.956979
5	0.182299	0.0303832	0.987362
6	0.0758252	0.0126375	1

Eigenvectors

item	PC1	PC2	PC3	PC4	PC5	PC6
G1	0.557845	0.0711155	-0.0862519	-0.0287212	0.801292	0.182806
G2	0.579282	0.0794076	-0.0405476	-0.0114494	-0.238468	-0.774264
G3	0.571816	0.0572462	-0.0576323	-0.00350829	-0.547617	0.605419
famrel	0.0511733	0.402637	0.907785	0.100266	0.0247136	0.0229461
freetime	-0.118837	0.648573	-0.20049	-0.724177	-0.0237669	0.00613466
goout	-0.0976112	0.634505	-0.351176	0.681576	-0.00194667	0.000955769

Correlation Matrix

item	G1	G2	G3	famrel	freetime	goout
G1	1	0.864982	0.826387	0.0487946	-0.0944966	-0.0740526
G2	0.864982	1	0.918548	0.0895878	-0.106678	-0.0794692
G3	0.826387	0.918548	1	0.0633611	-0.122705	-0.0876407
famrel	0.0487946	0.0895878	0.0633611	1	0.129216	0.0897066
freetime	-0.0944966	-0.106678	-0.122705	0.129216	1	0.346352
goout	-0.0740526	-0.0794692	-0.0876407	0.0897066	0.346352	1