

```
1177 0 OUTPUT ACTIVATE FactorLoadingsOutput.  
1177 0 M> OUTPUT ACTIVATE FactorLoadingsOutput.  
1178 0 TITLE 'Factor Loading Diagnostics'.  
1178 0 M> TITLE 'Factor Loading Diagnostics'.
```

Factor Loading Diagnostics

```
1179 0
1179 0 M>
1180 0 GET DATA
1180 0 M> GET DATA
1181 0 /TYPE=TXT /FILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Factor Loadings\dataset.csv' /ENCODING='UTF
      8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"'
1181 0 M> /TYPE=TXT /FILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Factor Loadings\dataset.csv' /ENCODING='
      UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"'
1182 0 /ARRANGEMENT=DELIMITED /FIRSTCASE=2
1182 0 M> /ARRANGEMENT=DELIMITED /FIRSTCASE=2
1183 0 /VARIABLES=
1183 0 M> /VARIABLES=
1184 0 school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0
      Fedu F8.0
1184 0 M> school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F
      8.0 Fedu F8.0
1185 0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime
      F8.0 failures F8.0
1185 0 M> Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studyti
      me F8.0 failures F8.0
1186 0 schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8 in
      ternet A8 romantic A8
1186 0 M> schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8
      internet A8 romantic A8
1187 0 famrel F8.0 freetime F8.0 goout F8.0 Dalc F8.0 Walc F8.0 health F8.0
      absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
1187 0 M> famrel F8.0 freetime F8.0 goout F8.0 Dalc F8.0 Walc F8.0 health F
      8.0 absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
1188 0 DATASET NAME FactorLoadingsData.
1188 0 M> DATASET NAME FactorLoadingsData.
1189 0 COMPUTE subject_id=$CASENUM.
1189 0 M> COMPUTE subject_id=$CASENUM.
1190 0 COMPUTE Dalc_R=6-Dalc.
1190 0 M> COMPUTE Dalc_R=6-Dalc.
1191 0 COMPUTE Walc_R=6-Walc.
1191 0 M> COMPUTE Walc_R=6-Walc.
```

Factor Loading Diagnostics

```
1192  0  RECODE schoolsup famsup paid activities higher internet ('no'=0) ('yes'=1)
1192  0 M> RECODE schoolsup famsup paid activities higher internet ('no'=0) ('yes'=1)
1193  0  INTO schoolsup_b famsup_b paid_b activities_b higher_b internet_b.
1193  0 M> INTO schoolsup_b famsup_b paid_b activities_b higher_b internet_b
.
1194  0  EXECUTE.
1194  0 M> EXECUTE.
1195  0
1195  0 M>
1196  0  * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1196  0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1197  0  TITLE 'Factor Loading Diagnostics'.
1197  0 M> TITLE 'Factor Loading Diagnostics'.
```

Factor Loading Diagnostics

```
1198 0 SUBTITLE 'Primary loading and cross-loading inspection'.  
1198 0 M> SUBTITLE 'Primary loading and cross-loading inspection'.
```

Factor Loading Diagnostics

Primary loading and cross-loading inspection

```

1199  0  FACTOR /VARIABLES=G1 G2 G3 famrel freetime goout /MISSING=LISTWISE /A
NALYSIS=G1 G2 G3 famrel freetime goout
1199  0 M>  FACTOR /VARIABLES=G1 G2 G3 famrel freetime goout /MISSING=LISTWISE
 /ANALYSIS=G1 G2 G3 famrel freetime goout
1200  0  /PRINT=INITIAL EXTRACTION KMO CORRELATION ROTATION /PLOT=EIGEN ROTAT
ION
1200  0 M>  /PRINT=INITIAL EXTRACTION KMO CORRELATION ROTATION /PLOT=EIGEN RO
TATION
1201  0  /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=OBLIMIN
/METHOD=CORRELATION.
1201  0 M>  /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=OBLIM
IN /METHOD=CORRELATION.

```

Factor Analysis

Notes

Output Created		18-JUL-2026 10:56:00
Comments		
Input	Data	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Factor Loadings\dataset.csv
	Active Dataset	FactorLoadingsData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.

Factor Loading Diagnostics
Primary loading and cross-loading inspection

Notes

Syntax		FACTOR /VARIABLES=G1 G2 G3 famrel freetime goout /MISSING=LISTWISE /ANALYSIS=G1 G2 G3 famrel freetime goout /PRINT=INITIAL EXTRACTION KMO CORRELATION ROTATION /PLOT=EIGEN ROTATION /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=OBLIMIN /METHOD=CORRELATIO...
Resources	Processor Time	00:00:01.45
	Elapsed Time	00:00:00.80
	Maximum Memory Required	5704 (5.570K) bytes

[FactorLoadingsData]

Correlation Matrix

		G1	G2	G3	famrel	freetime	goout
Correlation	G1	1.000	.865	.826	.049	-.094	-.074
	G2	.865	1.000	.919	.090	-.107	-.079
	G3	.826	.919	1.000	.063	-.123	-.088
	famrel	.049	.090	.063	1.000	.129	.090
	freetime	-.094	-.107	-.123	.129	1.000	.346
	goout	-.074	-.079	-.088	.090	.346	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.732
Bartlett's Test of Sphericity	Approx. Chi-Square	2220.632
	df	15
	Sig.	.000

Factor Loading Diagnostics
Primary loading and cross-loading inspection

Communalities

	Initial	Extraction
G1	.755	.775
G2	.880	.966
G3	.849	.878
famrel	.034	.045
freetime	.140	.474
goout	.125	.252

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Factor	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.783	46.381	46.381	2.650	44.166	44.166
2	1.385	23.080	69.461	.740	12.337	56.503
3	.924	15.402	84.863			
4	.650	10.835	95.698			
5	.182	3.038	98.736			
6	.076	1.264	100.000			

Total Variance Explained

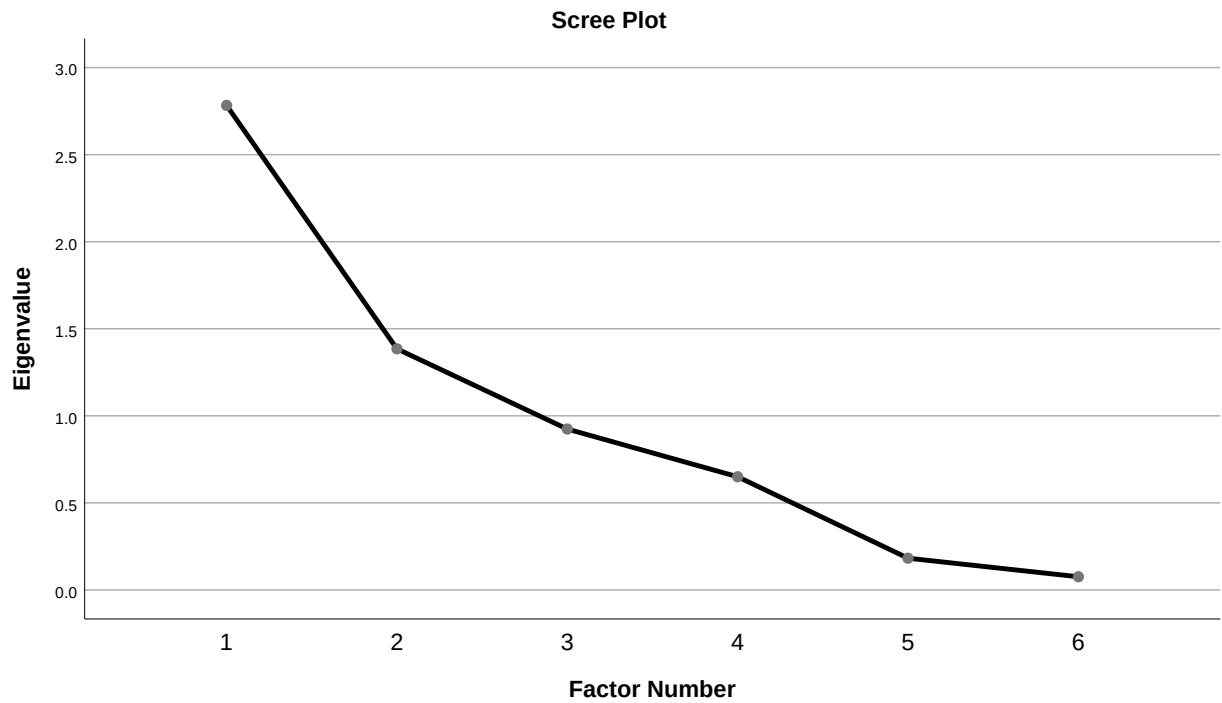
Factor	Rotation Sums of Squared Loadings ^a
	Total
1	2.641
2	.750
3	
4	
5	
6	

Factor Loading Diagnostics

Primary loading and cross-loading inspection

Extraction Method: Principal Axis Factoring.

- a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.



Factor Matrix^a

	Factor	
	1	2
G1	.879	.053
G2	.980	.070
G3	.936	.033
famrel	.061	.204
freetime	-.153	.671
goout	-.114	.489

Extraction Method: Principal Axis Factoring.

- a. 2 factors extracted. 41 iterations required.

Factor Loading Diagnostics
Primary loading and cross-loading inspection

Pattern Matrix^a

	Factor	
	1	2
G1	.880	-.007
G2	.983	.003
G3	.936	-.030
famrel	.076	.199
freetime	-.104	.680
goout	-.078	.495

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Structure Matrix

	Factor	
	1	2
G1	.880	-.012
G2	.983	-.002
G3	.936	-.035
famrel	.075	.199
freetime	-.108	.681
goout	-.080	.496

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

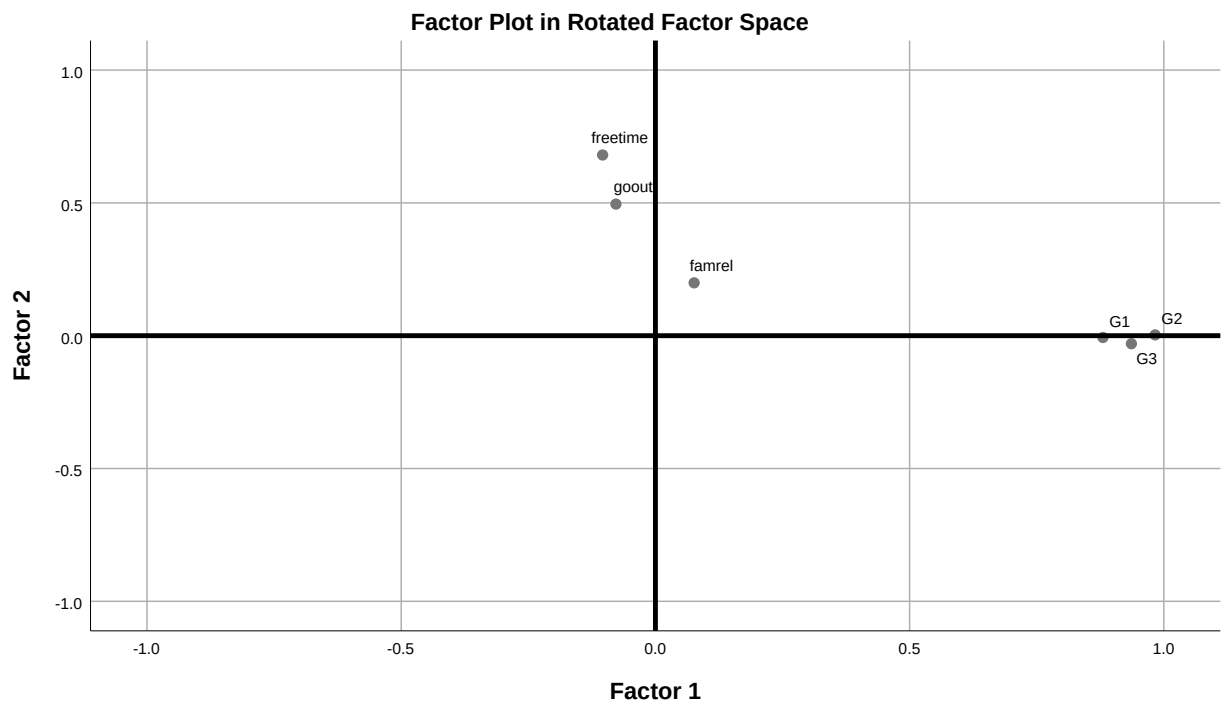
Factor Loading Diagnostics

Primary loading and cross-loading inspection

Factor Correlation Matrix

Factor	1	2
1	1.000	-.005
2	-.005	1.000

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.



```
1202  0  ECHO 'Salient loadings use the declared absolute 0.40 threshold'.
1202  0  M> ECHO 'Salient loadings use the declared absolute 0.40 threshold'.
Salient loadings use the declared absolute 0.40 threshold
1203  0  DESCRIPTIVES VARIABLES=G1 G2 G3 famrel freetime goout /STATISTICS=MEAN
STDDEV MIN MAX.
1203  0  M> DESCRIPTIVES VARIABLES=G1 G2 G3 famrel freetime goout /STATISTICS=
MEAN STDDEV MIN MAX.
```

Descriptives

Factor Loading Diagnostics
Primary loading and cross-loading inspection

Notes

Output Created		18-JUL-2026 10:56:00
Comments		
Input	Data	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Factor Loadings\dataset.csv
	Active Dataset	FactorLoadingsData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=G1 G2 G3 famrel freetime goout /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.06
	Elapsed Time	00:00:00.12

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G1	649	0	19	11.40	2.745
G2	649	0	19	11.57	2.914
G3	649	0	19	11.91	3.231
famrel	649	1	5	3.93	.956
freetime	649	1	5	3.18	1.051
goout	649	1	5	3.18	1.176
Valid N (listwise)	649				

1204 0 * END METHOD-SPECIFIC SPSS WORKFLOW.

1204 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.

Factor Loading Diagnostics
Primary loading and cross-loading inspection

```
1205  0
1205  0 M>
1206  0  SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Scale T
esting\Factor Loadings\SPSS_Output\sav\factor-loadings
        _spss_ready_data.sav' /COMPRESSED.
1206  0 M>  SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Scal
e Testing\Factor Loadings\SPSS_Output\sav\factor-loadi
        ngs_spss_ready_data.sav' /COMPRESSED.

1207  0
1207  0 M>
1208  0  ECHO '=====
====='.
1208  0 M>  ECHO '=====
====='.
=====
1209  0  ECHO 'FACTOR LOADING DIAGNOSTICS'.
1209  0 M>  ECHO 'FACTOR LOADING DIAGNOSTICS'.
FACTOR LOADING DIAGNOSTICS
1210  0  ECHO 'Design: Item-level magnitude, primary-factor assignment, and cr
oss-loading checks after oblimin EFA.'.
1210  0 M>  ECHO 'Design: Item-level magnitude, primary-factor assignment, and
        cross-loading checks after oblimin EFA.'.
Design: Item-level magnitude, primary-factor assignment, and cross-loading che
cks after oblimin EFA.
1211  0  ECHO 'Null hypothesis: No item has an absolute loading of at least .4
0.'.
1211  0 M>  ECHO 'Null hypothesis: No item has an absolute loading of at least
        .40.'.
Null hypothesis: No item has an absolute loading of at least .40.
1212  0  ECHO 'Formula: Primary loading=max_j|lambda_ij|; cross-loading count=
sum_j I(|lambda_ij|>=.40).'.
1212  0 M>  ECHO 'Formula: Primary loading=max_j|lambda_ij|; cross-loading cou
nt=sum_j I(|lambda_ij|>=.40).'.
Formula: Primary loading=max_j|lambda_ij|; cross-loading count=sum_j I(|lambda
_ij|>=.40).
1213  0  ECHO 'Variables: G1, G2, G3, famrel, freetime, goout'.
1213  0 M>  ECHO 'Variables: G1, G2, G3, famrel, freetime, goout'.
Variables: G1, G2, G3, famrel, freetime, goout
1214  0  ECHO 'Rows analyzed: 649'.
```

Factor Loading Diagnostics
Primary loading and cross-loading inspection

```
1214 0 M> ECHO 'Rows analyzed: 649'.
Rows analyzed: 649
1215 0 ECHO 'cross_loading_items = 0'.
1215 0 M> ECHO 'cross_loading_items = 0'.
cross_loading_items = 0
1216 0 ECHO 'items = 6'.
1216 0 M> ECHO 'items = 6'.
items = 6
1217 0 ECHO 'maximum_primary_loading = 0.9849922123249903'.
1217 0 M> ECHO 'maximum_primary_loading = 0.9849922123249903'.
maximum_primary_loading = 0.9849922123249903
1218 0 ECHO 'minimum_primary_loading = 0.2010037775737925'.
1218 0 M> ECHO 'minimum_primary_loading = 0.2010037775737925'.
minimum_primary_loading = 0.2010037775737925
1219 0 ECHO 'salient_loadings = 5'.
1219 0 M> ECHO 'salient_loadings = 5'.
salient_loadings = 5
1220 0 ECHO 'Cross-check status: pass'.
1220 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
1221 0 ECHO '=====
====='.
1221 0 M> ECHO '=====
====='.
=====
1222 0
1222 0 M>
1223 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis and
Scale Testing\Factor Loadings\SPSS_Output\spv\factor-l
oadings_spss_output.spv'.
1223 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis a
nd Scale Testing\Factor Loadings\SPSS_Output\spv\facto
r-loadings_spss_output.spv'.
1224 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING
1224 0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING
```