

```
1597 0 OUTPUT ACTIVATE ModelFitIndicesOutput.  
1597 0 M> OUTPUT ACTIVATE ModelFitIndicesOutput.  
1598 0 TITLE 'SEM Model Fit Index Panel'.  
1598 0 M> TITLE 'SEM Model Fit Index Panel'.
```

SEM Model Fit Index Panel

```

1599 0
1599 0 M>
1600 0 GET DATA
1600 0 M> GET DATA
1601 0 /TYPE=TXT /FILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Sca
le Testing\Model Fit Indices\dataset.csv' /ENCODING='U
TF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='''
1601 0 M> /TYPE=TXT /FILE='D:\DATA ANALYSIS\L Validity Factor Analysis and
Scale Testing\Model Fit Indices\dataset.csv' /ENCODING
='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='''
1602 0 /ARRANGEMENT=DELIMITED /FIRSTCASE=2
1602 0 M> /ARRANGEMENT=DELIMITED /FIRSTCASE=2
1603 0 /VARIABLES=
1603 0 M> /VARIABLES=
1604 0 school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0
Fedu F8.0
1604 0 M> school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F
8.0 Fedu F8.0
1605 0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime
F8.0 failures F8.0
1605 0 M> Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studyti
me F8.0 failures F8.0
1606 0 schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8 in
ternet A8 romantic A8
1606 0 M> schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8
internet A8 romantic A8
1607 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.
1607 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.
1608 0 DATASET NAME ModelFitIndicesData.
1608 0 M> DATASET NAME ModelFitIndicesData.
1609 0 COMPUTE subject_id=$CASENUM.
1609 0 M> COMPUTE subject_id=$CASENUM.
1610 0 COMPUTE Dalc_R=6-Dalc.
1610 0 M> COMPUTE Dalc_R=6-Dalc.
1611 0 COMPUTE Walc_R=6-Walc.
1611 0 M> COMPUTE Walc_R=6-Walc.

```

SEM Model Fit Index Panel

```
1612 0 RECODE schoolsup famsup paid activities higher internet ('no'=0) ('yes'=1)
1612 0 M> RECODE schoolsup famsup paid activities higher internet ('no'=0) ('yes'=1)
1613 0 INTO schoolsup_b famsup_b paid_b activities_b higher_b internet_b.
1613 0 M> INTO schoolsup_b famsup_b paid_b activities_b higher_b internet_b
.
1614 0 EXECUTE.
1614 0 M> EXECUTE.
1615 0
1615 0 M>
1616 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1616 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1617 0 TITLE 'SEM Model Fit Index Panel'.
1617 0 M> TITLE 'SEM Model Fit Index Panel'.
```

SEM Model Fit Index Panel

```
1618 0 SUBTITLE 'Exact incremental residual absolute and parsimony fit'.  
1618 0 M> SUBTITLE 'Exact incremental residual absolute and parsimony fit'.
```

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

```

1619  0  FACTOR /VARIABLES=G1 G2 G3 famrel freetime goout /MISSING=LISTWISE /A
NALYSIS=G1 G2 G3 famrel freetime goout
1619  0 M>  FACTOR /VARIABLES=G1 G2 G3 famrel freetime goout /MISSING=LISTWISE
 /ANALYSIS=G1 G2 G3 famrel freetime goout
1620  0  /PRINT=INITIAL EXTRACTION KMO CORRELATION /PLOT=EIGEN
1620  0 M>  /PRINT=INITIAL EXTRACTION KMO CORRELATION /PLOT=EIGEN
1621  0  /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=NOROTATE
 /METHOD=CORRELATION.
1621  0 M>  /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=NOROT
ATE /METHOD=CORRELATION.

```

Factor Analysis

Notes

Output Created		18-JUL-2026 10:56:50
Comments		
Input	Data	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Model Fit Indices\dataset.csv
	Active Dataset	ModelFitIndicesData
	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.

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

Notes

Syntax		FACTOR /VARIABLES=G1 G2 G3 famrel freetime goout /MISSING=LISTWISE /ANALYSIS=G1 G2 G3 famrel freetime goout /PRINT=INITIAL EXTRACTION KMO CORRELATION /PLOT=EIGEN /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=NOROTATE /METHOD=CORRELATIO N.
Resources	Processor Time	00:00:00.47
	Elapsed Time	00:00:00.89
	Maximum Memory Required	5704 (5.570K) bytes

[ModelFitIndicesData]

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

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

Communalities

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

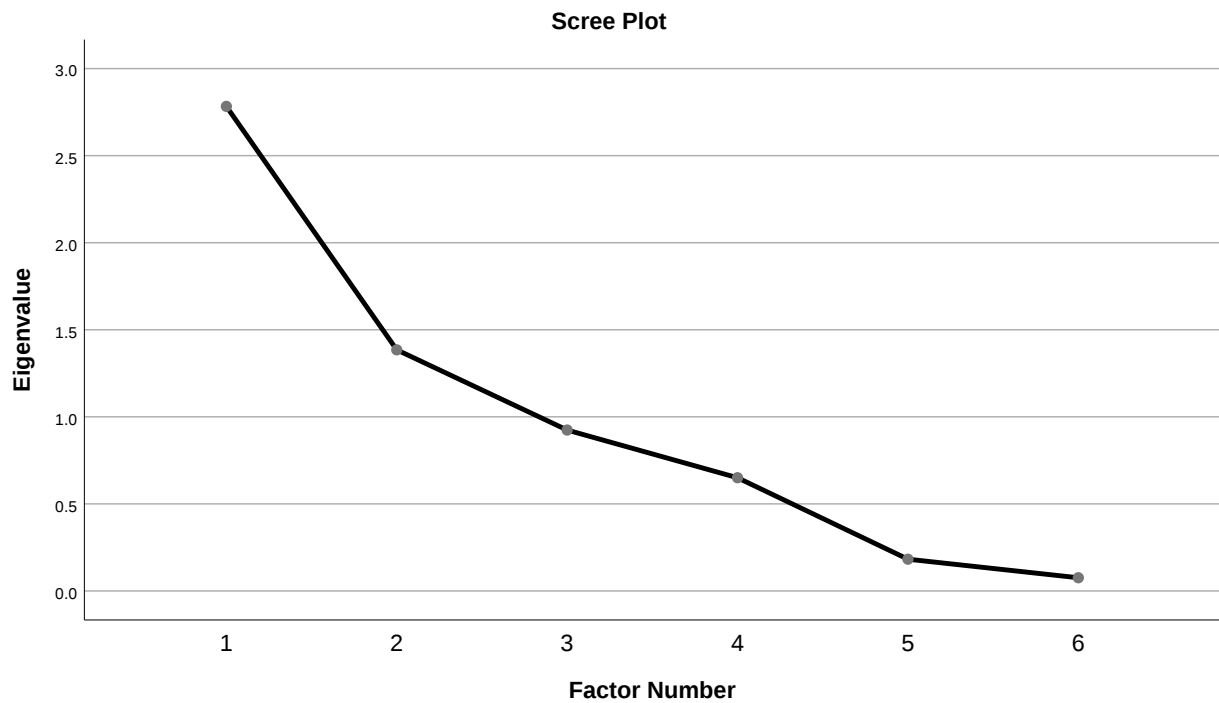
Extraction Method: Principal Axis Factoring.

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			

Extraction Method: Principal Axis Factoring.

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit



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.

```
1622 0 RELIABILITY /VARIABLES=G1 G2 G3 /SCALE('Academic measurement block')
ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SCALE CORR.
1622 0 M> RELIABILITY /VARIABLES=G1 G2 G3 /SCALE('Academic measurement block
') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SCALE CORR
```

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

Reliability

Notes

Output Created		18-JUL-2026 10:56:51
Comments		
Input	Data	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Model Fit Indices\dataset.csv
	Active Dataset	ModelFitIndicesData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
	Matrix Input	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Model Fit Indices\model_fit_indices_ spss_syntax.sps
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=G1 G2 G3 /SCALE('Academic measurement block') ALL /MODEL=ALPHA /STATISTICS=DESCRIPT IVE SCALE CORR.
Resources	Processor Time	00:00:00.09
	Elapsed Time	00:00:00.10

Scale: Academic measurement block

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

Case Processing Summary

		N	%
Cases	Valid	649	100.0
	Excluded ^a	0	.0
	Total	649	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.951	.953	3

Item Statistics

	Mean	Std. Deviation	N
G1	11.40	2.745	649
G2	11.57	2.914	649
G3	11.91	3.231	649

Inter-Item Correlation Matrix

	G1	G2	G3
G1	1.000	.865	.826
G2	.865	1.000	.919
G3	.826	.919	1.000

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
34.88	72.251	8.500	3

```
1623  0  RELIABILITY /VARIABLES=famrel freetime goout /SCALE('Social measureme
nt block') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SC
ALE CORR.
```

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

```
1623  0 M>  RELIABILITY /VARIABLES=famrel freetime goout /SCALE('Social measur
ement block') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE
SCALE CORR.
```

Reliability

Notes

Output Created		18-JUL-2026 10:56:51
Comments		
Input	Data	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Model Fit Indices\dataset.csv
	Active Dataset	ModelFitIndicesData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
	Matrix Input	D:\DATA ANALYSIS\L Validity Factor Analysis and Scale Testing\Model Fit Indices\model_fit_indices_ spss_syntax.sps
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=famrel freetime goout /SCALE ('Social measurement block') ALL /MODEL=ALPHA /STATISTICS=DESCRIPT IVE SCALE CORR.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.12

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

Scale: Social measurement block

Case Processing Summary

		N	%
Cases	Valid	649	100.0
	Excluded ^a	0	.0
	Total	649	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.419	.411	3

Item Statistics

	Mean	Std. Deviation	N
famrel	3.93	.956	649
freetime	3.18	1.051	649
goout	3.18	1.176	649

Inter-Item Correlation Matrix

	famrel	freetime	goout
famrel	1.000	.129	.090
freetime	.129	1.000	.346
goout	.090	.346	1.000

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
10.30	4.718	2.172	3

1624 0 ECHO 'No single index substitutes for the complete fit panel'.

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

```
1624 0 M> ECHO 'No single index substitutes for the complete fit panel'.
No single index substitutes for the complete fit panel
1625 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
1625 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
1626 0
1626 0 M>
1627 0 SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Scale T
esting\Model Fit Indices\SPSS_Output\sav\model-fit-ind
ices_spss_ready_data.sav' /COMPRESSED.
1627 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis and Scal
e Testing\Model Fit Indices\SPSS_Output\sav\model-fit-
indices_spss_ready_data.sav' /COMPRESSED.
1628 0
1628 0 M>
1629 0 ECHO '=====
====='.
1629 0 M> ECHO '=====
====='.
=====
1630 0 ECHO 'SEM MODEL FIT INDEX PANEL'.
1630 0 M> ECHO 'SEM MODEL FIT INDEX PANEL'.
SEM MODEL FIT INDEX PANEL
1631 0 ECHO 'Design: Exact, incremental, residual, parsimony-adjusted, and i
nformation-criterion fit measures.'.
1631 0 M> ECHO 'Design: Exact, incremental, residual, parsimony-adjusted, an
d information-criterion fit measures.'.
Design: Exact, incremental, residual, parsimony-adjusted, and information-crit
erion fit measures.
1632 0 ECHO 'Null hypothesis: The covariance model has no acceptable fit by
any declared index family.'.
1632 0 M> ECHO 'Null hypothesis: The covariance model has no acceptable fit
by any declared index family.'.
Null hypothesis: The covariance model has no acceptable fit by any declared in
dex family.
1633 0 ECHO 'Formula: Panel includes chi-square, CFI/TLI/NFI, RMSEA/SRMR, GF
I/AGFI, AIC/BIC.'.
1633 0 M> ECHO 'Formula: Panel includes chi-square, CFI/TLI/NFI, RMSEA/SRMR,
GFI/AGFI, AIC/BIC.'.
```

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

Formula: Panel includes chi-square, CFI/TLI/NFI, RMSEA/SRMR, GFI/AGFI, AIC/BIC

```
.
1634 0 ECHO 'Variables: G1, G2, G3, famrel, freetime, goout'.
1634 0 M> ECHO 'Variables: G1, G2, G3, famrel, freetime, goout'.
Variables: G1, G2, G3, famrel, freetime, goout
1635 0 ECHO 'Rows analyzed: 649'.
1635 0 M> ECHO 'Rows analyzed: 649'.
Rows analyzed: 649
1636 0 ECHO 'cfi = 0.9973982062491278'.
1636 0 M> ECHO 'cfi = 0.9973982062491278'.
cfi = 0.9973982062491278
1637 0 ECHO 'chi_square = 13.76397207713822'.
1637 0 M> ECHO 'chi_square = 13.76397207713822'.
chi_square = 13.76397207713822
1638 0 ECHO 'df = 8'.
1638 0 M> ECHO 'df = 8'.
df = 8
1639 0 ECHO 'gfi = 0.9926350185704358'.
1639 0 M> ECHO 'gfi = 0.9926350185704358'.
gfi = 0.9926350185704358
1640 0 ECHO 'rmsea = 0.03334482463134081'.
1640 0 M> ECHO 'rmsea = 0.03334482463134081'.
rmsea = 0.03334482463134081
1641 0 ECHO 'srmr = 0.03566318315739957'.
1641 0 M> ECHO 'srmr = 0.03566318315739957'.
srmr = 0.03566318315739957
1642 0 ECHO 'tli = 0.9951216367171145'.
1642 0 M> ECHO 'tli = 0.9951216367171145'.
tli = 0.9951216367171145
1643 0 ECHO 'Cross-check status: pass'.
1643 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
1644 0 ECHO '=====
====='.
1644 0 M> ECHO '=====
====='.
=====
1645 0
1645 0 M>
```

SEM Model Fit Index Panel
Exact incremental residual absolute and parsimony fit

```
1646 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis and
Scale Testing\Model Fit Indices\SPSS_Output\spv\model-
fit-indices_spss_output.spv'.
1646 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\L Validity Factor Analysis a
nd Scale Testing\Model Fit Indices\SPSS_Output\spv\mod
el-fit-indices_spss_output.spv'.
1647 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING
1647 0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING
```