

```
361 0 OUTPUT ACTIVATE FactorAnalysisforQuestionnaireDataOutput.  
361 0 M> OUTPUT ACTIVATE FactorAnalysisforQuestionnaireDataOutput.  
362 0 TITLE 'Factor Analysis for Questionnaire Data'.  
362 0 M> TITLE 'Factor Analysis for Questionnaire Data'.
```

Factor Analysis for Questionnaire Data

```
363 0
363 0 M>
364 0 GET DATA
364 0 M> GET DATA
365 0 /TYPE=TXT /FILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis
\Factor Analysis for Questionnaire Data\dataset.csv' /
    ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"'
365 0 M> /TYPE=TXT /FILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analy
sis\Factor Analysis for Questionnaire Data\dataset.csv
    ' /ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"'
366 0 /ARRANGEMENT=DELIMITED /FIRSTCASE=2
366 0 M> /ARRANGEMENT=DELIMITED /FIRSTCASE=2
367 0 /VARIABLES=
367 0 M> /VARIABLES=
368 0 school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0
Fedu F8.0
368 0 M> school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F
8.0 Fedu F8.0
369 0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime
F8.0 failures F8.0
369 0 M> Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studyti
me F8.0 failures F8.0
370 0 schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8 in
ternet A8 romantic A8
370 0 M> schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8
internet A8 romantic A8
371 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.
371 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.
372 0 DATASET NAME FactorAnalysisforQuestionnaireDataData.
372 0 M> DATASET NAME FactorAnalysisforQuestionnaireDataData.
373 0 COMPUTE subject_id=$CASENUM.
373 0 M> COMPUTE subject_id=$CASENUM.
374 0 COMPUTE Dalc_R=6-Dalc.
374 0 M> COMPUTE Dalc_R=6-Dalc.
375 0 COMPUTE Walc_R=6-Walc.
375 0 M> COMPUTE Walc_R=6-Walc.
```

Factor Analysis for Questionnaire Data

```
376 0 COMPUTE scale_score=MEAN.6(famrel,freetime,goout,Dalc_R,Walc_R,health).
376 0 M> COMPUTE scale_score=MEAN.6(famrel,freetime,goout,Dalc_R,Walc_R,health).
377 0 RECODE sex ('F'=1) ('M'=2) INTO sex_code.
377 0 M> RECODE sex ('F'=1) ('M'=2) INTO sex_code.
378 0 RECODE school ('GP'=1) ('MS'=2) INTO school_code.
378 0 M> RECODE school ('GP'=1) ('MS'=2) INTO school_code.
379 0 RECODE higher internet ('no'=0) ('yes'=1) INTO higher_code internet_code.
379 0 M> RECODE higher internet ('no'=0) ('yes'=1) INTO higher_code internet_code.
380 0 EXECUTE.
380 0 M> EXECUTE.
381 0
381 0 M>
382 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
382 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
383 0 TITLE 'Factor Analysis for Questionnaire Data'.
383 0 M> TITLE 'Factor Analysis for Questionnaire Data'.
```

Factor Analysis for Questionnaire Data

```
384 0 SUBTITLE 'Two-factor principal-axis analysis of rank-transformed ordered items'.
```

```
384 0 M> SUBTITLE 'Two-factor principal-axis analysis of rank-transformed ordered items'.
```

```
>Warning # 2004 on line 384. Command name: SUBTITLE
```

```
>The subtitle given exceeds 60 characters in length. The first 60 characters  
>will be used.
```

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

```
385  0  RANK VARIABLES=famrel freetime goout Dalc Walc health
385  0 M>  RANK VARIABLES=famrel freetime goout Dalc Walc health
386  0  /RANK INTO rank_famrel rank_freetime rank_goout rank_Dalc rank_Walc
rank_health /PRINT=NO.
386  0 M>  /RANK INTO rank_famrel rank_freetime rank_goout rank_Dalc rank_Wa
lc rank_health /PRINT=NO.
387  0  FACTOR /VARIABLES=rank_famrel rank_freetime rank_goout rank_Dalc rank
_walc rank_health
387  0 M>  FACTOR /VARIABLES=rank_famrel rank_freetime rank_goout rank_Dalc r
ank_walc rank_health
388  0  /MISSING=LISTWISE /ANALYSIS=rank_famrel rank_freetime rank_goout ran
k_Dalc rank_Walc rank_health
388  0 M>  /MISSING=LISTWISE /ANALYSIS=rank_famrel rank_freetime rank_goout
rank_Dalc rank_Walc rank_health
389  0  /PRINT=INITIAL EXTRACTION KMO CORRELATION ROTATION /PLOT=EIGEN ROTAT
ION
389  0 M>  /PRINT=INITIAL EXTRACTION KMO CORRELATION ROTATION /PLOT=EIGEN RO
TATION
390  0  /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=VARIMAX
/METHOD=CORRELATION.
390  0 M>  /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=VARIM
AX /METHOD=CORRELATION.
```

Factor Analysis

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

Notes

Output Created		18-JUL-2026 13:21:06
Comments		
Input	Data	D:\DATA ANALYSIS\ISM Survey and Likert Scale Analysis\Factor Analysis for Questionnaire Data\dataset.csv
	Active Dataset	FactorAnalysisforQuestionnaireDataData
	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.
Syntax		FACTOR /VARIABLES=rank_famrel rank_freetime rank_goout rank_Dalc rank_Walc rank_health /MISSING=LISTWISE /ANALYSIS=rank_famrel rank_freetime rank_goout rank_Dalc rank_Walc rank_health /PRINT=INITIAL EXTRACTION KMO CORRELATION ROTATION /PLOT=EIGEN ROTATION /CRITERIA=FACTORS(2) ITERATE(500) /EXTRACTION=PAF /ROTATION=VARIMAX /METHOD=CORRELATIO...

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

Notes

Resources	Processor Time	00:00:00.88
	Elapsed Time	00:00:00.72
	Maximum Memory Required	5704 (5.570K) bytes

Correlation Matrix

		Rank of famrel	Rank of freetime	Rank of goout	Rank of Dalc
Correlation	Rank of famrel	1.000	.144	.088	-.098
	Rank of freetime	.144	1.000	.354	.127
	Rank of goout	.088	.354	1.000	.234
	Rank of Dalc	-.098	.127	.234	1.000
	Rank of Walc	-.102	.120	.372	.613
	Rank of health	.093	.095	-.012	.085

Correlation Matrix

		Rank of Walc	Rank of health
Correlation	Rank of famrel	-.102	.093
	Rank of freetime	.120	.095
	Rank of goout	.372	-.012
	Rank of Dalc	.613	.085
	Rank of Walc	1.000	.114
	Rank of health	.114	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.569
Bartlett's Test of Sphericity	Approx. Chi-Square	546.102
	df	15
	Sig.	.000

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

Communalities

	Initial	Extraction
Rank of famrel	.056	.083
Rank of freetime	.151	.479
Rank of goout	.250	.326
Rank of Dalc	.381	.399
Rank of Walc	.444	.960
Rank of health	.039	.016

Extraction Method: Principal Axis Factoring.

Total Variance Explained

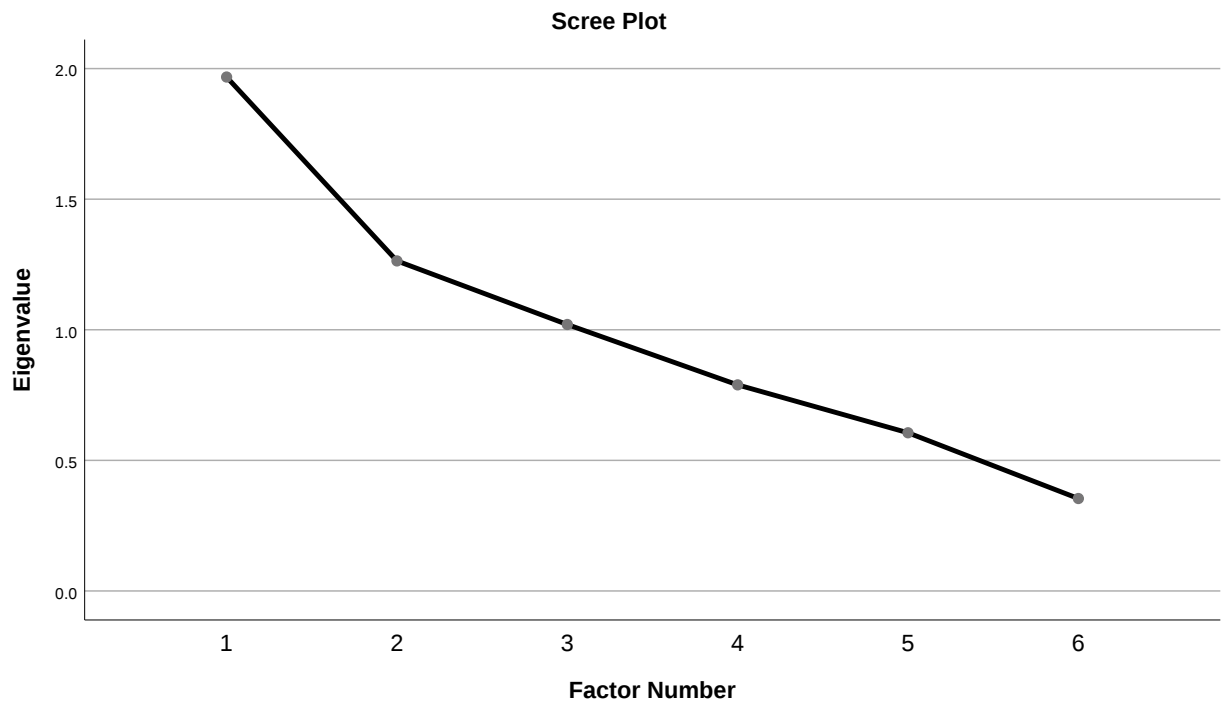
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.968	32.794	32.794	1.606	26.763	26.763
2	1.264	21.061	53.855	.657	10.946	37.709
3	1.020	17.003	70.858			
4	.789	13.150	84.008			
5	.606	10.094	94.102			
6	.354	5.898	100.000			

Total Variance Explained

Factor	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	1.541	25.677	25.677
2	.722	12.032	37.709
3			
4			
5			
6			

Extraction Method: Principal Axis Factoring.

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order



Factor Matrix^a

	Factor	
	1	2
Rank of famrel	-.038	.285
Rank of freetime	.323	.612
Rank of goout	.472	.321
Rank of Dalc	.615	-.144
Rank of Walc	.941	-.272
Rank of health	.114	.058

Extraction Method: Principal Axis
Factoring.

a. 2 factors extracted. 62 iterations required.

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

Rotated Factor Matrix^a

	Factor	
	1	2
Rank of famrel	-.111	.265
Rank of freetime	.151	.675
Rank of goout	.372	.433
Rank of Dalc	.631	.023
Rank of Walc	.980	-.016
Rank of health	.095	.086

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

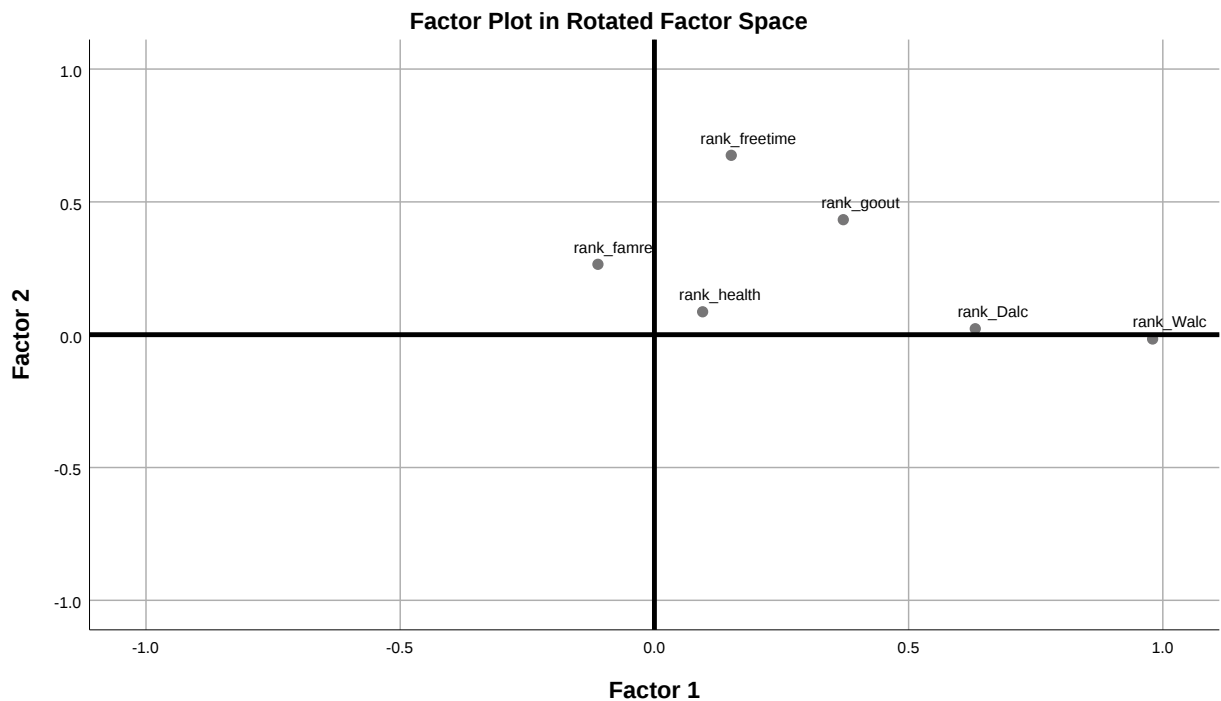
Factor Transformation Matrix

Factor	1	2
1	.965	.262
2	-.262	.965

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order



```
391 0 ECHO 'Rank transformation precedes principal-axis extraction so the native workflow respects ordered response information'.
```

```
391 0 M> ECHO 'Rank transformation precedes principal-axis extraction so the native workflow respects ordered response information'.
```

Rank transformation precedes principal-axis extraction so the native workflow respects ordered response information

```
392 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
```

```
392 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
```

```
393 0
```

```
393 0 M>
```

```
394 0 SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis\Factor Analysis for Questionnaire Data\SPSS_Output\sav\factor-analysis-for-questionnaire-data_spss_ready_data.sav' /COMPRESSED.
```

```
394 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis\Factor Analysis for Questionnaire Data\SPSS_Output\sav\factor-analysis-for-questionnaire-data_spss_ready_data.sav' /COMPRESSED.
```

```
395 0
```

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

```

395  0 M>
396  0 ECHO '=====
====='.
396  0 M> ECHO '=====
====='.
=====
397  0 ECHO 'FACTOR ANALYSIS FOR QUESTIONNAIRE DATA'.
397  0 M> ECHO 'FACTOR ANALYSIS FOR QUESTIONNAIRE DATA'.
FACTOR ANALYSIS FOR QUESTIONNAIRE DATA
398  0 ECHO 'Method type: factor_analysis'.
398  0 M> ECHO 'Method type: factor_analysis'.
Method type: factor_analysis
399  0 ECHO 'Design: Two-factor principal-axis analysis of six ordered quest
ionnaire items using Spearman correlations and varimax
rotation.'.
399  0 M> ECHO 'Design: Two-factor principal-axis analysis of six ordered qu
estionnaire items using Spearman correlations and vari
max rotation.'.
Design: Two-factor principal-axis analysis of six ordered questionnaire items
using Spearman correlations and varimax rotation.
400  0 ECHO 'Inference scope: Factor retention and loading interpretation ar
e the primary tasks; Bartlett's factorability test is
reported only as an applicable diagnostic.'.
400  0 M> ECHO 'Inference scope: Factor retention and loading interpretation
are the primary tasks; Bartlett's factorability test
is reported only as an applicable diagnostic.'.
Inference scope: Factor retention and loading interpretation are the primary t
asks; Bartlett's factorability test is reported only a
401  0 ECHO 'Formula: R_s=cor(ranks); h_i^2=sum(lambda_ij^2); varimax maxim
izes variance of squared loadings.'.
401  0 M> ECHO 'Formula: R_s=cor(ranks); h_i^2=sum(lambda_ij^2); varimax max
imizes variance of squared loadings.'.
Formula: R_s=cor(ranks); h_i^2=sum(lambda_ij^2); varimax maximizes variance of
squared loadings.
402  0 ECHO 'Variables: famrel, freetime, goout, Dalc, Walc, health'.
402  0 M> ECHO 'Variables: famrel, freetime, goout, Dalc, Walc, health'.
Variables: famrel, freetime, goout, Dalc, Walc, health
403  0 ECHO 'Rows analyzed: 649'.
403  0 M> ECHO 'Rows analyzed: 649'.

```

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

Rows analyzed: 649

```
404 0 ECHO 'bartlett_chi_square = 546.1019150641591'.
404 0 M> ECHO 'bartlett_chi_square = 546.1019150641591'.
bartlett_chi_square = 546.1019150641591
405 0 ECHO 'bartlett_df = 15'.
405 0 M> ECHO 'bartlett_df = 15'.
bartlett_df = 15
406 0 ECHO 'bartlett_p_value = 9.757783019303014e-107'.
406 0 M> ECHO 'bartlett_p_value = 9.757783019303014e-107'.
bartlett_p_value = 9.757783019303014e-107
407 0 ECHO 'factors = 2'.
407 0 M> ECHO 'factors = 2'.
factors = 2
408 0 ECHO 'iterations = 500'.
408 0 M> ECHO 'iterations = 500'.
iterations = 500
409 0 ECHO 'mean_communality = 0.38067120225972556'.
409 0 M> ECHO 'mean_communality = 0.38067120225972556'.
mean_communality = 0.38067120225972556
410 0 ECHO 'overall_kmo = 0.5687859036563742'.
410 0 M> ECHO 'overall_kmo = 0.5687859036563742'.
overall_kmo = 0.5687859036563742
411 0 ECHO 'Cross-check status: pass'.
411 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
412 0 ECHO '=====
====='.
412 0 M> ECHO '=====
====='.
=====
413 0
413 0 M>
414 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analy
sis\Factor Analysis for Questionnaire Data\SPSS_Output
\spv\factor-analysis-for-questionnaire-data_spss_output.spv'.
414 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale An
alysis\Factor Analysis for Questionnaire Data\SPSS_Out
put\spv\factor-analysis-for-questionnaire-data_spss_output.spv'
.
```

Factor Analysis for Questionnaire Data
Two-factor principal-axis analysis of rank-transformed order

```
415  0  OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI  
NTSETTING
```

```
415  0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=  
PRINTSETTING
```