Manual Of The Program

FACTOR

v.9.20

Windows XP/Vista/W7/W8

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Description

Factor is a program developed to fit the Exploratory Factor Analysis model. Below we describe the methods used.

Univariate and multivariate descriptives of variables:
- Univariate mean, variance, skewness, and kurtosis
- Multivariate skewness and kurtosis (Mardia, 1970)
- Var charts for ordinal variables

Dispersion matrices:
- User defined typo matrix
- Covariance matrix
- Pearson correlation matrix
- Polychoric correlation matrix (Polychoric algorithm: Olsson, 1979a, 1979b; Tetrachoric algorithm: Bonett & Price, 2005) with smoothing algorithm (Devlin, Gnanadesikan, & Kettenring, 1975; Devlin, Gnanadesikan, & Kettenring, 1981)

Procedures for determining the number of factors/components to be retained:
- MAP: Minimum Average Partial Test (Velicer, 1976)
- PA: Parallel Analysis (Horn, 1965)
- Optimal PA. It is an implementation of Parallel Analysis where it is computed based on the same type of correlation matrix (i.e., Pearson or polychoric correlation) and the same type of underlying dimensions (i.e., components of factor) as defined for the whole analysis (Timmerman & Lorenzo-Seva, 2011)
- Hull method for selecting the number of common factors: this method aims to find a model with an optimal balance between model fit and number of parameters (Lorenzo-Seva & Timmerman, 2011)

Factor and component analysis:
- PCA: Principal Component Analysis
- ULS: Unweighted Least Squares factor analysis (also MINRES and PAF)
- EML: Exploratory Maximum Likelihood factor analysis
- MRFA: Minimum Rank Factor Analysis (ten Berge, & Kiers, 1991)
- Schmid-Leiman second-order solution (1957)
- Factor scores (ten Berge, Krijnen, Wansbeek, & Shapiro, 1999)
- Person fit indices (Ferrando, 2009)

In ULS factor analysis, the Heywood case correction described in Mulaik (1972, page 153) is included: when an update has sum of squares larger than the observed variance of the variable, that row is updated by constrained regression using the procedure proposed by ten Berge and Nevels (1977).

Some of the rotation methods to obtain simplicity are:
- Quartimax (Neuhaus & Wrigley, 1954)
- Varimax (Kaiser, 1958)
- Weighted Varimax (Cureton & Mulaik, 1975)
- Orthomin (Bentler, 1977)

- Direct Oblimin (Clarkson & Jennrich, 1988)
- Weighted Oblimin (Lorenzo-Seva, 2000)
- Promax (Hendrickson & White, 1964)
- Promaj (Trendafilov, 1994)
- Promin (Lorenzo-Seva, 1999)
- Simplimax (Kiers, 1994)

Some of the indices used in the analysis are:

- Test on the dispersion matrix: Determinant, Bartlett's test and Kaiser-Meyer-Olkin (KMO)
- Goodness of fit statistics:
    - Chi-Square Non-Normed Fit Index (NNFI; Tucker & Lewis);
    - Comparative Fit Index (CFI);
    - Goodness of Fit Index (GFI);
    - Adjusted Goodness of Fit Index (AGFI);
    - Root Mean Square Error of Approximation (RMSEA);
    - Estimated Non-Centrality Parameter (NCP)
- Reliabilities of rotated components (ten Berge & Hofstee, 1999)
- Simplicity indices: Bentler's Simplicity index (1977) and Loading Simplicity index (Lorenzo-Seva, 2003)
- Mean, variance and histogram of fitted and standardised residuals. Automatic detection of large standardised residuals
- The greatest lower bound (glb) to reliability (Woodhouse & Jackson, 1977). The greatest lower bound (glb) to reliability represents the smallest reliability possible given observed covariance matrix under the restriction that the sum of error variances is maximized for errors that correlate 0 with other variables (Ten Berge, Snijders, & Zegers, 1981)
- McDonald's Omega. Omega can be interpreted as the square of the correlation between the scale score and the latent common to all the indicators in the infinite universe of indicators of which the scale indicators are a subset (McDonald, 1999, page 89).

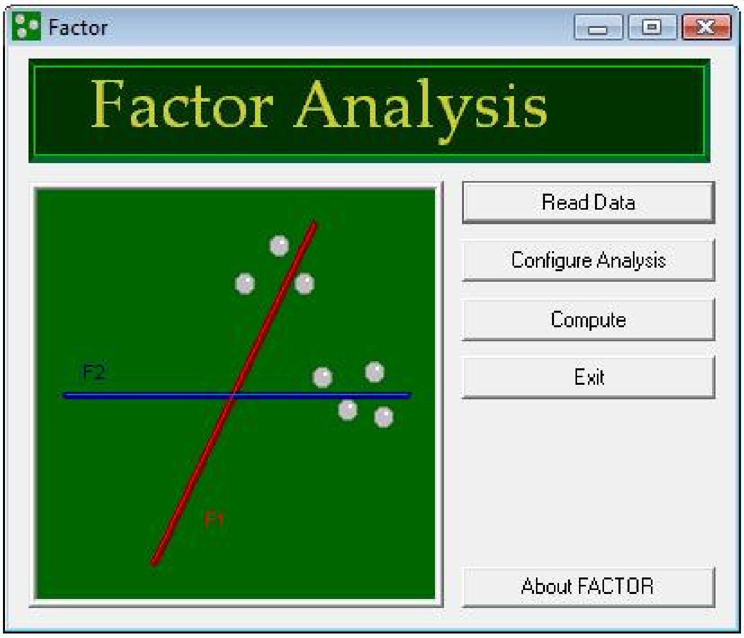
General information

We have developed Factor to be run in Microsoft Windows operating systems. We have tested the program in several computers with different chips (always pentiums) and Windows versions (95/98/NT/2000/XP/Vista/W7/W8), and found that worked suitably.

The number of variables and subjects in the data set is not limited. However, when analysing large data sets, the amount of memory installed in the computer is important for the speed of the analysis.

Main menu

We now describe the main window of Factor. From here data is read from the disk, the analysis is configured and the computing begins. The program continuously informs the user about the process and announces the job is finished.



The steps for analysing the data are:

- The data is read by clicking on Read Data button. (See details)
- The analysis is configured by clicking on Configure Analysis button. (See details)
- Finally, the analysis is started by clicking on Compute button. (See details)

The above order must be followed. The program will not allow the analysis to start before the data are read and the analysis is configured. After the computation, the output of the program is stored in the file *output.txt* (see the output section of this manual for details).

The Exit button ends the program.

Read data

When using Factor to analyze data, you will need the participants' scores to some observed variables. For example, you may have the scores of 1,500 participants for a test of 10 items.

The data must be stored in a file in ASCII format. The scores of each participant correspond to the rows in the file, while participants' answers to each item correspond to the columns in the file.

Each column has to be spaced by at least one character: a space character, a tab, a comma, a : character, or a ; character.

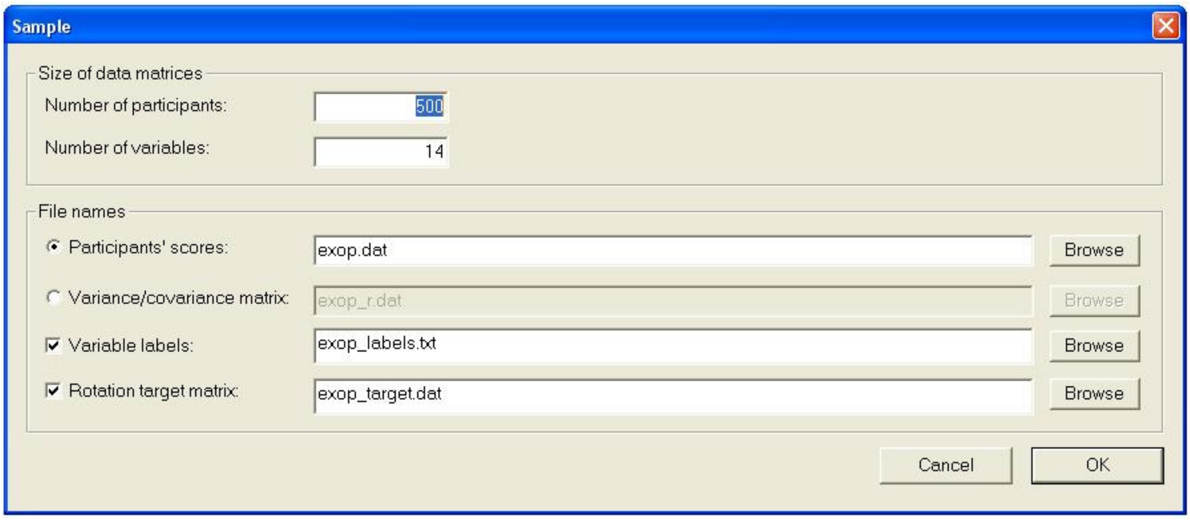
If you have your data in EXCEL, you may want to use this excel file (http://psico.fcep.urv.es/utilitats/factor/soft/data_preprocessing.xls) to pre-process the data and save it in ASCII format (please, note that you must allow macros in order to preprocess the data).

The contents of the ASCII file for this example would be:

2	**2**	**2**	**2**	**1**	**2**	**2**	**2**	**3**	**2**
1	2	1	2	1	1	3	2	3	2
3	3	3	3	2	2	2	3	2	2
2	2	2	2	2	1	2	3	2	2
...	...	...	...	...	...	...	...	...	...
2	3	2	2	1	2	2	2	2	1

where the last row contains the answers reported by the last participant. Note that the presence of missing data is not allowed. If FACTOR finds missing, the whole row is dismissed from the analysis.

The data are read from the ASCII file by clicking on the Read Data button in the main menu (see details). This button opens the menu that helps to read the data.



The above menu is now shown ready to read an ASCII file (y.dat) where the answers of 500 participants to 14 items were previously stored:

Please, note that a correlation matrix can also be read from disk. In this case, the matrix must be a square matrix. If this option is used, the program will not be able to compute all the indices available when raw data is used.

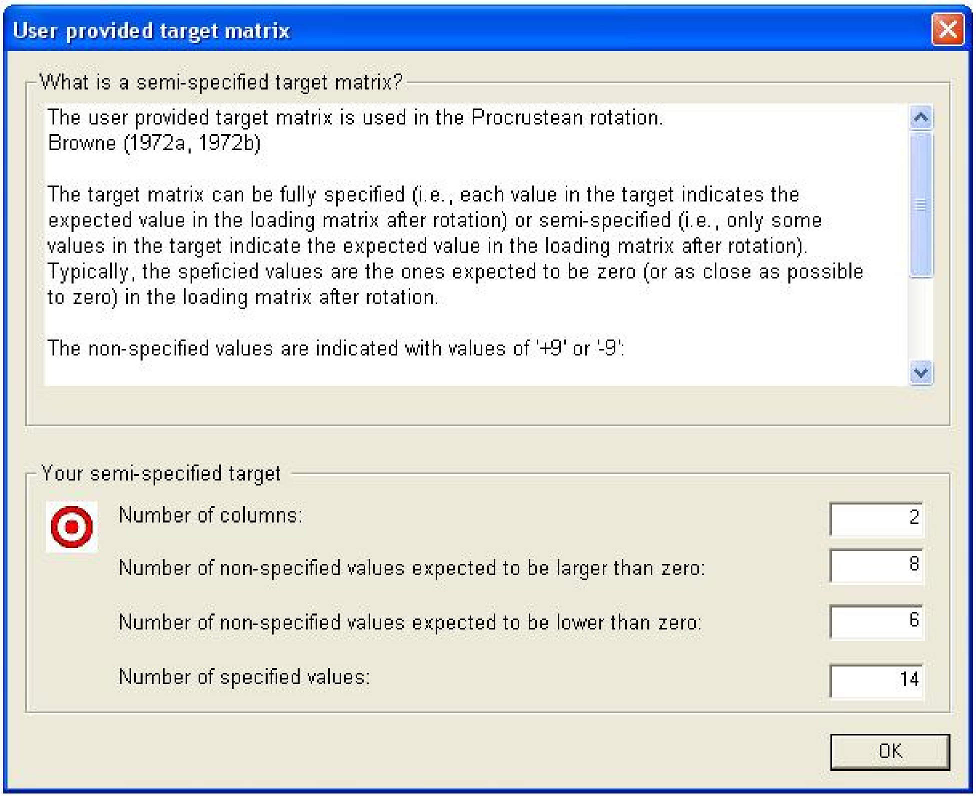
Variable labels are allowed. It must be a text file, where each rows corresponds to the labels of each variable. FACTORS expects to find as many rows, as variables. Labels with more than 40 characters are cut to be of 40 characters. The labels are used in the output report.

Finally, a rotation target matrix is also allowed. It must be a text file. The target matrix can be fully specified (i.e., each value in the target indicates the expected value in the loading matrix after rotation) or semi-specified (i.e., only some values in the target matrix indicate the expected value in the loading matrix after rotation).

Typically, the specified values are the ones expected to be zero (or as close as possible to zero) in the loading matrix after rotation. The non-specified values are indicated with values of +9 (non-specified value that is expected to be larger than zero) or -9 (non-specified value that is expected to be lower than zero). Here you have an example of a semi-specified target matrix:

9.0	0.0
9.0	0.0
-9.0	0.0
9.0	0.0
-9.0	0.0
-9.0	0.0
9.0	0.0
0.0	-9.0
0.0	9.0
0.0	-9.0
0.0	9.0
0.0	9.0
0.0	9.0
0.0	-9.0

If this target matrix is properly read, the following menu will help you to check that non errors were found:



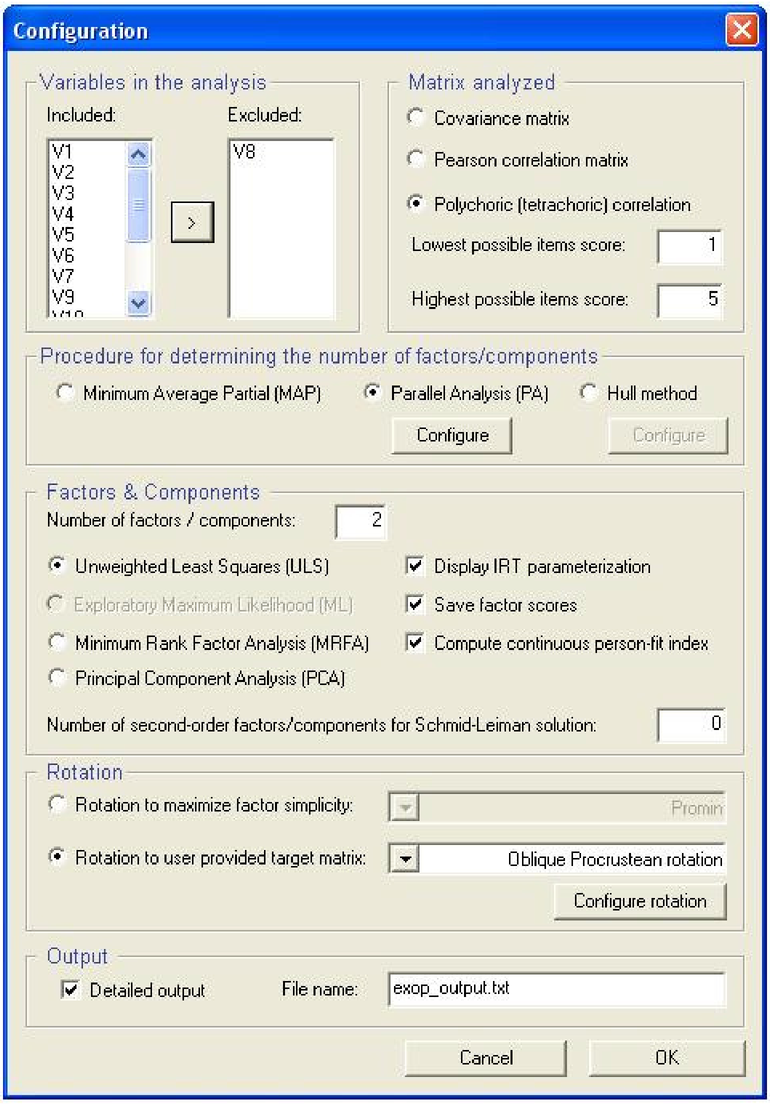
Please note that, in order to use the target matrix during the rotation, the number of factors (or components) retained must coincide with the number of columns of the target matrix.

Configure analysis

The analysis is configured by clicking on *Configure Analysis* button in the main menu (see details). Note that before starting the computation the data must be read. This button opens the menu that helps to define the analysis.

The menu is now shown ready to (a) compute polychoric correlations (with categories from 1 to 5), (b) compute parallel analysis, (c) retain two factors computed by Unweighted Least Squares factor analysis, (d) rotate the solution oblique Procuestean Rotation using the user provided target matrix, (e) display IRT parameterization, (f) compute factor scores, and (g) compute continuous person-fit indices. Note that variable 8 (i.e., the eighth column in the file) is excluded from the analysis.

In addition, the output is stored in file *exop_output.txt*.

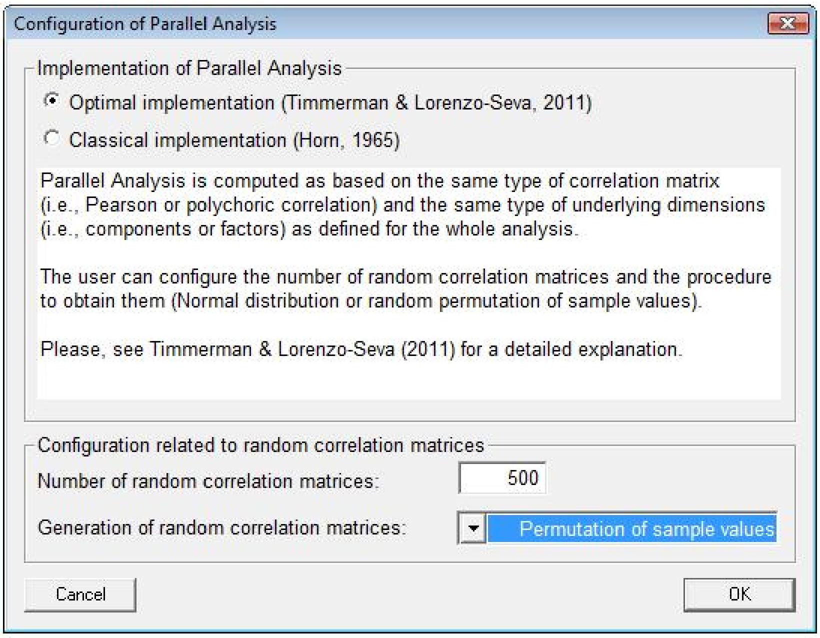


When computing the polychoric correlation, please note that:

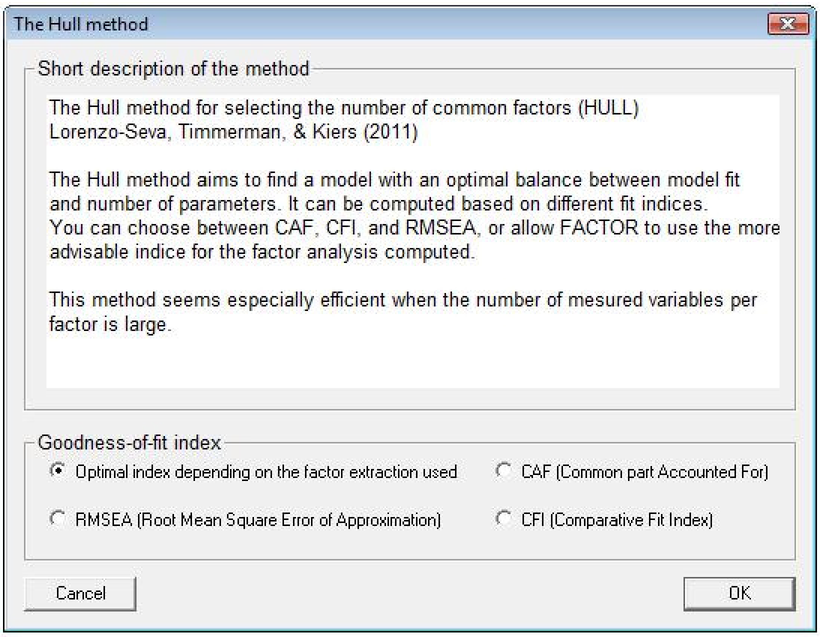
- Factor computes the lowest and the highest answer in the data, and takes these values as default values.
- A value lower than the value observed in the data is not allowed.
- All the variables are expected to have the same number of categories of response.

- If the matrix is not positive-definite, a smooth algorithm is computed to solve it.
- If a polychoric correlation coefficient cannot be computed, the corresponding Pearson correlation is computed. If a large number of polychoric correlation coefficients cannot be computed, the analysis will be based only in Pearson correlation matrices.
- If the number of Factors/Components is set to the value of zero, the greatest lower bound (glb) to reliability is computed. The glb was defined by Woodhouse and Jackson (1977), and it is computed according to the algorithm suggested by Ten Berge, Snijders and Zegers (1981) as a modification of Bentler and Woodwards method (1980). This lower bound is better than coefficient alpha, but can only be trusted in large samples, preferably 1000 cases or more, due to a positive sampling bias.

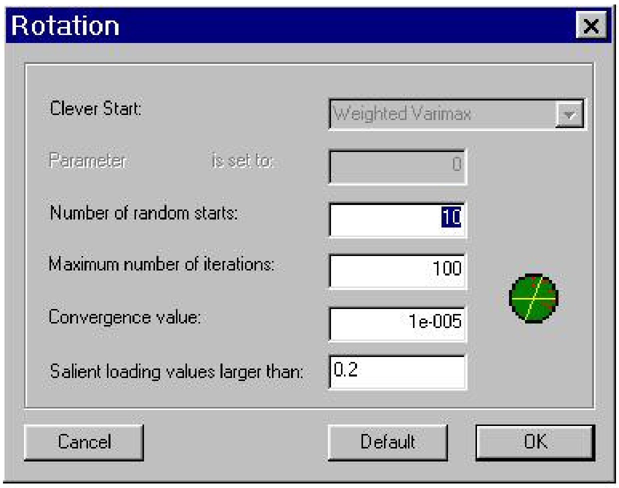
Different implementation of PA can be computed. This menu describes how PA can be configure:



Hull method is a procedure to assess the number of factors to retain. This menu describes how Hull method can be configure:



We implemented many methods to obtain simple structure. To configure the parameter values, the Configure rotation button opens the following menu:



This menu shows the default parameter values of Normalised Direct Oblimin. These values are:

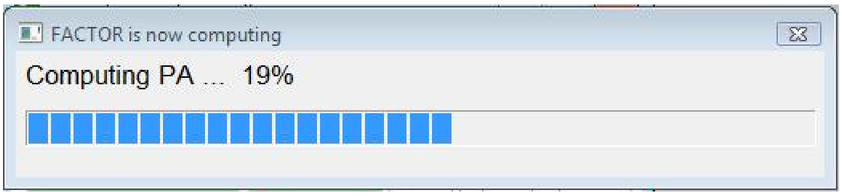
- **Clever start**: This is a pre-rotation method computed as a starting point for the Oblimin rotation.
- **Parameter gamma set to**: This defines a default value for the parameter gamma of Oblimin.
- **Number of random starts**: To avoid convergence to local maxima, each rotation is computed from a number of random starts, and the rotated solution that attains the highest criterion value is taken as *the* solution for the analysis.
- **Maximum number of iterations**: This defines the maximum number of iterations in the rotation method.
- **Convergence value**: This defines the convergence value to finish the rotation method.
- **Salient loading values larger than**: This defines the minimum value of the salient loadings to be printed in the cleaned loading matrix. If the value is set to zero, the cleaned loading matrix is not printed.

The *default* button sets the parameters of the rotation to the usual values in the literature. These values are the ones defined when the program starts.

When simplimax rotation is used, a range of salient loading values (and a final number) must be specified. This is done during the computation itself.

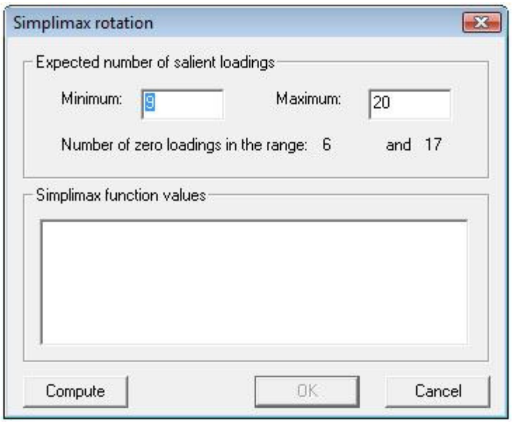
Compute

The computation is started by clicking on the Compute button in the main menu. Note that before the computation starts, the data must be read and the analysis must be configured. Once the computation begins, Factor continuously informs the user of the analysis been performed.



Please note that some analysis can take a long time, especially if you use the computer to run FACTOR and other applications simultaneously.

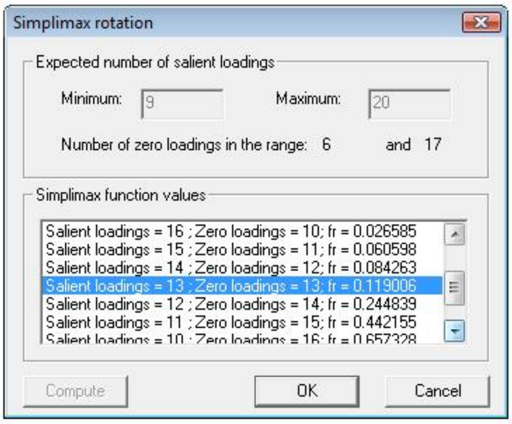
If the rotation used to obtain simplicity is Simplimax, the following menu appears,



The user must supply the range of salient loadings that could be expected in the loading matrix after rotating to simple structure. Factor suggests a maximum and a minimum for the number of salient loadings that could be expected in a perfectly simple structure (one salient loading per variable). In the example these values are 7 and 14. However, the user can define any other value.

To continue the analysis, the *Compute* button must be clicked.

After computing a rotated solution for each number of salient loadings in the range, one of the solutions must be selected as the final solution. To help the user, simplimax function values are shown, and a cut-off point is suggested: the rotated solution where after the function value shows a considerable relative increase.



Once the user selects the final rotated solution, the analysis is continued by clicking on the Ok button.

After the computation, the output of the program is stored in ASCII format in the file specified output file, for example, *exop_output.txt*.

Output

The output of the program is stored in ASCII format in specified output file (for example, *exop_output.txt*). When the analysis finishes, this file is automatically loaded (except in some versions of the operating system). It can then be edited, saved or printed like any other text file.

Follow we show the full output of an analysis.

```
                                   F A C T O R

                         Unrestricted Factor Analysis

                              Release Version 9.2
                                  February, 2013
                          Rovira i Virgili University
                              Tarragona, SPAIN

                                 Programming:
                             Urbano Lorenzo-Seva

                          Mathematical Specification:
                             Urbano Lorenzo-Seva
                               Pere J. Ferrando

                          Date: Wednesday, February 27, 2013
                          Time: 10:0:56
--------------------------------------------------------------------------------

DETAILS OF ANALYSIS

Participants' scores data file                     : exop.dat
Variable labels file                               : exop_labels.txt
Number of participants                             : 500
Number of variables                                : 14
Variables included in the analysis                 : V1, V2, V3, V4, V5, V6, V7, V9, V10, V11, V12, V13,
V14
Variables excluded in the analysis                 : V8
Number of factors                                  : 2
Number of second order factors                     : 0
Procedure for determining the number of dimensions : Optimal implementation of Parallel Analysis (PA)
                                                     (Timmerman, & Lorenzo-Seva, 2011)
Dispersion matrix                                  : Polychoric Correlations
Method for factor extraction                       : Unweighted Least Squares (ULS)
Rotation to user defined target                    : Semi-specified oblique Procrustes rotation
                                                     (Browne, 1972b)
Number of random starts                            : 10
Maximum mumber of iterations                       : 100
Convergence value                                  : 0.00001000

--------------------------------------------------------------------------------

UNIVARIATE DESCRIPTIVES

Variable                       Mean       Confidence Interval     Variance   Skewness     Kurtosis
                                               (95%)                                   (Zero centered)

1. Extraversion +              2.986     (    2.88      3.09)      0.838     -0.113        0.004
2. Extraversion +              3.802     (    3.71      3.89)      0.639     -0.712        0.887
3. Extraversion -              2.324     (    2.20      2.45)      1.263      0.549       -0.492
4. Extraversion +              3.616     (    3.51      3.72)      0.837     -0.440       -0.087
5. Extraversion -              3.570     (    3.46      3.68)      0.957     -0.248       -0.314
6. Extraversion -              3.092     (    2.98      3.20)      0.912     -0.019       -0.376
7. Extraversion +              3.318     (    3.22      3.41)      0.701     -0.223        0.290
9. Openness +                  4.610     (    4.54      4.68)      0.326     -1.278        1.332
10. Openness -                 2.588     (    2.45      2.72)      1.418      0.367       -0.761
11. Openness +                 3.522     (    3.41      3.63)      0.950     -0.419       -0.151
12. Openness +                 4.502     (    4.42      4.58)      0.478     -1.626        3.792
13. Openness +                 4.428     (    4.35      4.50)      0.437     -0.983        1.113
14. Openness -                 1.866     (    1.75      1.98)      0.992      1.098        0.661
```

Polychoric correlation is advised when the univariate distributions of ordinal items are asymmetric or with excess of kurtosis. If both indices are lower than one in absolute value, then Pearson correlation is advised. You can read more about this subject in:

Muthén, B., & Kaplan D. (1985). A comparison of some methodologies for the factor analysis of non-normal Likert variables. British Journal of Mathematical and Statistical Psychology, 38, 171-189.
Muthén, B., & Kaplan D. (1992). A comparison of some methodologies for the factor analysis of non-normal Likert variables: A note on the size of the model. British Journal of Mathematical and Statistical Psychology, 45, 19-30.

BAR CHARTS FOR ORDINAL VARIABLES

```
Variable    1

 Value     Freq
                |
    1       31  |  *****
    2       98  |  ****************
    3      240  |  ****************************************
    4      109  |  ******************
    5       22  |  ***
                +-----------+---------+---------+-----------+
                 0        60.0       120.0       180.0        240.0

Variable    2

 Value     Freq
                |
    1        5  |
    2       26  |  ***
    3      111  |  ***************
    4      279  |  ****************************************
    5       79  |  ***********
                +-----------+---------+---------+-----------+
                 0        69.8       139.5       209.3        279.0

Variable    3

 Value     Freq
                |
    1      139  |  **********************************
    2      161  |  ****************************************
    3      120  |  *****************************
    4       59  |  **************
    5       21  |  *****
                +-----------+---------+---------+-----------+
                 0        40.3       80.5       120.8        161.0

Variable    4

 Value     Freq
                |
    1        8  |  *
    2       49  |  ********
    3      147  |  **************************
    4      219  |  ****************************************
    5       77  |  **************
                +-----------+---------+---------+-----------+
                 0        54.8       109.5       164.3        219.0

Variable    5

 Value     Freq
                |
    1       12  |  **
    2       45  |  *********
    3      186  |  ****************************************
    4      160  |  **********************************
    5       97  |  ********************
                +-----------+---------+---------+-----------+
                 0        46.5       93.0       139.5        186.0
```

```
Variable    6

 Value     Freq
                |
     1      21  |  ****
     2     111  |  *********************
     3     202  |  ****************************************
     4     133  |  **************************
     5      33  |  ******
                +-----------+---------+---------+-----------+
                 0        50.5       101.0       151.5        202.0

Variable    7

 Value     Freq
                |
     1      12  |  **
     2      52  |  ********
     3     234  |  ****************************************
     4     169  |  ****************************
     5      33  |  *****
                +-----------+---------+---------+-----------+
                 0        58.5       117.0       175.5        234.0

Variable    9

 Value     Freq
                |
     2       2  |
     3      16  |  *
     4     157  |  *******************
     5     325  |  ****************************************
                +-----------+---------+---------+-----------+
                 0        81.3       162.5       243.8        325.0

Variable   10

 Value     Freq
                |
     1     103  |  **************************
     2     154  |  ***************************************
     3     126  |  ********************************
     4      80  |  ********************
     5      37  |  *********
                +-----------+---------+---------+-----------+
                 0        38.5       77.0       115.5        154.0

Variable   11

 Value     Freq
                |
     1      15  |  ***
     2      55  |  ***********
     3     159  |  ********************************
     4     196  |  ****************************************
     5      75  |  ***************
                +-----------+---------+---------+-----------+
                 0        49.0       98.0       147.0        196.0

Variable   12

 Value     Freq
                |
     1       3  |
     2       4  |
     3      27  |  ***
     4     171  |  ***********************
     5     295  |  ****************************************
                +-----------+---------+---------+-----------+
                 0        73.8       147.5       221.3        295.0

Variable   13

 Value     Freq
```

```
                |
     1       1  |
     2       2  |
     3      36  |  *****
     4     204  |  *******************************
     5     257  |  ****************************************
                +-----------+---------+---------+-----------+
                 0        64.3       128.5      192.8        257.0
```

Variable   14

```
 Value     Freq
                |
     1     228  |  ****************************************
     2     159  |  ***************************
     3      75  |  *************
     4      28  |  ****
     5      10  |  *
                +-----------+---------+---------+-----------+
                 0        57.0       114.0      171.0        228.0
```

MULTIVARIATE DESCRIPTIVES

Analysis of the Mardia's (1970) multivariate asymmetry skewness and kurtosis.

	Coefficient	Statistic	df	P
Skewness	16.412	1367.648	455	1.0000
SKewness corrected for small sample	16.412	1377.032	455	1.0000
Kurtosis	225.549	17.295		0.0000**

** Significant at 0.05

WARNING: 12 polychoric correlation coeficients did not converge. Pearson correlation coefficients were computed and inserted in the polychoric correlation matrix.

Pairs of variables with Pearson correlation coeffcients

```
Variable   1  -- Variable   9
Variable   2  -- Variable   9
Variable   3  -- Variable   9
Variable   4  -- Variable   9
Variable   5  -- Variable   9
Variable   6  -- Variable   9
Variable   7  -- Variable   9
Variable   9  -- Variable  10
Variable   9  -- Variable  11
Variable   9  -- Variable  12
Variable   9  -- Variable  13
Variable   9  -- Variable  14
```

STANDARIZED VARIANCE / COVARIANCE MATRIX (POLYCHORIC CORRELATION)
(Polychoric algorithm: Olsson ,1979a, 1979b; Tetrachoric algorithm: AS116)

Variable	1	2	3	4	5	6	7	9	10	11	12	13	14
V 1	1.000												
V 2	0.405	1.000											
V 3	-0.409	-0.507	1.000										
V 4	0.437	0.644	-0.495	1.000									
V 5	-0.413	-0.306	0.394	-0.145	1.000								
V 6	-0.372	-0.438	0.443	-0.313	0.634	1.000							
V 7	0.398	0.451	-0.355	0.477	-0.279	0.383	1.000						
V 9	-0.022	0.098	0.004	0.100	0.029	0.004	0.054	1.000					

V 10	-0.025	-0.096	0.083	-0.043	0.187	0.172	-0.144	-0.142	1.000				
V 11	0.007	0.063	-0.035	0.064	-0.117	-0.076	0.123	0.280	-0.254	1.000			
V 12	0.093	0.253	-0.131	0.213	-0.083	-0.076	0.065	0.172	-0.174	0.277	1.000		
V 13	0.057	0.239	-0.115	0.204	-0.055	-0.073	0.148	0.310	-0.302	0.349	0.532	1.000	
V 14	-0.087	-0.155	0.098	-0.058	0.006	0.024	-0.166	-0.226	0.303	-0.409	-0.342	-0.359	1.000

ADEQUACY OF THE CORRELATION MATRIX

Determinant of the matrix = 0.044363124313138
Bartlett's statistic = 1538.5 (df = 78; P = 0.000010)
Kaiser-Meyer-Olkin (KMO) test = 0.79067 (fair)

EXPLAINED VARIANCE BASED ON EIGENVALUES

Variable	Eigenvalue	Proportion of Variance	Cumulative Proportion of Variance
1	3.80202	0.29246	0.29246
2	2.25135	0.17318	0.46564
3	1.21603	0.09354	
4	0.88513	0.06809	
5	0.82548	0.06350	
6	0.75776	0.05829	
7	0.62492	0.04807	
8	0.61376	0.04721	
9	0.53850	0.04142	
10	0.46816	0.03601	
11	0.40806	0.03139	
12	0.33463	0.02574	
13	0.27420	0.02109	

PARALLEL ANALYSIS (PA) BASED ON MINIMUM RANK FACTOR ANALYSIS
(Timmerman & Lorenzo-Seva, 2011)

Implementation details:

Correlation matrices analized: Polychoric correlation matrices
Number of random correlation matrices: 500
Method to obtain random correlation matrices: Permutation of the raw data (Buja & Eyuboglu, 1992)

Variable	Real-data % of variance	Mean of random % of variance	95 percentile of random % of variance
1	32.8*	15.6	18.1
2	19.5*	14.1	16.2
3	10.7	12.7	14.2
4	7.6	11.4	12.8
5	6.7	10.1	11.3
6	6.4	8.8	9.8
7	5.2	7.6	8.7
8	3.5	6.4	7.7
9	2.9	5.2	6.6
10	2.3	4.0	5.4
11	1.5	2.7	4.1
12	1.0	1.4	2.7
13	0.0	0.0	0.0

* Advised number of dimensions: 2

GOODNESS OF FIT STATISTICS

Goodness of Fit Index (GFI) = 0.97

EIGENVALUES OF THE REDUCED CORRELATION MATRIX

Variable	Eigenvalue
1	3.224562485
2	1.614453303
3	0.582320635
4	0.235160290
5	0.105669471
6	0.047778124
7	0.025145429
8	-0.031587533
9	-0.074481276
10	-0.138798009
11	-0.173150385
12	-0.234133920
13	-0.343924678

UNROTATED LOADING MATRIX

Variable	F 1	F 2	Communality
1. Extraversion +	0.565	-0.272	0.393
2. Extraversion +	0.731	-0.125	0.550
3. Extraversion -	-0.637	0.242	0.465
4. Extraversion +	0.647	-0.140	0.439
5. Extraversion -	-0.510	0.228	0.312
6. Extraversion -	-0.611	0.272	0.447
7. Extraversion +	0.587	-0.125	0.361
9. Openness +	0.168	0.373	0.167
10. Openness -	-0.269	-0.304	0.165
11. Openness +	0.267	0.489	0.311
12. Openness +	0.367	0.458	0.345
13. Openness +	0.409	0.601	0.528
14. Openness -	-0.306	-0.513	0.357

SEMI-SPECIFIED TARGET LOADING MATRIX
User defined semi-specified target matrix

Variable	F 1	F 2
1. Extraversion +	---	0.000
2. Extraversion +	---	0.000
3. Extraversion -	---	0.000
4. Extraversion +	---	0.000
5. Extraversion -	---	0.000
6. Extraversion -	---	0.000
7. Extraversion +	---	0.000
9. Openness +	0.000	---
10. Openness -	0.000	---
11. Openness +	0.000	---
12. Openness +	0.000	---
13. Openness +	0.000	---
14. Openness -	0.000	---

ROTATED LOADING MATRIX

Variable	F 1	F 2
1. Extraversion +	0.649	-0.100
2. Extraversion +	0.707	0.097
3. Extraversion -	-0.695	0.049
4. Extraversion +	0.644	0.056
5. Extraversion -	-0.576	0.073
6. Extraversion -	-0.689	0.087
7. Extraversion +	0.583	0.053
9. Openness +	-0.073	0.425
10. Openness -	-0.055	-0.386

11. Openness +	-0.055	0.571
12. Openness +	0.051	0.570
13. Openness +	0.003	0.726
14. Openness -	0.035	-0.607

ROTATED LOADING MATRIX
(loadings lower than absolute 0.300 omitted)

Variable	F 1	F 2
1. Extraversion +	0.649	
2. Extraversion +	0.707	
3. Extraversion -	-0.695	
4. Extraversion +	0.644	
5. Extraversion -	-0.576	
6. Extraversion -	-0.689	
7. Extraversion +	0.583	
9. Openness +		0.425
10. Openness -		-0.386
11. Openness +		0.571
12. Openness +		0.570
13. Openness +		0.726
14. Openness -		-0.607

EXPLAINED VARIANCE AND RELIABILITY OF ROTATED FACTORS
Mislevy & Bock (1990)

Factor	Variance	Reliability estimate
1	2.951	0.842
2	1.888	0.758

INTER-FACTORS CORRELATION MATRIX

Factor	F 1	F 2
F 1	1.000	
F 2	0.294	1.000

STRUCTURE MATRIX

Variable	F 1	F 2
1. Extraversion +	0.620	0.091
2. Extraversion +	0.736	0.305
3. Extraversion -	-0.680	-0.156
4. Extraversion +	0.660	0.246
5. Extraversion -	-0.554	-0.097
6. Extraversion -	-0.664	-0.116
7. Extraversion +	0.598	0.225
9. Openness +	0.052	0.403
10. Openness -	-0.169	-0.402
11. Openness +	0.113	0.555
12. Openness +	0.218	0.585
13. Openness +	0.217	0.727
14. Openness -	-0.144	-0.597

CONGRUENCE BETWEEN ROTATED LOADING MATRIX AND TARGET MATRIX
Tucker (1951)

CONGRUENCE OF VARIABLES

Variable	Congruence
1. Extraversion +	0.988
2. Extraversion +	0.991
3. Extraversion -	0.998
4. Extraversion +	0.996

5. Extraversion -	0.992
6. Extraversion -	0.992
7. Extraversion +	0.996
9. Openness +	0.986
10. Openness -	0.990
11. Openness +	0.995
12. Openness +	0.996
13. Openness +	1.000
14. Openness -	0.998

CONGRUENCE OF FACTORS

Factor	Congruence
F 1	0.995
F 2	0.969

OVERALL CONGRUENCE : 0.981

GUIDELINEs TO INTERPRET CONGRUENCE INDEX
Lorenzo-Seva & ten Berge (2006)

A congruence value in the range .85-.94 corresponds to a fair similarity, while a value higher than .95 implies that the two factors (or components) compared can be considered equal.

Note: non-specified values in the target matrix were set to 1 (or -1) to compute congruences.

ITEM RESPONSE THEORY PARAMETERIZATION: MULTIDIMENSIONAL NORMAL-OGIVE GRADED RESPONSE MODEL
Reckase's parameterization (Reckase, 1985)

PATTERN OF ITEM DISCRIMINATIONS

Item	a 1	a 2	MDISC
1. Extraversion +	0.833	-0.129	0.843
2. Extraversion +	1.053	0.145	1.063
3. Extraversion -	-0.950	0.067	0.952
4. Extraversion +	0.859	0.075	0.862
5. Extraversion -	-0.694	0.088	0.699
6. Extraversion -	-0.927	0.117	0.935
7. Extraversion +	0.729	0.066	0.732
9. Openness +	-0.080	0.465	0.472
10. Openness -	-0.060	-0.422	0.427
11. Openness +	-0.066	0.688	0.691
12. Openness +	0.063	0.704	0.707
13. Openness +	0.005	1.057	1.057
14. Openness -	0.043	-0.757	0.758

a: item discrimination in each dimension
MDISC: item multidimensional discrimination

CATEGORY INTERCEPTS

Item	d 1	d 2	d 3	d 4
1. Extraversion +	-1.940	-0.820	0.805	2.139
2. Extraversion +	-3.248	-2.196	-0.817	1.488
3. Extraversion -	-0.813	0.329	1.327	2.305
4. Extraversion +	-2.728	-1.562	-0.295	1.354
5. Extraversion -	-2.298	-1.411	-0.034	1.040
6. Extraversion -	-2.269	-0.835	0.578	1.993
7. Extraversion +	0.000	0.000	0.000	0.000
9. Openness +	0.000	0.000	0.000	0.000
10. Openness -	-0.898	0.038	0.794	1.583
11. Openness +	-2.196	-1.267	-0.117	1.242
12. Openness +	-2.841	-2.455	-1.727	-0.251
13. Openness +	-3.591	-3.137	-1.946	-0.023

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14. Openness -                                -0.157    0.901    1.720    2.458


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DISTRIBUTION OF RESIDUALS

Number of Residuals = 78

Summary Statistics for Fitted Residuals

Smallest Fitted Residual = -0.0932
  Median Fitted Residual =  0.0146
 Largest Fitted Residual =  0.2606
    Mean Fitted Residual =  0.0183
Variance Fitted Residual =  0.0037

               Root Mean Square of Residuals (RMSR) =  0.0639
Expected mean value of RMSR for an acceptable model =  0.0448 (Kelley's criterion) (Kelley, 1935,page 146;
see also Harman, 1962, page 21 of the 2nd edition)
Note: if the value of RMSR is much larger than Kelley's criterion value the model cannot be considered as
good


Histogram for fitted residuals


 Value        Freq
                  |
   -0.0932      3 |  ****
   -0.0578     11 |  *****************
   -0.0224     13 |  ********************
    0.0130     25 |  ****************************************
    0.0483     14 |  **********************
    0.0837      6 |  *********
    0.1191      3 |  ****
    0.1545      1 |  *
    0.1898      0 |
    0.2252      1 |  *
    0.2606      1 |  *
                  +-----------+---------+---------+-----------+
                    0        6.3       12.5       18.8        25.0


Summary Statistics for Standardized Residuals

Smallest Standardized Residual = -2.08
  Median Standardized Residual =  0.33
 Largest Standardized Residual =  5.82
    Mean Standardized Residual =  0.41

Stemleaf Plot for Standardized Residuals

  -2 | 11
  -1 | 7644221100
  -0 | 9977554333222221
   0 | 00111122333444444555566777999
   1 | 000112444578
   2 | 001477
   3 | 4
   4 | 8
   5 | 8


Largest Positive Standardized Residuals

Residual for Var   4 and Var   2     3.43
Residual for Var   5 and Var   4     4.84
Residual for Var   6 and Var   4     2.70
Residual for Var   6 and Var   5     5.82
Residual for Var  10 and Var   5     2.66

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PARTICIPANTS' SCORES ON FACTORS:
Bayes Expected A Posteriori (EAP)
Muraki (1990)

Case	Factor 1	Factor 2
1	2.496	0.996
2	1.197	1.114
3	-0.008	-0.461
4	0.144	-0.963
5	-0.224	-1.091
6	-1.822	-0.198
7	0.387	0.084
8	0.821	0.733
9	0.015	1.111
10	0.568	0.085
11	-1.973	1.159
12	0.859	0.812
13	2.751	1.184
14	0.383	0.247
15	1.607	0.617
16	-0.089	-0.091
17	-0.026	0.095
18	-0.355	-0.436
19	-1.825	0.474
20	-1.375	0.134
21	-0.059	-1.612
22	-0.011	-0.430
23	-1.325	-0.003
24	1.079	1.399
25	-0.731	-0.497
26	-0.806	-0.496
27	2.247	1.609
28	-0.039	-0.873
29	1.107	-0.230
30	0.672	0.654
31	-0.499	-0.176
32	-0.014	-0.497
33	-0.473	-1.261
34	-1.383	-0.447
35	-0.206	-0.770
36	0.412	1.243
37	-0.210	-0.504
38	0.157	0.774
39	-1.183	0.766
40	0.206	1.187
41	0.588	-0.189
42	-0.969	0.763
43	0.427	0.050
44	0.848	1.582
45	0.906	-0.596
46	-0.591	0.492
47	-0.893	-0.339
48	-1.026	0.502
49	-0.108	0.380
50	-0.291	0.295
51	-0.485	0.823
52	-0.495	-0.910
53	-0.580	-0.438
54	0.584	-0.629
55	1.453	0.226
56	0.056	0.418
57	0.687	-0.924
58	0.344	-1.798
59	-0.181	-0.092
60	-0.639	0.731
61	-0.168	-1.272
62	-1.961	0.224
63	1.236	0.654
64	1.593	1.721
65	0.016	0.260
66	-0.313	0.397
67	0.122	0.621

68	-0.813	0.693
69	0.373	0.449
70	0.409	1.676
71	-0.014	1.419
72	-0.202	-1.118
73	0.139	-1.228
74	1.672	-0.509
75	0.629	1.652
76	-0.511	0.971
77	-1.001	-0.470
78	-0.330	0.396
79	-0.413	0.341
80	0.655	0.964
81	0.969	-0.840
82	-0.880	1.415
83	-2.473	-0.392
84	0.587	0.180
85	0.333	-0.498
86	-0.376	-0.016
87	0.742	-0.614
88	-0.198	0.332
89	0.296	0.224
90	0.472	-0.552
91	1.044	1.322
92	-0.940	1.236
93	-0.668	0.125
94	0.195	0.524
95	0.659	1.540
96	0.471	-0.136
97	0.844	1.347
98	1.317	0.925
99	-0.162	-0.680
100	-0.311	-0.836
101	-0.645	0.486
102	0.249	0.999
103	0.383	0.478
104	-0.498	1.412
105	-0.107	0.591
106	-0.551	0.070
107	-0.635	0.599
108	1.663	0.194
109	0.007	-0.518
110	-0.879	-0.389
111	0.150	0.272
112	0.426	1.402
113	-0.228	-0.506
114	-0.026	0.641
115	-0.410	-1.121
116	0.671	0.548
117	0.192	0.530
118	0.120	0.555
119	1.442	0.848
120	-0.464	-0.041
121	-0.447	0.370
122	-0.081	-1.110
123	0.547	-0.643
124	0.852	1.080
125	-1.356	0.256
126	-0.134	0.347
127	0.548	-1.407
128	-0.059	-0.549
129	0.615	0.342
130	-0.420	-0.851
131	-0.138	-0.751
132	-0.544	-0.037
133	-0.631	-0.423
134	0.566	0.861
135	0.916	0.652
136	0.621	-0.087
137	0.387	-0.104
138	-0.427	0.099
139	0.834	-0.283
140	-0.992	0.640
141	1.604	-0.194

142	-0.684	-0.172
143	-1.056	-0.163
144	1.003	-0.188
145	-0.474	-0.800
146	0.977	0.220
147	0.600	-0.659
148	0.330	-0.026
149	0.763	-0.022
150	-0.185	-0.743
151	-0.101	1.258
152	1.332	0.035
153	1.402	0.252
154	1.266	0.610
155	0.399	0.588
156	0.419	0.613
157	1.376	0.910
158	0.173	-0.355
159	0.846	0.549
160	1.047	0.534
161	1.163	0.640
162	0.166	-0.073
163	-0.301	-0.807
164	-0.284	0.236
165	0.578	0.849
166	-0.201	0.034
167	0.061	0.785
168	0.545	-0.763
169	0.226	-0.400
170	-0.027	0.418
171	0.168	1.166
172	0.686	-1.512
173	-0.117	1.638
174	0.607	-1.249
175	-0.664	0.017
176	1.454	-0.454
177	-0.785	0.509
178	1.145	-0.176
179	0.686	-0.613
180	-0.502	-0.103
181	-0.902	0.108
182	1.002	0.955
183	0.350	0.178
184	0.128	0.666
185	-0.249	-0.353
186	-0.469	-0.191
187	-0.299	0.633
188	-0.456	-1.269
189	0.671	0.540
190	1.106	-1.339
191	1.031	0.046
192	0.033	0.869
193	-1.920	0.739
194	0.051	1.092
195	1.103	0.767
196	0.134	-0.647
197	0.126	0.048
198	-0.581	-0.364
199	-0.375	0.610
200	-0.710	-0.336
201	-0.569	1.173
202	0.421	0.814
203	-0.267	-0.039
204	2.142	0.537
205	-0.291	0.474
206	0.190	-0.161
207	-0.030	0.810
208	0.764	1.055
209	0.805	0.974
210	1.671	0.491
211	0.341	1.166
212	1.049	-0.255
213	0.467	0.369
214	-0.673	-0.870
215	0.418	0.410

216	-0.562	-0.477
217	-0.662	-0.172
218	0.147	-0.460
219	0.585	1.211
220	-1.405	-1.050
221	0.473	0.758
222	0.936	-0.821
223	0.928	0.489
224	0.193	0.532
225	0.131	-0.560
226	1.016	-0.045
227	-0.131	0.079
228	0.461	-0.541
229	0.192	-0.092
230	-0.156	-0.621
231	2.405	-0.250
232	-0.894	-0.297
233	0.894	-0.168
234	-0.510	1.220
235	-0.261	0.009
236	-0.017	1.539
237	-0.882	-1.083
238	-0.647	1.303
239	-0.349	-0.408
240	0.609	-0.554
241	0.217	0.476
242	0.429	0.890
243	0.025	-0.092
244	-0.553	0.243
245	-0.885	-0.523
246	1.229	1.866
247	0.102	-0.535
248	-0.478	-0.404
249	0.241	-0.365
250	0.607	0.608
251	-0.975	-0.276
252	-1.032	0.002
253	1.621	0.356
254	-0.059	-0.549
255	1.053	-0.051
256	0.376	-0.314
257	-0.837	-0.067
258	0.465	0.176
259	0.475	-0.111
260	1.100	0.011
261	-0.755	-1.504
262	0.193	-0.056
263	-0.620	0.552
264	-0.460	1.422
265	0.766	-0.408
266	0.820	0.830
267	-0.238	-0.259
268	-0.023	0.863
269	-0.317	0.002
270	-0.819	-0.122
271	0.190	1.160
272	1.043	-0.498
273	0.739	0.841
274	-0.120	-0.514
275	-1.540	-0.421
276	0.625	1.198
277	-0.657	0.643
278	-0.720	-1.448
279	0.582	0.011
280	-0.465	-0.603
281	0.197	0.600
282	-0.002	0.004
283	-0.019	0.507
284	-0.026	-0.435
285	-1.213	-0.169
286	0.859	-0.368
287	-1.421	1.298
288	0.613	-0.311
289	-0.306	1.227

290	1.090	1.005
291	0.477	-0.014
292	-0.484	-0.341
293	-1.157	1.500
294	-0.855	-0.800
295	1.604	-0.425
296	2.716	0.587
297	-0.019	-0.199
298	0.492	0.407
299	-0.016	0.668
300	-0.879	1.263
301	0.944	1.644
302	1.468	-0.118
303	0.191	0.462
304	1.078	0.930
305	0.411	-0.030
306	-0.820	-0.513
307	1.358	-1.774
308	-0.103	0.503
309	0.126	0.710
310	0.677	1.625
311	0.218	1.493
312	-0.684	0.128
313	0.740	1.128
314	0.776	0.150
315	0.150	0.177
316	0.116	-0.169
317	0.800	0.254
318	1.024	0.202
319	-0.678	1.818
320	-0.362	-0.291
321	0.644	0.668
322	-0.955	-0.710
323	0.603	1.333
324	-0.659	-1.575
325	0.537	-0.071
326	-0.484	-1.411
327	0.820	0.830
328	0.789	-0.409
329	-0.933	1.158
330	0.126	1.963
331	1.850	-0.028
332	-0.106	-0.215
333	-0.189	-0.220
334	0.445	0.636
335	0.569	0.442
336	1.071	0.872
337	-0.849	1.560
338	1.493	1.810
339	-0.742	1.256
340	0.505	0.352
341	0.186	-1.110
342	-0.348	-1.451
343	0.178	-0.242
344	0.149	1.062
345	1.245	0.069
346	0.365	-0.039
347	-0.091	0.706
348	0.917	0.404
349	1.131	-0.232
350	-0.699	-0.683
351	-0.314	0.100
352	0.872	-0.151
353	-0.264	0.251
354	1.032	0.439
355	0.131	-0.175
356	-0.105	0.410
357	0.547	-0.936
358	-1.651	-0.215
359	-1.958	0.696
360	-0.402	1.311
361	-0.535	0.215
362	-0.522	1.114
363	1.698	1.610

364	0.592	1.293
365	0.852	0.538
366	-1.425	-0.001
367	-0.092	0.090
368	0.128	-0.722
369	-0.143	0.632
370	0.627	0.789
371	-0.231	-0.891
372	-0.050	-0.353
373	0.595	-0.450
374	-0.859	0.734
375	0.818	-0.598
376	1.698	1.610
377	2.350	0.460
378	-0.649	-1.697
379	1.218	0.760
380	0.368	0.434
381	-0.176	-0.055
382	-0.335	0.852
383	0.119	1.603
384	0.034	-0.578
385	1.393	1.501
386	-0.047	0.642
387	0.392	0.645
388	0.949	1.276
389	0.713	0.979
390	0.007	-0.241
391	0.007	-0.241
392	0.780	0.708
393	0.965	1.341
394	0.619	-0.446
395	0.689	-0.530
396	-0.149	-0.569
397	-0.169	1.463
398	-0.090	1.347
399	-1.246	1.024
400	0.770	-0.651
401	0.916	0.931
402	1.045	0.851
403	-0.017	-0.079
404	-0.509	1.220
405	-0.690	-0.858
406	-0.805	-0.391
407	-0.004	-0.227
408	-0.594	1.254
409	1.486	0.858
410	1.899	-0.230
411	-0.696	1.351
412	0.460	1.224
413	-0.807	1.979
414	-0.910	0.568
415	1.383	-0.436
416	0.402	1.739
417	0.998	-0.304
418	-0.118	0.425
419	-0.800	-0.356
420	0.150	0.721
421	0.388	0.594
422	-1.183	-0.051
423	0.200	-0.537
424	-1.758	0.244
425	0.090	-0.641
426	-1.318	1.140
427	1.670	0.404
428	-0.495	0.337
429	-2.519	-1.561
430	-0.276	1.078
431	-1.781	0.058
432	0.860	0.867
433	2.267	1.221
434	0.532	0.441
435	-2.100	-0.238
436	-0.698	-0.147
437	0.905	1.772

438	-0.883	-0.086
439	-1.523	-0.564
440	0.357	1.550
441	0.822	-0.473
442	0.348	-0.016
443	0.531	0.371
444	0.560	1.188
445	0.591	-0.855
446	0.542	-1.475
447	-0.488	-0.463
448	-0.255	-0.224
449	-0.121	-0.593
450	0.560	-0.196
451	1.233	0.902
452	-0.245	0.169
453	-1.620	-0.617
454	0.896	0.232
455	-0.665	-1.339
456	-0.482	-0.859
457	-0.195	0.135
458	-0.570	-0.093
459	0.039	0.739
460	-0.235	-0.704
461	0.157	-0.266
462	0.961	0.376
463	0.023	-0.097
464	-1.006	-0.216
465	0.466	1.999
466	-0.216	-0.539
467	-0.209	0.125
468	1.836	-0.497
469	0.449	0.491
470	0.477	0.162
471	0.872	-0.328
472	0.087	-0.004
473	-0.334	0.844
474	1.450	0.728
475	-0.488	-0.830
476	-0.703	0.037
477	-0.441	-0.503
478	-0.318	-0.259
479	-0.531	0.181
480	1.957	1.724
481	-1.511	-1.437
482	1.161	-0.547
483	2.110	1.242
484	-1.467	-0.676
485	0.007	0.025
486	-1.062	-0.611
487	1.161	-0.237
488	-2.241	1.115
489	-1.444	-0.927
490	0.600	0.894
491	1.710	0.681
492	-0.637	-0.609
493	-0.392	0.012
494	-0.228	0.033
495	-0.657	1.446
496	0.054	-1.522
497	-1.002	0.442
498	1.582	0.280
499	0.336	0.386
500	0.556	-0.404

PRECISION OF FACTOR SCORES

FACTOR: 1

Case	Approximate 95% confidence interval	Posterior SE	Reliability
1	(1.448 3.543)	0.535	0.714
2	(0.260 2.135)	0.478	0.771

3	(-0.837	0.822)	0.423	0.821
4	(-0.679	0.967)	0.420	0.824
5	(-1.043	0.594)	0.418	0.826
6	(-2.655	-0.989)	0.425	0.819
7	(-0.444	1.219)	0.424	0.820
8	(-0.037	1.679)	0.438	0.808
9	(-0.833	0.864)	0.433	0.813
10	(-0.285	1.421)	0.435	0.811
11	(-2.857	-1.089)	0.451	0.797
12	(-0.036	1.754)	0.456	0.792
13	(1.644	3.858)	0.565	0.681
14	(-0.436	1.201)	0.418	0.825
15	(0.721	2.493)	0.452	0.796
16	(-0.921	0.743)	0.424	0.820
17	(-0.937	0.885)	0.465	0.784
18	(-1.312	0.602)	0.488	0.762
19	(-2.839	-0.811)	0.517	0.732
20	(-2.287	-0.464)	0.465	0.784
21	(-0.903	0.785)	0.431	0.815
22	(-0.829	0.806)	0.417	0.826
23	(-2.230	-0.420)	0.462	0.787
24	(0.198	1.960)	0.450	0.798
25	(-1.526	0.065)	0.406	0.835
26	(-1.693	0.081)	0.452	0.795
27	(1.168	3.325)	0.550	0.697
28	(-0.855	0.778)	0.416	0.827
29	(0.261	1.953)	0.432	0.814
30	(-0.216	1.560)	0.453	0.795
31	(-1.389	0.392)	0.454	0.794
32	(-0.889	0.861)	0.446	0.801
33	(-1.347	0.401)	0.446	0.801
34	(-2.278	-0.488)	0.457	0.792
35	(-1.025	0.613)	0.418	0.825
36	(-0.408	1.231)	0.418	0.825
37	(-1.039	0.619)	0.423	0.821
38	(-0.745	1.059)	0.460	0.788
39	(-1.992	-0.374)	0.413	0.829
40	(-0.626	1.039)	0.425	0.820
41	(-0.246	1.423)	0.426	0.819
42	(-1.796	-0.141)	0.422	0.822
43	(-0.430	1.283)	0.437	0.809
44	(-0.013	1.709)	0.439	0.807
45	(0.060	1.751)	0.431	0.814
46	(-1.402	0.220)	0.414	0.829
47	(-1.681	-0.106)	0.402	0.839
48	(-1.824	-0.227)	0.407	0.834
49	(-1.044	0.828)	0.478	0.772
50	(-1.133	0.550)	0.429	0.816
51	(-1.310	0.341)	0.421	0.823
52	(-1.316	0.327)	0.419	0.824
53	(-1.446	0.287)	0.442	0.805
54	(-0.270	1.437)	0.436	0.810
55	(0.536	2.370)	0.468	0.781
56	(-0.774	0.886)	0.423	0.821
57	(-0.272	1.646)	0.489	0.761
58	(-0.578	1.265)	0.470	0.779
59	(-1.111	0.750)	0.474	0.775
60	(-1.491	0.212)	0.434	0.811
61	(-1.039	0.702)	0.444	0.803
62	(-2.889	-1.034)	0.473	0.776
63	(0.328	2.144)	0.463	0.785
64	(0.666	2.521)	0.473	0.776
65	(-0.813	0.845)	0.423	0.821
66	(-1.142	0.517)	0.423	0.821
67	(-0.816	1.059)	0.478	0.771
68	(-1.643	0.016)	0.423	0.821
69	(-0.446	1.191)	0.418	0.825
70	(-0.411	1.229)	0.418	0.825
71	(-0.894	0.866)	0.449	0.799
72	(-1.048	0.644)	0.432	0.814
73	(-0.682	0.961)	0.419	0.824
74	(0.748	2.596)	0.471	0.778
75	(-0.225	1.482)	0.436	0.810
76	(-1.346	0.324)	0.426	0.818

77	(-1.802 -0.200)	0.409	0.833
78	(-1.174 0.513)	0.430	0.815
79	(-1.285 0.459)	0.445	0.802
80	(-0.227 1.536)	0.450	0.798
81	(0.095 1.843)	0.446	0.801
82	(-1.736 -0.025)	0.437	0.809
83	(-3.459 -1.487)	0.503	0.747
84	(-0.275 1.450)	0.440	0.806
85	(-0.485 1.152)	0.418	0.826
86	(-1.214 0.462)	0.428	0.817
87	(-0.114 1.597)	0.436	0.810
88	(-1.088 0.692)	0.454	0.794
89	(-0.588 1.181)	0.451	0.796
90	(-0.400 1.344)	0.445	0.802
91	(0.158 1.930)	0.452	0.796
92	(-1.775 -0.106)	0.426	0.819
93	(-1.522 0.185)	0.436	0.810
94	(-0.644 1.034)	0.428	0.817
95	(-0.243 1.561)	0.460	0.788
96	(-0.420 1.362)	0.454	0.793
97	(-0.021 1.709)	0.441	0.805
98	(0.453 2.180)	0.441	0.806
99	(-1.059 0.736)	0.458	0.790
100	(-1.146 0.525)	0.426	0.818
101	(-1.497 0.208)	0.435	0.811
102	(-0.568 1.066)	0.417	0.826
103	(-0.486 1.251)	0.443	0.804
104	(-1.351 0.355)	0.435	0.810
105	(-0.980 0.765)	0.445	0.802
106	(-1.459 0.358)	0.464	0.785
107	(-1.439 0.169)	0.410	0.832
108	(0.735 2.591)	0.474	0.776
109	(-0.829 0.843)	0.427	0.818
110	(-1.709 -0.049)	0.424	0.821
111	(-0.677 0.977)	0.422	0.822
112	(-0.407 1.259)	0.425	0.819
113	(-1.117 0.661)	0.453	0.794
114	(-0.980 0.928)	0.487	0.763
115	(-1.250 0.431)	0.429	0.816
116	(-0.190 1.532)	0.439	0.807
117	(-0.624 1.009)	0.417	0.826
118	(-0.721 0.960)	0.429	0.816
119	(0.535 2.349)	0.463	0.786
120	(-1.271 0.342)	0.411	0.831
121	(-1.305 0.412)	0.438	0.808
122	(-0.944 0.783)	0.441	0.806
123	(-0.286 1.381)	0.425	0.819
124	(-0.027 1.730)	0.448	0.799
125	(-2.327 -0.385)	0.495	0.755
126	(-0.975 0.707)	0.429	0.816
127	(-0.365 1.461)	0.466	0.783
128	(-0.892 0.774)	0.425	0.819
129	(-0.220 1.450)	0.426	0.818
130	(-1.258 0.417)	0.427	0.817
131	(-1.002 0.726)	0.441	0.806
132	(-1.438 0.350)	0.456	0.792
133	(-1.446 0.184)	0.416	0.827
134	(-0.356 1.488)	0.470	0.779
135	(0.066 1.766)	0.434	0.812
136	(-0.213 1.455)	0.426	0.819
137	(-0.432 1.206)	0.418	0.825
138	(-1.286 0.431)	0.438	0.808
139	(-0.026 1.694)	0.439	0.807
140	(-1.840 -0.145)	0.433	0.813
141	(0.578 2.631)	0.524	0.726
142	(-1.529 0.162)	0.431	0.814
143	(-1.937 -0.175)	0.449	0.798
144	(0.128 1.877)	0.446	0.801
145	(-1.277 0.328)	0.409	0.833
146	(0.100 1.853)	0.447	0.800
147	(-0.243 1.444)	0.430	0.815
148	(-0.488 1.148)	0.418	0.826
149	(-0.096 1.623)	0.438	0.808
150	(-1.234 0.865)	0.535	0.713

151	(-0.949	0.747)	0.433	0.813
152	(0.314	2.350)	0.519	0.730
153	(0.463	2.340)	0.479	0.771
154	(0.357	2.175)	0.464	0.785
155	(-0.474	1.272)	0.445	0.802
156	(-0.441	1.279)	0.439	0.807
157	(0.438	2.314)	0.479	0.771
158	(-0.653	0.998)	0.421	0.823
159	(-0.016	1.708)	0.440	0.807
160	(0.189	1.904)	0.437	0.809
161	(0.288	2.038)	0.446	0.801
162	(-0.685	1.016)	0.434	0.812
163	(-1.112	0.509)	0.414	0.829
164	(-1.120	0.552)	0.427	0.818
165	(-0.252	1.408)	0.423	0.821
166	(-1.033	0.631)	0.424	0.820
167	(-0.850	0.971)	0.464	0.784
168	(-0.281	1.372)	0.422	0.822
169	(-0.679	1.130)	0.462	0.787
170	(-0.864	0.809)	0.427	0.818
171	(-0.704	1.039)	0.444	0.802
172	(-0.204	1.576)	0.454	0.794
173	(-1.002	0.767)	0.451	0.796
174	(-0.323	1.537)	0.474	0.775
175	(-1.463	0.135)	0.408	0.834
176	(0.574	2.335)	0.449	0.798
177	(-1.612	0.042)	0.422	0.822
178	(0.236	2.055)	0.464	0.785
179	(-0.220	1.592)	0.462	0.786
180	(-1.306	0.302)	0.410	0.832
181	(-1.769	-0.036)	0.442	0.805
182	(0.122	1.882)	0.449	0.799
183	(-0.591	1.291)	0.480	0.770
184	(-0.760	1.017)	0.453	0.794
185	(-1.079	0.581)	0.423	0.821
186	(-1.347	0.408)	0.448	0.800
187	(-1.139	0.541)	0.428	0.816
188	(-1.279	0.367)	0.420	0.824
189	(-0.274	1.616)	0.482	0.768
190	(0.225	1.987)	0.449	0.798
191	(0.110	1.953)	0.470	0.779
192	(-0.799	0.865)	0.424	0.820
193	(-2.919	-0.921)	0.510	0.740
194	(-0.778	0.879)	0.422	0.822
195	(0.072	2.134)	0.526	0.723
196	(-0.806	1.074)	0.480	0.770
197	(-0.710	0.962)	0.427	0.818
198	(-1.436	0.273)	0.436	0.810
199	(-1.480	0.729)	0.563	0.682
200	(-1.506	0.086)	0.406	0.835
201	(-1.524	0.385)	0.487	0.763
202	(-0.420	1.262)	0.429	0.816
203	(-1.132	0.597)	0.441	0.806
204	(1.068	3.216)	0.548	0.700
205	(-1.179	0.597)	0.453	0.795
206	(-0.626	1.007)	0.417	0.826
207	(-0.946	0.886)	0.467	0.782
208	(-0.113	1.641)	0.448	0.800
209	(-0.189	1.800)	0.507	0.743
210	(0.773	2.570)	0.458	0.790
211	(-0.619	1.301)	0.490	0.760
212	(0.102	1.996)	0.483	0.767
213	(-0.418	1.352)	0.451	0.796
214	(-1.471	0.126)	0.408	0.834
215	(-0.438	1.275)	0.437	0.809
216	(-1.399	0.274)	0.427	0.818
217	(-1.509	0.185)	0.432	0.813
218	(-0.722	1.017)	0.444	0.803
219	(-0.253	1.424)	0.428	0.817
220	(-2.256	-0.554)	0.434	0.811
221	(-0.435	1.381)	0.463	0.785
222	(0.091	1.780)	0.431	0.814
223	(0.055	1.802)	0.446	0.801
224	(-0.686	1.072)	0.449	0.799

225	(-0.693	0.954)	0.420	0.824
226	(0.136	1.897)	0.449	0.798
227	(-1.041	0.779)	0.464	0.785
228	(-0.379	1.300)	0.428	0.816
229	(-0.659	1.043)	0.434	0.811
230	(-0.980	0.668)	0.420	0.823
231	(1.379	3.430)	0.523	0.726
232	(-1.681	-0.107)	0.401	0.839
233	(0.042	1.746)	0.435	0.811
234	(-1.351	0.332)	0.429	0.816
235	(-1.101	0.579)	0.429	0.816
236	(-0.871	0.837)	0.436	0.810
237	(-1.695	-0.068)	0.415	0.828
238	(-1.506	0.211)	0.438	0.808
239	(-1.207	0.509)	0.438	0.808
240	(-0.270	1.489)	0.449	0.799
241	(-0.599	1.034)	0.417	0.826
242	(-0.412	1.270)	0.429	0.816
243	(-0.851	0.901)	0.447	0.800
244	(-1.374	0.267)	0.419	0.825
245	(-1.673	-0.098)	0.402	0.839
246	(0.329	2.129)	0.459	0.789
247	(-0.766	0.970)	0.443	0.804
248	(-1.282	0.326)	0.410	0.832
249	(-0.577	1.060)	0.418	0.826
250	(-0.228	1.443)	0.426	0.818
251	(-1.876	-0.075)	0.459	0.789
252	(-1.904	-0.161)	0.445	0.802
253	(0.650	2.592)	0.496	0.754
254	(-0.892	0.774)	0.425	0.819
255	(0.199	1.907)	0.436	0.810
256	(-0.454	1.207)	0.424	0.820
257	(-1.755	0.081)	0.468	0.781
258	(-0.444	1.373)	0.464	0.785
259	(-0.400	1.350)	0.446	0.801
260	(0.254	1.946)	0.432	0.814
261	(-1.569	0.060)	0.416	0.827
262	(-0.624	1.010)	0.417	0.826
263	(-1.425	0.184)	0.411	0.831
264	(-1.284	0.364)	0.420	0.823
265	(-0.090	1.622)	0.437	0.809
266	(-0.038	1.678)	0.438	0.808
267	(-1.069	0.592)	0.423	0.821
268	(-0.862	0.815)	0.428	0.817
269	(-1.180	0.546)	0.440	0.806
270	(-1.728	0.090)	0.464	0.785
271	(-0.700	1.081)	0.454	0.794
272	(0.191	1.896)	0.435	0.811
273	(-0.150	1.627)	0.453	0.795
274	(-0.947	0.706)	0.422	0.822
275	(-2.412	-0.668)	0.445	0.802
276	(-0.213	1.463)	0.427	0.817
277	(-1.573	0.258)	0.467	0.782
278	(-1.646	0.206)	0.472	0.777
279	(-0.253	1.417)	0.426	0.819
280	(-1.337	0.407)	0.445	0.802
281	(-0.619	1.014)	0.417	0.826
282	(-0.854	0.851)	0.435	0.811
283	(-0.862	0.824)	0.430	0.815
284	(-0.887	0.835)	0.439	0.807
285	(-2.045	-0.381)	0.425	0.820
286	(-0.075	1.793)	0.477	0.773
287	(-2.354	-0.489)	0.476	0.774
288	(-0.290	1.515)	0.460	0.788
289	(-1.180	0.567)	0.446	0.801
290	(0.230	1.951)	0.439	0.807
291	(-0.362	1.317)	0.428	0.816
292	(-1.334	0.365)	0.433	0.812
293	(-1.977	-0.337)	0.418	0.825
294	(-1.693	-0.016)	0.428	0.817
295	(0.683	2.524)	0.470	0.779
296	(1.616	3.816)	0.561	0.685
297	(-0.837	0.799)	0.417	0.826
298	(-0.428	1.412)	0.469	0.780

299	(-0.869	0.837)	0.435	0.811
300	(-1.827	0.068)	0.483	0.766
301	(0.050	1.837)	0.456	0.792
302	(0.560	2.377)	0.463	0.785
303	(-0.648	1.030)	0.428	0.817
304	(0.218	1.937)	0.439	0.808
305	(-0.446	1.268)	0.437	0.809
306	(-1.631	-0.009)	0.414	0.829
307	(0.424	2.291)	0.476	0.773
308	(-1.008	0.803)	0.462	0.787
309	(-0.756	1.008)	0.450	0.797
310	(-0.191	1.545)	0.443	0.804
311	(-0.666	1.102)	0.451	0.797
312	(-1.583	0.216)	0.459	0.789
313	(-0.111	1.591)	0.434	0.811
314	(-0.060	1.612)	0.427	0.818
315	(-0.677	0.977)	0.422	0.822
316	(-0.725	0.957)	0.429	0.816
317	(-0.062	1.662)	0.440	0.807
318	(0.168	1.880)	0.437	0.809
319	(-1.550	0.193)	0.445	0.802
320	(-1.279	0.556)	0.468	0.781
321	(-0.264	1.552)	0.463	0.785
322	(-1.804	-0.106)	0.433	0.812
323	(-0.311	1.518)	0.467	0.782
324	(-1.545	0.226)	0.452	0.796
325	(-0.363	1.437)	0.459	0.789
326	(-1.324	0.356)	0.429	0.816
327	(-0.038	1.678)	0.438	0.808
328	(-0.071	1.649)	0.439	0.808
329	(-1.788	-0.077)	0.436	0.810
330	(-0.889	1.140)	0.518	0.732
331	(0.901	2.798)	0.484	0.766
332	(-0.946	0.733)	0.428	0.817
333	(-1.036	0.658)	0.432	0.813
334	(-0.396	1.285)	0.429	0.816
335	(-0.325	1.462)	0.456	0.792
336	(0.169	1.973)	0.460	0.788
337	(-1.767	0.070)	0.469	0.780
338	(0.584	2.402)	0.464	0.785
339	(-1.779	0.295)	0.529	0.720
340	(-0.416	1.425)	0.470	0.780
341	(-0.632	1.005)	0.418	0.826
342	(-1.192	0.496)	0.431	0.814
343	(-0.706	1.062)	0.451	0.797
344	(-0.758	1.056)	0.463	0.786
345	(0.379	2.111)	0.442	0.805
346	(-0.479	1.208)	0.430	0.815
347	(-1.002	0.821)	0.465	0.784
348	(0.043	1.790)	0.446	0.801
349	(0.255	2.007)	0.447	0.800
350	(-1.495	0.098)	0.406	0.835
351	(-1.184	0.556)	0.444	0.803
352	(-0.023	1.767)	0.456	0.792
353	(-1.088	0.560)	0.421	0.823
354	(0.155	1.909)	0.448	0.800
355	(-0.740	1.002)	0.444	0.803
356	(-1.015	0.806)	0.464	0.784
357	(-0.387	1.481)	0.477	0.773
358	(-2.487	-0.816)	0.426	0.818
359	(-2.823	-1.092)	0.442	0.805
360	(-1.220	0.416)	0.417	0.826
361	(-1.370	0.301)	0.426	0.818
362	(-1.355	0.311)	0.425	0.819
363	(0.767	2.629)	0.475	0.774
364	(-0.339	1.523)	0.475	0.774
365	(-0.010	1.714)	0.440	0.807
366	(-2.251	-0.598)	0.422	0.822
367	(-1.017	0.832)	0.472	0.778
368	(-0.787	1.043)	0.467	0.782
369	(-0.989	0.703)	0.432	0.814
370	(-0.277	1.532)	0.461	0.787
371	(-1.174	0.712)	0.481	0.769
372	(-0.908	0.807)	0.437	0.809

373	(-0.258	1.449)	0.436	0.810
374	(-1.783	0.065)	0.471	0.778
375	(-0.037	1.674)	0.437	0.809
376	(0.767	2.629)	0.475	0.774
377	(1.311	3.389)	0.530	0.719
378	(-1.670	0.371)	0.521	0.729
379	(0.346	2.089)	0.445	0.802
380	(-0.451	1.187)	0.418	0.825
381	(-1.015	0.664)	0.428	0.816
382	(-1.281	0.611)	0.483	0.767
383	(-0.807	1.044)	0.472	0.777
384	(-0.969	1.037)	0.512	0.738
385	(0.521	2.264)	0.445	0.802
386	(-0.981	0.888)	0.477	0.773
387	(-0.427	1.211)	0.418	0.825
388	(0.092	1.806)	0.437	0.809
389	(-0.261	1.688)	0.497	0.753
390	(-0.823	0.837)	0.423	0.821
391	(-0.823	0.837)	0.423	0.821
392	(-0.129	1.689)	0.464	0.785
393	(0.094	1.835)	0.444	0.803
394	(-0.256	1.494)	0.446	0.801
395	(-0.208	1.585)	0.457	0.791
396	(-1.047	0.748)	0.458	0.790
397	(-1.001	0.662)	0.424	0.820
398	(-0.938	0.758)	0.432	0.813
399	(-2.161	-0.331)	0.467	0.782
400	(-0.086	1.626)	0.437	0.809
401	(0.047	1.786)	0.444	0.803
402	(0.055	2.036)	0.505	0.745
403	(-0.951	0.917)	0.477	0.773
404	(-1.373	0.356)	0.441	0.805
405	(-1.536	0.156)	0.432	0.814
406	(-1.686	0.076)	0.449	0.798
407	(-0.979	0.970)	0.497	0.753
408	(-1.402	0.213)	0.412	0.830
409	(0.524	2.449)	0.491	0.759
410	(0.947	2.852)	0.486	0.764
411	(-1.543	0.152)	0.433	0.813
412	(-0.545	1.465)	0.513	0.737
413	(-1.698	0.084)	0.455	0.793
414	(-1.750	-0.070)	0.429	0.816
415	(0.474	2.292)	0.464	0.785
416	(-0.554	1.357)	0.488	0.762
417	(0.106	1.891)	0.455	0.793
418	(-0.982	0.745)	0.440	0.806
419	(-1.661	0.061)	0.439	0.807
420	(-0.795	1.096)	0.482	0.767
421	(-0.431	1.208)	0.418	0.825
422	(-2.053	-0.313)	0.444	0.803
423	(-0.667	1.068)	0.443	0.804
424	(-2.603	-0.912)	0.431	0.814
425	(-0.830	1.010)	0.469	0.780
426	(-2.146	-0.490)	0.422	0.822
427	(0.772	2.567)	0.458	0.790
428	(-1.303	0.313)	0.412	0.830
429	(-3.470	-1.567)	0.485	0.764
430	(-1.128	0.576)	0.435	0.811
431	(-2.666	-0.896)	0.452	0.796
432	(0.002	1.719)	0.438	0.808
433	(1.229	3.304)	0.529	0.720
434	(-0.455	1.519)	0.504	0.746
435	(-3.036	-1.165)	0.477	0.772
436	(-1.579	0.184)	0.450	0.798
437	(0.013	1.797)	0.455	0.793
438	(-1.813	0.046)	0.474	0.775
439	(-2.374	-0.672)	0.434	0.811
440	(-0.576	1.291)	0.476	0.773
441	(-0.161	1.804)	0.501	0.749
442	(-0.470	1.167)	0.418	0.826
443	(-0.419	1.481)	0.485	0.765
444	(-0.431	1.550)	0.505	0.745
445	(-0.274	1.456)	0.442	0.805
446	(-0.312	1.397)	0.436	0.810

447	(-1.369	0.393)	0.450	0.798
448	(-1.103	0.593)	0.433	0.813
449	(-1.189	0.947)	0.545	0.703
450	(-0.341	1.461)	0.460	0.789
451	(0.361	2.106)	0.445	0.802
452	(-1.080	0.589)	0.426	0.819
453	(-2.456	-0.784)	0.427	0.818
454	(-0.047	1.839)	0.481	0.769
455	(-1.569	0.238)	0.461	0.787
456	(-1.361	0.397)	0.448	0.799
457	(-1.084	0.694)	0.454	0.794
458	(-1.423	0.282)	0.435	0.811
459	(-0.994	1.071)	0.527	0.723
460	(-1.064	0.594)	0.423	0.821
461	(-0.681	0.995)	0.428	0.817
462	(0.111	1.811)	0.434	0.812
463	(-0.807	0.853)	0.424	0.821
464	(-1.806	-0.207)	0.408	0.834
465	(-0.464	1.396)	0.474	0.775
466	(-1.109	0.676)	0.455	0.793
467	(-1.038	0.620)	0.423	0.821
468	(0.931	2.741)	0.462	0.787
469	(-0.484	1.382)	0.476	0.774
470	(-0.500	1.455)	0.499	0.751
471	(-0.058	1.802)	0.475	0.775
472	(-0.816	0.991)	0.461	0.787
473	(-1.186	0.518)	0.435	0.811
474	(0.541	2.358)	0.463	0.785
475	(-1.289	0.313)	0.409	0.833
476	(-1.603	0.196)	0.459	0.789
477	(-1.302	0.420)	0.439	0.807
478	(-1.170	0.534)	0.435	0.811
479	(-1.380	0.317)	0.433	0.813
480	(0.943	2.971)	0.517	0.732
481	(-2.367	-0.655)	0.437	0.809
482	(0.276	2.046)	0.451	0.796
483	(1.131	3.089)	0.499	0.751
484	(-2.396	-0.538)	0.474	0.775
485	(-0.909	0.923)	0.467	0.782
486	(-1.998	-0.125)	0.478	0.772
487	(0.297	2.025)	0.441	0.806
488	(-3.132	-1.351)	0.454	0.794
489	(-2.367	-0.522)	0.470	0.779
490	(-0.236	1.437)	0.427	0.818
491	(0.808	2.612)	0.460	0.788
492	(-1.484	0.211)	0.432	0.813
493	(-1.263	0.479)	0.444	0.802
494	(-1.095	0.638)	0.442	0.805
495	(-1.522	0.208)	0.441	0.805
496	(-0.868	0.976)	0.471	0.779
497	(-1.840	-0.163)	0.428	0.817
498	(0.700	2.465)	0.450	0.797
499	(-0.548	1.220)	0.451	0.797
500	(-0.302	1.413)	0.438	0.809

PRECISION OF FACTOR SCORES

FACTOR: 2

Case	Approximate 95% confidence interval		Posterior SE	Reliability
1	(-0.186	2.179)	0.603	0.636
2	(-0.105	2.334)	0.622	0.613
3	(-1.490	0.567)	0.525	0.725
4	(-2.038	0.111)	0.548	0.700
5	(-2.113	-0.069)	0.521	0.728
6	(-1.206	0.811)	0.514	0.735
7	(-0.977	1.145)	0.541	0.707
8	(-0.424	1.889)	0.590	0.652
9	(-0.084	2.306)	0.610	0.628
10	(-0.977	1.147)	0.542	0.707
11	(-0.110	2.428)	0.648	0.581

12	(-0.379	2.003)	0.608	0.631
13	(-0.051	2.418)	0.630	0.603
14	(-0.830	1.323)	0.549	0.698
15	(-0.566	1.800)	0.604	0.636
16	(-1.239	1.058)	0.586	0.657
17	(-0.957	1.147)	0.537	0.712
18	(-1.451	0.580)	0.518	0.732
19	(-0.654	1.602)	0.576	0.669
20	(-0.992	1.261)	0.575	0.670
21	(-2.878	-0.347)	0.646	0.583
22	(-1.426	0.566)	0.508	0.742
23	(-1.083	1.078)	0.551	0.696
24	(0.111	2.686)	0.657	0.568
25	(-1.650	0.655)	0.588	0.654
26	(-1.486	0.493)	0.505	0.745
27	(0.257	2.961)	0.690	0.524
28	(-1.907	0.162)	0.528	0.721
29	(-1.245	0.784)	0.518	0.732
30	(-0.491	1.798)	0.584	0.659
31	(-1.220	0.869)	0.533	0.716
32	(-1.487	0.493)	0.505	0.745
33	(-2.362	-0.160)	0.562	0.684
34	(-1.493	0.600)	0.534	0.715
35	(-1.815	0.275)	0.533	0.716
36	(0.003	2.483)	0.632	0.600
37	(-1.493	0.484)	0.505	0.745
38	(-0.389	1.937)	0.593	0.648
39	(-0.393	1.924)	0.591	0.650
40	(-0.044	2.418)	0.628	0.605
41	(-1.261	0.883)	0.547	0.701
42	(-0.422	1.947)	0.604	0.635
43	(-0.996	1.095)	0.533	0.715
44	(0.242	2.923)	0.684	0.532
45	(-1.621	0.429)	0.523	0.726
46	(-0.606	1.590)	0.560	0.686
47	(-1.386	0.708)	0.534	0.715
48	(-0.664	1.667)	0.594	0.647
49	(-0.754	1.515)	0.579	0.665
50	(-0.787	1.377)	0.552	0.695
51	(-0.395	2.042)	0.621	0.614
52	(-1.927	0.107)	0.519	0.731
53	(-1.433	0.558)	0.508	0.742
54	(-1.638	0.381)	0.515	0.735
55	(-0.843	1.296)	0.546	0.702
56	(-0.678	1.514)	0.559	0.687
57	(-2.083	0.236)	0.592	0.650
58	(-2.853	-0.743)	0.538	0.710
59	(-1.132	0.948)	0.531	0.718
60	(-0.407	1.869)	0.581	0.663
61	(-2.384	-0.160)	0.567	0.678
62	(-0.830	1.278)	0.538	0.711
63	(-0.500	1.808)	0.589	0.653
64	(0.357	3.085)	0.696	0.516
65	(-0.832	1.352)	0.557	0.690
66	(-0.681	1.476)	0.550	0.697
67	(-0.519	1.762)	0.582	0.661
68	(-0.417	1.802)	0.566	0.679
69	(-0.648	1.546)	0.560	0.687
70	(0.322	3.031)	0.691	0.523
71	(0.106	2.732)	0.670	0.551
72	(-2.171	-0.065)	0.537	0.711
73	(-2.264	-0.192)	0.529	0.720
74	(-1.505	0.487)	0.508	0.742
75	(0.302	3.003)	0.689	0.525
76	(-0.214	2.156)	0.605	0.634
77	(-1.518	0.579)	0.535	0.714
78	(-0.700	1.492)	0.559	0.687
79	(-0.943	1.625)	0.655	0.571
80	(-0.208	2.137)	0.598	0.642
81	(-1.896	0.216)	0.539	0.710
82	(0.140	2.690)	0.650	0.577
83	(-1.478	0.694)	0.554	0.693
84	(-0.871	1.231)	0.536	0.712
85	(-1.526	0.529)	0.524	0.725

86	(-1.049	1.017)	0.527	0.722
87	(-1.612	0.385)	0.509	0.740
88	(-0.803	1.468)	0.579	0.665
89	(-0.859	1.307)	0.553	0.695
90	(-1.737	0.633)	0.605	0.634
91	(-0.013	2.658)	0.681	0.536
92	(-0.005	2.477)	0.633	0.599
93	(-1.123	1.372)	0.636	0.595
94	(-0.570	1.618)	0.558	0.688
95	(0.204	2.876)	0.682	0.535
96	(-1.179	0.907)	0.532	0.717
97	(0.068	2.625)	0.652	0.574
98	(-0.309	2.159)	0.630	0.604
99	(-1.805	0.445)	0.574	0.671
100	(-1.891	0.219)	0.538	0.710
101	(-0.637	1.609)	0.573	0.672
102	(-0.326	2.324)	0.676	0.543
103	(-0.632	1.589)	0.567	0.679
104	(0.140	2.683)	0.649	0.579
105	(-0.564	1.746)	0.589	0.653
106	(-1.043	1.182)	0.568	0.678
107	(-0.498	1.696)	0.560	0.687
108	(-0.920	1.309)	0.569	0.677
109	(-1.552	0.516)	0.527	0.722
110	(-1.520	0.742)	0.577	0.667
111	(-0.813	1.357)	0.553	0.694
112	(0.115	2.688)	0.657	0.569
113	(-1.546	0.535)	0.531	0.718
114	(-0.471	1.754)	0.568	0.678
115	(-2.276	0.034)	0.589	0.653
116	(-0.590	1.685)	0.580	0.663
117	(-0.585	1.645)	0.569	0.676
118	(-0.543	1.653)	0.560	0.686
119	(-0.323	2.019)	0.597	0.643
120	(-1.081	1.000)	0.531	0.718
121	(-0.778	1.518)	0.586	0.657
122	(-2.154	-0.066)	0.533	0.716
123	(-1.640	0.354)	0.509	0.741
124	(-0.110	2.270)	0.607	0.632
125	(-0.899	1.412)	0.590	0.652
126	(-0.767	1.462)	0.569	0.677
127	(-2.416	-0.397)	0.515	0.735
128	(-1.537	0.439)	0.504	0.746
129	(-0.742	1.426)	0.553	0.694
130	(-1.872	0.171)	0.521	0.728
131	(-1.759	0.257)	0.514	0.736
132	(-1.077	1.004)	0.531	0.718
133	(-1.453	0.606)	0.525	0.724
134	(-0.424	2.145)	0.655	0.571
135	(-0.492	1.796)	0.584	0.659
136	(-1.279	1.105)	0.608	0.630
137	(-1.246	1.038)	0.583	0.661
138	(-1.016	1.213)	0.569	0.677
139	(-1.295	0.728)	0.516	0.733
140	(-0.463	1.744)	0.563	0.683
141	(-1.364	0.977)	0.597	0.644
142	(-1.206	0.862)	0.528	0.722
143	(-1.258	0.932)	0.559	0.688
144	(-1.206	0.830)	0.520	0.730
145	(-1.843	0.243)	0.532	0.717
146	(-0.834	1.274)	0.538	0.711
147	(-1.656	0.338)	0.509	0.741
148	(-1.082	1.029)	0.538	0.710
149	(-1.081	1.036)	0.540	0.708
150	(-1.976	0.490)	0.629	0.604
151	(-0.008	2.523)	0.645	0.583
152	(-1.105	1.174)	0.581	0.662
153	(-0.818	1.322)	0.546	0.702
154	(-0.544	1.763)	0.588	0.654
155	(-0.508	1.684)	0.559	0.687
156	(-0.486	1.712)	0.561	0.685
157	(-0.270	2.090)	0.602	0.638
158	(-1.399	0.689)	0.533	0.716
159	(-0.604	1.701)	0.588	0.654

160	(-0.577	1.646)	0.567	0.678
161	(-0.529	1.808)	0.596	0.645
162	(-1.126	0.981)	0.537	0.711
163	(-1.802	0.188)	0.508	0.742
164	(-0.900	1.372)	0.580	0.664
165	(-0.318	2.016)	0.595	0.646
166	(-1.088	1.155)	0.572	0.673
167	(-0.458	2.028)	0.634	0.598
168	(-1.759	0.234)	0.509	0.741
169	(-1.445	0.645)	0.533	0.716
170	(-0.676	1.512)	0.558	0.688
171	(-0.104	2.436)	0.648	0.580
172	(-2.602	-0.422)	0.556	0.690
173	(0.286	2.991)	0.690	0.524
174	(-2.285	-0.214)	0.528	0.721
175	(-1.088	1.122)	0.564	0.682
176	(-1.490	0.581)	0.529	0.721
177	(-0.616	1.634)	0.574	0.671
178	(-1.224	0.873)	0.535	0.714
179	(-1.693	0.466)	0.551	0.697
180	(-1.151	0.945)	0.535	0.714
181	(-1.028	1.245)	0.580	0.664
182	(-0.216	2.126)	0.597	0.643
183	(-0.909	1.265)	0.555	0.692
184	(-0.573	1.905)	0.632	0.600
185	(-1.402	0.696)	0.535	0.714
186	(-1.237	0.855)	0.534	0.715
187	(-0.536	1.801)	0.596	0.645
188	(-2.297	-0.241)	0.524	0.725
189	(-0.580	1.661)	0.572	0.673
190	(-2.522	-0.157)	0.603	0.636
191	(-1.114	1.205)	0.592	0.650
192	(-0.326	2.064)	0.610	0.628
193	(-0.446	1.924)	0.604	0.635
194	(-0.099	2.284)	0.608	0.631
195	(-0.502	2.035)	0.647	0.581
196	(-1.704	0.409)	0.539	0.709
197	(-1.099	1.196)	0.585	0.657
198	(-1.513	0.784)	0.586	0.657
199	(-0.599	1.819)	0.617	0.619
200	(-1.337	0.665)	0.511	0.739
201	(-0.035	2.380)	0.616	0.620
202	(-0.368	1.996)	0.603	0.637
203	(-1.094	1.016)	0.538	0.710
204	(-0.596	1.671)	0.578	0.666
205	(-0.653	1.600)	0.575	0.670
206	(-1.174	0.851)	0.517	0.733
207	(-0.396	2.017)	0.616	0.621
208	(-0.158	2.268)	0.619	0.617
209	(-0.229	2.177)	0.614	0.623
210	(-0.620	1.602)	0.567	0.679
211	(-0.040	2.372)	0.615	0.621
212	(-1.270	0.760)	0.518	0.732
213	(-0.804	1.542)	0.598	0.642
214	(-1.901	0.161)	0.526	0.723
215	(-0.701	1.521)	0.567	0.679
216	(-1.466	0.513)	0.505	0.745
217	(-1.321	0.977)	0.586	0.656
218	(-1.456	0.537)	0.508	0.742
219	(-0.066	2.489)	0.652	0.575
220	(-2.136	0.035)	0.554	0.693
221	(-0.423	1.939)	0.603	0.637
222	(-1.874	0.231)	0.537	0.712
223	(-0.655	1.634)	0.584	0.659
224	(-0.582	1.646)	0.569	0.677
225	(-1.547	0.428)	0.504	0.746
226	(-1.104	1.014)	0.540	0.708
227	(-1.009	1.167)	0.555	0.692
228	(-1.530	0.448)	0.504	0.746
229	(-1.171	0.988)	0.551	0.697
230	(-1.707	0.465)	0.554	0.693
231	(-1.407	0.907)	0.590	0.652
232	(-1.298	0.704)	0.511	0.739
233	(-1.283	0.948)	0.569	0.676

234	(0.006	2.434)	0.619	0.616
235	(-1.022	1.039)	0.526	0.724
236	(0.230	2.848)	0.668	0.554
237	(-2.101	-0.064)	0.519	0.730
238	(0.032	2.574)	0.648	0.579
239	(-1.439	0.623)	0.526	0.723
240	(-1.729	0.622)	0.600	0.640
241	(-0.624	1.575)	0.561	0.685
242	(-0.283	2.063)	0.599	0.642
243	(-1.119	0.934)	0.524	0.726
244	(-0.836	1.323)	0.551	0.697
245	(-1.510	0.463)	0.503	0.747
246	(0.485	3.248)	0.705	0.503
247	(-1.564	0.494)	0.525	0.724
248	(-1.423	0.614)	0.520	0.730
249	(-1.471	0.741)	0.564	0.681
250	(-0.490	1.707)	0.560	0.686
251	(-1.302	0.750)	0.524	0.726
252	(-1.084	1.087)	0.554	0.693
253	(-0.745	1.456)	0.561	0.685
254	(-1.537	0.439)	0.504	0.746
255	(-1.117	1.016)	0.544	0.704
256	(-1.320	0.693)	0.514	0.736
257	(-1.218	1.084)	0.587	0.655
258	(-0.910	1.261)	0.554	0.693
259	(-1.174	0.953)	0.543	0.706
260	(-1.023	1.045)	0.527	0.722
261	(-2.522	-0.485)	0.520	0.730
262	(-1.098	0.985)	0.531	0.718
263	(-0.652	1.756)	0.614	0.623
264	(0.133	2.711)	0.658	0.568
265	(-1.563	0.746)	0.589	0.653
266	(-0.334	1.995)	0.594	0.647
267	(-1.299	0.781)	0.531	0.719
268	(-0.305	2.032)	0.596	0.645
269	(-1.028	1.032)	0.526	0.724
270	(-1.170	0.926)	0.535	0.714
271	(-0.110	2.430)	0.648	0.580
272	(-1.492	0.496)	0.507	0.743
273	(-0.355	2.037)	0.610	0.628
274	(-1.554	0.527)	0.531	0.718
275	(-1.444	0.602)	0.522	0.727
276	(-0.034	2.430)	0.629	0.605
277	(-0.502	1.789)	0.585	0.658
278	(-2.451	-0.444)	0.512	0.738
279	(-1.060	1.082)	0.546	0.701
280	(-1.640	0.435)	0.530	0.720
281	(-0.574	1.774)	0.599	0.641
282	(-1.066	1.075)	0.546	0.702
283	(-0.585	1.600)	0.557	0.689
284	(-1.432	0.561)	0.508	0.741
285	(-1.229	0.891)	0.541	0.707
286	(-1.421	0.686)	0.537	0.711
287	(0.023	2.574)	0.651	0.577
288	(-1.351	0.730)	0.531	0.718
289	(-0.014	2.468)	0.633	0.599
290	(-0.224	2.234)	0.627	0.607
291	(-1.044	1.016)	0.526	0.724
292	(-1.472	0.789)	0.577	0.667
293	(0.199	2.800)	0.663	0.560
294	(-1.840	0.239)	0.530	0.719
295	(-1.535	0.686)	0.566	0.679
296	(-0.515	1.689)	0.562	0.684
297	(-1.210	0.812)	0.516	0.734
298	(-0.784	1.597)	0.607	0.631
299	(-0.507	1.843)	0.599	0.641
300	(-0.026	2.552)	0.658	0.568
301	(0.292	2.997)	0.690	0.524
302	(-1.306	1.070)	0.606	0.633
303	(-0.637	1.560)	0.560	0.686
304	(-0.237	2.096)	0.595	0.646
305	(-1.114	1.054)	0.553	0.694
306	(-1.566	0.540)	0.537	0.711
307	(-2.823	-0.725)	0.535	0.713

308	(-0.608	1.613)	0.567	0.679
309	(-0.470	1.891)	0.602	0.637
310	(0.278	2.972)	0.687	0.527
311	(0.191	2.794)	0.664	0.559
312	(-0.998	1.254)	0.574	0.670
313	(-0.070	2.326)	0.611	0.626
314	(-0.945	1.245)	0.559	0.688
315	(-0.909	1.264)	0.554	0.693
316	(-1.284	0.946)	0.569	0.676
317	(-0.873	1.380)	0.575	0.670
318	(-0.922	1.325)	0.573	0.671
319	(0.438	3.198)	0.704	0.504
320	(-1.395	0.812)	0.563	0.683
321	(-0.505	1.841)	0.598	0.642
322	(-1.895	0.475)	0.605	0.634
323	(0.077	2.589)	0.641	0.589
324	(-2.590	-0.560)	0.518	0.732
325	(-1.125	0.983)	0.538	0.711
326	(-2.415	-0.407)	0.512	0.738
327	(-0.334	1.995)	0.594	0.647
328	(-1.406	0.588)	0.509	0.741
329	(-0.047	2.363)	0.615	0.622
330	(0.560	3.365)	0.715	0.488
331	(-1.094	1.038)	0.544	0.704
332	(-1.343	0.914)	0.576	0.669
333	(-1.278	0.838)	0.540	0.709
334	(-0.466	1.738)	0.562	0.684
335	(-0.695	1.578)	0.580	0.664
336	(-0.410	2.154)	0.654	0.572
337	(0.221	2.900)	0.683	0.533
338	(0.435	3.184)	0.701	0.508
339	(-0.014	2.526)	0.648	0.580
340	(-0.758	1.462)	0.566	0.679
341	(-2.258	0.038)	0.586	0.657
342	(-2.504	-0.398)	0.537	0.711
343	(-1.270	0.787)	0.525	0.725
344	(-0.126	2.250)	0.606	0.633
345	(-1.035	1.173)	0.563	0.683
346	(-1.080	1.001)	0.531	0.718
347	(-0.521	1.933)	0.626	0.608
348	(-0.710	1.519)	0.569	0.677
349	(-1.283	0.819)	0.536	0.713
350	(-1.804	0.437)	0.572	0.673
351	(-1.046	1.246)	0.585	0.658
352	(-1.201	0.899)	0.536	0.713
353	(-0.803	1.305)	0.538	0.711
354	(-0.679	1.557)	0.570	0.675
355	(-1.226	0.876)	0.536	0.713
356	(-0.687	1.508)	0.560	0.687
357	(-2.046	0.173)	0.566	0.680
358	(-1.319	0.889)	0.563	0.683
359	(-0.454	1.847)	0.587	0.655
360	(0.020	2.601)	0.658	0.566
361	(-0.876	1.307)	0.557	0.690
362	(-0.081	2.310)	0.610	0.628
363	(0.263	2.957)	0.687	0.528
364	(0.042	2.544)	0.638	0.593
365	(-0.592	1.667)	0.576	0.668
366	(-1.051	1.050)	0.536	0.713
367	(-1.058	1.238)	0.586	0.657
368	(-1.803	0.360)	0.552	0.696
369	(-0.524	1.788)	0.590	0.652
370	(-0.390	1.968)	0.602	0.638
371	(-2.132	0.350)	0.633	0.599
372	(-1.406	0.700)	0.537	0.711
373	(-1.482	0.582)	0.526	0.723
374	(-0.401	1.869)	0.579	0.665
375	(-1.662	0.467)	0.543	0.705
376	(0.263	2.957)	0.687	0.528
377	(-0.683	1.603)	0.583	0.660
378	(-2.708	-0.686)	0.516	0.734
379	(-0.395	1.916)	0.590	0.652
380	(-0.666	1.535)	0.562	0.685
381	(-1.084	0.974)	0.525	0.724

382	(-0.315	2.019)	0.596	0.645
383	(0.255	2.952)	0.688	0.526
384	(-1.596	0.441)	0.520	0.730
385	(0.197	2.805)	0.665	0.557
386	(-0.517	1.801)	0.591	0.650
387	(-0.458	1.748)	0.563	0.683
388	(0.008	2.545)	0.647	0.581
389	(-0.232	2.191)	0.618	0.618
390	(-1.312	0.829)	0.546	0.702
391	(-1.312	0.829)	0.546	0.702
392	(-0.445	1.861)	0.588	0.654
393	(0.085	2.597)	0.641	0.590
394	(-1.516	0.623)	0.546	0.702
395	(-1.711	0.651)	0.603	0.637
396	(-1.568	0.429)	0.509	0.740
397	(0.168	2.759)	0.661	0.563
398	(0.048	2.646)	0.663	0.561
399	(-0.297	2.345)	0.674	0.546
400	(-1.685	0.384)	0.528	0.721
401	(-0.307	2.169)	0.631	0.601
402	(-0.383	2.084)	0.629	0.604
403	(-1.135	0.976)	0.539	0.710
404	(0.005	2.434)	0.620	0.616
405	(-1.898	0.182)	0.530	0.719
406	(-1.426	0.645)	0.528	0.721
407	(-1.273	0.819)	0.534	0.715
408	(-0.030	2.537)	0.655	0.571
409	(-0.328	2.044)	0.605	0.634
410	(-1.246	0.787)	0.519	0.731
411	(0.073	2.628)	0.652	0.575
412	(-0.019	2.467)	0.634	0.598
413	(0.577	3.380)	0.715	0.489
414	(-0.541	1.678)	0.566	0.680
415	(-1.445	0.574)	0.515	0.735
416	(0.394	3.084)	0.686	0.529
417	(-1.569	0.960)	0.645	0.584
418	(-0.741	1.591)	0.595	0.646
419	(-1.392	0.680)	0.529	0.721
420	(-0.417	1.858)	0.580	0.663
421	(-0.542	1.729)	0.579	0.664
422	(-1.119	1.018)	0.545	0.703
423	(-1.673	0.598)	0.579	0.665
424	(-0.893	1.381)	0.580	0.663
425	(-1.659	0.376)	0.519	0.730
426	(-0.060	2.341)	0.613	0.625
427	(-0.713	1.520)	0.570	0.676
428	(-0.840	1.514)	0.600	0.640
429	(-2.577	-0.544)	0.519	0.731
430	(-0.197	2.353)	0.650	0.577
431	(-1.069	1.185)	0.575	0.669
432	(-0.357	2.091)	0.624	0.610
433	(-0.071	2.513)	0.659	0.565
434	(-0.711	1.593)	0.588	0.655
435	(-1.341	0.864)	0.563	0.683
436	(-1.270	0.976)	0.573	0.672
437	(0.402	3.142)	0.699	0.511
438	(-1.194	1.021)	0.565	0.681
439	(-1.636	0.508)	0.547	0.701
440	(0.211	2.889)	0.683	0.533
441	(-1.619	0.672)	0.584	0.659
442	(-1.101	1.069)	0.554	0.694
443	(-0.762	1.503)	0.578	0.666
444	(-0.049	2.424)	0.631	0.602
445	(-1.904	0.195)	0.535	0.713
446	(-2.514	-0.437)	0.530	0.719
447	(-1.509	0.582)	0.533	0.716
448	(-1.353	0.906)	0.576	0.668
449	(-1.615	0.429)	0.521	0.728
450	(-1.209	0.817)	0.517	0.733
451	(-0.261	2.065)	0.593	0.648
452	(-0.967	1.304)	0.579	0.665
453	(-1.644	0.410)	0.524	0.725
454	(-0.843	1.308)	0.549	0.699
455	(-2.377	-0.301)	0.530	0.719

456	(-1.960	0.242)	0.562	0.684
457	(-0.984	1.254)	0.571	0.674
458	(-1.143	0.958)	0.536	0.713
459	(-0.492	1.969)	0.628	0.606
460	(-1.791	0.384)	0.555	0.692
461	(-1.307	0.774)	0.531	0.718
462	(-0.753	1.504)	0.576	0.668
463	(-1.232	1.037)	0.579	0.665
464	(-1.232	0.799)	0.518	0.732
465	(0.597	3.401)	0.715	0.488
466	(-1.527	0.449)	0.504	0.746
467	(-0.936	1.187)	0.542	0.707
468	(-1.646	0.651)	0.586	0.656
469	(-0.734	1.715)	0.625	0.610
470	(-1.058	1.381)	0.622	0.613
471	(-1.340	0.685)	0.517	0.733
472	(-1.106	1.099)	0.562	0.684
473	(-0.328	2.016)	0.598	0.642
474	(-0.387	1.843)	0.569	0.676
475	(-1.879	0.219)	0.535	0.714
476	(-1.108	1.181)	0.584	0.659
477	(-1.517	0.511)	0.517	0.732
478	(-1.304	0.785)	0.533	0.716
479	(-0.916	1.278)	0.560	0.687
480	(0.358	3.089)	0.697	0.514
481	(-2.612	-0.263)	0.599	0.641
482	(-1.548	0.455)	0.511	0.739
483	(-0.052	2.535)	0.660	0.565
484	(-1.755	0.403)	0.551	0.697
485	(-1.103	1.153)	0.576	0.669
486	(-1.627	0.404)	0.518	0.732
487	(-1.306	0.833)	0.546	0.702
488	(-0.085	2.315)	0.612	0.625
489	(-1.943	0.090)	0.518	0.731
490	(-0.293	2.081)	0.606	0.633
491	(-0.539	1.901)	0.622	0.613
492	(-1.622	0.404)	0.517	0.733
493	(-1.055	1.080)	0.545	0.703
494	(-1.041	1.108)	0.548	0.699
495	(0.167	2.725)	0.653	0.574
496	(-2.609	-0.435)	0.554	0.693
497	(-0.660	1.543)	0.562	0.684
498	(-0.929	1.489)	0.617	0.619
499	(-0.845	1.618)	0.628	0.605
500	(-1.410	0.603)	0.513	0.736

PERSON-FIT INDICES
Ferrando (2009)

Please note that Ferrando's Person-Fit Indices can be only safely interpreted for continuous variables

Summary Statistics for Person Fit Indices

Smallest = -3.2999
Largest = 5.3349

Cases with large Person-Fit Indices (Absolute value larger than 2.99)

Case	Lc
19	3.380
20	3.271
141	3.790
150	4.729
195	4.657
199	4.000
231	4.576

240	3.877
322	5.335
367	3.018
371	3.756
417	3.748
418	5.060
434	3.467
441	4.594
459	4.557
460	4.011
470	3.702
488	-3.300

Person-Fit Indices for individuals

Case	Lc
1	-1.493
2	0.059
3	-1.094
4	0.846
5	-0.541
6	-1.726
7	-0.922
8	-1.016
9	-0.880
10	-0.920
11	0.934
12	0.156
13	-1.052
14	-1.887
15	-0.808
16	0.911
17	1.254
18	1.972
19**	3.380
20**	3.271
21	2.413
22	-1.885
23	0.749
24	-1.637
25	0.718
26	-0.096
27	-0.130
28	-1.010
29	-0.972
30	-0.065
31	0.001
32	-0.725
33	1.374
34	1.773
35	-0.255
36	-2.578
37	-1.561
38	-0.042
39	-0.141
40	-1.959
41	-0.730
42	-1.367
43	-0.982
44	-1.291
45	-1.344
46	-1.085
47	-0.636
48	0.399
49	2.398
50	-0.392
51	-0.245
52	-1.557
53	0.006
54	-0.149
55	-0.234
56	-1.594

57	2.869
58	1.269
59	0.633
60	-0.714
61	2.439
62	2.109
63	-0.415
64	-0.954
65	-0.504
66	-0.868
67	0.878
68	-1.553
69	-1.226
70	-2.318
71	-0.535
72	-0.638
73	-0.408
74	-1.196
75	-1.958
76	-0.754
77	0.278
78	-0.251
79	2.397
80	-1.502
81	-0.015
82	-1.091
83	0.816
84	-0.696
85	-1.844
86	-0.313
87	-1.076
88	1.201
89	-0.005
90	1.633
91	0.679
92	-1.517
93	2.260
94	-1.247
95	-0.821
96	0.571
97	-1.458
98	-0.648
99	1.421
100	0.280
101	2.343
102	0.907
103	-0.807
104	-1.355
105	0.109
106	1.502
107	-2.110
108	-0.101
109	-0.087
110	1.756
111	-1.271
112	-1.836
113	0.709
114	0.898
115	2.127
116	-0.434
117	-1.693
118	-0.763
119	-0.431
120	-0.496
121	0.177
122	0.056
123	-1.900
124	-1.118
125	2.457
126	-0.390
127	0.584
128	-1.897
129	-1.511
130	-1.116

131	-0.730
132	0.991
133	-1.230
134	1.855
135	-0.746
136	2.063
137	-0.240
138	1.714
139	-1.589
140	-0.555
141**	3.790
142	0.207
143	0.808
144	-0.659
145	-1.188
146	-0.880
147	-1.586
148	-1.332
149	-0.681
150**	4.729
151	-0.965
152	2.686
153	1.329
154	-0.376
155	-1.321
156	-1.599
157	-0.398
158	-0.208
159	-1.077
160	-1.368
161	-0.876
162	-0.529
163	-2.320
164	0.273
165	-2.256
166	0.053
167	1.438
168	-1.842
169	0.658
170	-1.215
171	-0.864
172	0.619
173	-0.028
174	0.405
175	-0.905
176	-0.877
177	-0.339
178	-0.537
179	0.657
180	-1.365
181	0.765
182	-1.634
183	0.794
184	1.916
185	-0.750
186	1.004
187	-1.070
188	-0.360
189	0.929
190	1.682
191	1.026
192	-0.360
193	2.250
194	-1.420
195**	4.657
196	1.691
197	0.747
198	1.470
199**	4.000
200	-2.124
201	0.930
202	-1.041
203	0.081
204	0.045

205	0.256
206	-1.664
207	0.368
208	-1.095
209	0.881
210	-1.557
211	0.084
212	0.332
213	0.563
214	-1.445
215	0.825
216	-1.363
217	1.503
218	-0.724
219	-1.805
220	1.702
221	-0.481
222	-0.706
223	-0.496
224	-0.149
225	-2.058
226	-0.674
227	1.038
228	-1.668
229	-0.172
230	1.364
231**	4.576
232	-2.026
233	0.508
234	-1.720
235	-1.183
236	-0.556
237	-1.146
238	-0.665
239	-0.474
240**	3.877
241	-1.621
242	-1.784
243	-0.426
244	-1.014
245	-2.292
246	-0.723
247	-0.410
248	-1.323
249	-0.220
250	-1.929
251	0.387
252	0.358
253	-0.126
254	-2.126
255	-1.148
256	-1.446
257	2.024
258	0.039
259	0.395
260	-0.800
261	-1.091
262	-1.077
263	0.734
264	-1.181
265	0.307
266	-1.966
267	-1.078
268	-1.731
269	0.359
270	1.581
271	0.453
272	-1.884
273	-0.282
274	-0.703
275	-0.085
276	-1.881
277	1.491
278	0.503

279	-0.942
280	0.274
281	-0.911
282	-0.415
283	-0.805
284	-0.065
285	0.053
286	1.022
287	1.318
288	0.536
289	-0.522
290	-1.269
291	-1.019
292	1.270
293	-1.838
294	0.163
295	0.265
296	-1.330
297	-1.327
298	1.859
299	-1.004
300	2.882
301	-0.002
302	0.995
303	-1.357
304	-1.495
305	-0.482
306	-0.333
307	2.400
308	0.265
309	0.578
310	-1.417
311	-1.229
312	1.275
313	-1.012
314	-0.488
315	-0.468
316	0.469
317	0.145
318	0.017
319	-0.756
320	2.856
321	1.674
322**	5.335
323	-0.350
324	0.274
325	0.707
326	-0.193
327	-1.545
328	-1.423
329	-1.095
330	2.654
331	-0.612
332	0.964
333	0.141
334	-1.782
335	0.085
336	1.005
337	0.123
338	-0.658
339	2.257
340	0.676
341	0.766
342	-0.123
343	0.027
344	0.406
345	-0.020
346	-0.808
347	1.353
348	-0.471
349	-0.586
350	0.659
351	1.494
352	-0.084

353	-1.256
354	-0.367
355	0.487
356	0.046
357	1.784
358	0.262
359	0.383
360	-0.554
361	-0.066
362	-0.516
363	-0.003
364	1.386
365	-0.527
366	-0.409
367**	3.018
368	1.220
369	-0.769
370	0.168
371**	3.756
372	0.273
373	-1.363
374	1.048
375	-0.375
376	-0.003
377	-0.236
378	1.777
379	-1.518
380	-1.582
381	-1.035
382	0.774
383	0.536
384	2.329
385	-2.234
386	0.861
387	-2.718
388	-1.368
389	2.345
390	-0.723
391	-0.723
392	0.234
393	-1.999
394	0.092
395	1.899
396	0.405
397	-1.930
398	-1.326
399	1.972
400	-0.973
401	-0.145
402	2.588
403	1.961
404	-1.107
405	0.996
406	0.633
407	1.647
408	-0.995
409	-0.174
410	-0.642
411	-1.252
412	1.476
413	0.283
414	-0.226
415	-0.117
416	2.058
417**	3.748
418**	5.060
419	0.354
420	0.437
421	-1.190
422	0.074
423	1.313
424	2.537
425	0.270
426	-2.192

427	-1.476
428	0.454
429	0.636
430	-0.108
431	0.331
432	-1.337
433	-0.676
434**	3.467
435	2.009
436	2.481
437	1.885
438	1.924
439	0.389
440	1.593
441**	4.594
442	-1.000
443	0.889
444	0.936
445	1.272
446	-1.204
447	0.733
448	2.485
449	2.747
450	-0.034
451	-1.793
452	0.549
453	-0.958
454	0.961
455	1.610
456	1.738
457	0.339
458	0.451
459**	4.557
460**	4.011
461	-1.093
462	-0.630
463	0.543
464	-1.736
465	0.343
466	1.400
467	-0.872
468	0.559
469	1.803
470**	3.702
471	0.416
472	0.555
473	0.032
474	-2.064
475	0.175
476	1.736
477	0.343
478	-0.301
479	1.341
480	-0.979
481	2.119
482	-0.584
483	-1.464
484	1.762
485	1.146
486	1.837
487	-0.499
488**	-3.300
489	1.010
490	-1.448
491	-0.582
492	-0.941
493	0.206
494	0.654
495	-0.447
496	2.453
497	-0.620
498	1.311
499	2.112
500	-0.952

**: Individual with a large Person-Fit Index value

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FACTOR is based on CLAPACK.
Anderson, E., Bai, Z., Bischof, C., Blackford, S., Demmel, J., Dongarra, J., Du Croz, J., Greenbaum, A., Hammarling, S., McKenney, A., & Sorensen, D. (1999). LAPACK Users' Guide. Society for Industrial and Applied Mathematics. Philadelphia, PA

FACTOR can be refered as:
Lorenzo-Seva, U., & Ferrando, P.J. (2006). FACTOR: A computer program to fit the exploratory factor analysis model.Behavioral Research Methods, Instruments and Computers, 38(1), 88-91.

FACTOR completed

Computing time   : 4.45 minutes.
Matrices generated : 5100541

Free download

Factor is a freeware program developed at the Rovira i Virgili University. Users are invited to download a DEMO and the program:

- Download the demo (http://psico.fcep.urv.es/utilitats/factor/soft/factor9.2DEMO.zip)
- Download the program (http://psico.fcep.urv.es/utilitats/factor/soft/factor9.2.zip)

If you work with Excel, the following file can be used to preprocess the data file. Please note that that you must allow macros when opening the preprocessing.xls file:

- Download the preprocessing Excel file (http://psico.fcep.urv.es/utilitats/factor/soft/data_preprocessing.xls)

We would greatly appreciate any suggestions for future improvements. Detailed reports of failures are also welcome.

Version of the program: 9.20 (February, 2013)
This version implements:
- Item Response Theory parametrization of factor solution.
- Expected a-posteriori (EAP) estimation of latent trait scores.
- Semi-confirmatory factor analysis based on orthogonal and oblique rotation to a (partially) specified target.
- Assessment of the congruence between the target and the rotated loading matrix.

Version of the program: 8.10 (April, 2012)
This version implements:
- Greatest lower bound (glb) to reliability, and McDonald's Omega reliability index.
- GFI and AGFI are computed excluding the diagonal values of the variance/covariance matrix.
- Algorithm 462: Bivariate Normal Distribution by Donnelly (1973) is used to compute polychoric correlation matrix. In addition, polychoric correlation matrix is computed with more demanding convergence values.
- Tetrachoric correlation matrix is computed based on AS116 algorithm. This algorithm is more accurate accurate than the algorithm provided in previous versions of the program.
- Technical revisions to solve different errors that halted the analysis and that were reported by users.

Version of the program: 8.02 (March, 2011)
This version implements:
- A more friendly user reading data implementation. ASCII format data files can be separated using different characters, and missing values are eliminated from the data.
- Variable labels are allowed.
- The output data file can be specified.
- New analysis are implemented: Optimal Parallel Analysis, Hull method, and Person fit indices.
- Some analysis have been improved. For example, the polychoric correlations matrix is checked to be positive definite and smoothed (if necessary), and the non-convergent coefficients are changed by the corresponding Pearson coefficient.
- Technical revisions to solve different errors that halted the analysis and that were reported by users.

Version of the program: 7.00 (January, 2007)
This version implements:

- Univariate mean, variance, skewness, and kurtosis.
- Multivariate skewness and kurtosis (Mardia, 1970).
- Var charts for ordinal variables.
- Polychoric correlation matrix with optional Ridge estimates.
- Structure matrix in oblique factor solutions.
- Schmid-Leiman second-order solution (1957).
- Mean, variance and histogram of fitted and standardised residuals. Automatic detection of large standardised residuals.
- In addition, a bug that halted the program during the execution has been detected and corrected.

Version of the program: 6.02 (June, 2006)
This version implements PA - MBS. It is an extension of Parallel Analysis that generates random correlation matrices using marginally bootstrapped samples (Lattin, Carroll, & Green, 2003).

In addition, indices of asymmetry and kurtosis related to the variables are computed. The inspection of these indices helps to decide if polychoric correlation is to be computed when ordinal variables are analysed.

Version of the program: 6.01 (March, 2005)
This version implements the selection of variables to be included and excluded in the analysis.

Documetation

In this section you can find documents that will help you to use Factor, and to best understand the methods that are computed. Some documents are developed by the authors of the program, some other documents have been proposed by users of the program.

Technical reports:

- Ferrando, P.J. & Lorenzo-Seva, U. (2013). Unrestricted item factor analysis and some relations with item response theory. Technical Report. Department of Psychology, Universitat Rovira i Virgili, Tarragona (http://psico.fcep.urv.es/utilitats/factor/documentation/technicalreport.pdf)
- Lorenzo-Seva, U. (2013). How to determine the number of common factors using Hull method. Technical Report. Department of Psychology, Universitat Rovira i Virgili, Tarragona (http://psico.fcep.urv.es/utilitats/factor/documentation/Hullinanutshell.pdf)
- Lorenzo-Seva, U. (2013). Why to rotate my data using Promin? Technical Report. Department of Psychology, Universitat Rovira i Virgili, Tarragona (http://psico.fcep.urv.es/utilitats/factor/documentation/whypromin.pdf)

Program manuals:

- Manual of Factor 9.20 by Dr. G. Visco (Chemistry Department, Rome University, Italy) (http://psico.fcep.urv.es/utilitats/factor/documentation/Manual-of-the-Factor-Program.pdf)
- Manual del programa Factor 8.02 elaborado en español por Sergio Dominguez, Graciela Villegas y Noemi Sotelo (Facultad de Psicología y Trabajo Social, Universidad Inca Garcilaso de la Vega, Perú) (http://psico.fcep.urv.es/utilitats/factor/documentation/Manual_de_Factor_Esp.pdf).

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