```
1          *** CH05SD ***;
2          ************************************************************************;
3          *** The Second International Math Study (SIMS 1980) was a large study of  ***;
4          *** math-related skills, perceptions, and behaviors of middle and high    ***;
5          *** school age students. Students completed questionnaires designed to    ***;
6          *** assess their perceptions of mathematics. The data set includes 12     ***;
7          *** items intended to measure students' perceptions of the usefulness of  ***;
8          *** math in life and career and social perceptions of gender in regard to ***;
9          *** math/science.                                                         ***;
10         *** Responses to questionnaires administered to 1907 students in the      ***;
11         *** United States are included in the data set. In addition, student age  ***;
12         *** and score on one of the math skills tests are also included in the    ***;
13         *** data set. The researcher is ultimately interested in evaluating       ***;
14         *** whether the items significantly predict math test score in a linear   ***;
15         *** regression model.                                                     ***;
16
************************************************************************;
17           *** C2:I CAN GET ALONG WELL WITHOUT MATH     ***;
18           *** C5:MATH NOT NEEDED IN MOST OCCUPATIONS   ***;
19           *** C7:WOULD LIKE JOB THAT USES MATH         ***;
20           *** C13:MATH NOT NEEDED FOR EVERYDAY LIVING  ***;
21           *** C18:A WOMAN NEEDS CAREER AS MUCH AS MAN  ***;
22           *** C21:MATH IS IMPORTANT TO GET A GOOD JOB  ***;
23           *** C38:MEN BETTER SCIENTISTS AND ENGINEERS  ***;
24           *** C39:MATH USEFUL IN EVERYDAY PROBLEMS     ***;
25           *** C42:MATH HAS PRACTICAL USE FOR JOBS      ***;
26           *** C44:BOYS HAVE MORE NATURAL MATH ABILITY  ***;
27           *** C46:MOST DONT USE MATH IN THEIR JOBS     ***;
28           *** C51:BOYS NEED MORE MATH THAN GIRLS       ***;
29           ********************************************;
30           dm "output;clear;log;clear";
31           options ps=56 ls=99 nocenter nodate nonumber nolabel;
32
33           ods html style=minimal File='C:\EXST7037\Factor\SAS examples\ch5_All01.html';
NOTE: Writing HTML Body file: C:\EXST7037\Factor\SAS examples\ch5_All01.html
34           Title1 "Factor Analysis of a math perception study.";
35           Libname amul "C:\EXST7037\Factor\SAS examples\";
NOTE: Libref AMUL was successfully assigned as follows:
      Engine:        V9
      Physical Name: C:\EXST7037\Factor\SAS examples

60           *** Ch5S2D1 ***;
61           proc factor data=amul.mathattitudes method=ml priors=smc scree outstat=facstat;
62              title1 'factor analysis - ML';
63              title2 'extracting factors';
64              var c2--c51;
65           run;
WARNING: 54 of 1907 observations in data set AMUL.MATHATTITUDES omitted due to
missing values.
NOTE: 2 factors will be retained by the PROPORTION criterion.
NOTE: Convergence criterion satisfied.
NOTE: The data set WORK.FACSTAT has 21 observations and 14 variables.
NOTE: The PROCEDURE FACTOR printed pages 17-21.
NOTE: PROCEDURE FACTOR used (Total process time):
      real time           0.09 seconds
      cpu time            0.04 seconds
```

```
factor analysis - ML
extracting factors

The FACTOR Procedure
Initial Factor Method: Maximum Likelihood

                        Prior Communality Estimates: SMC
        C2              C5              C7             C13             C18             C21
0.20385428      0.14201469      0.15595696      0.24161428      0.19590940      0.21349094

       C38             C39             C42             C44             C46             C51
0.40748780      0.23489301      0.23614082      0.35568445      0.17932183      0.35263100

Preliminary Eigenvalues: Total = 4.05914923  Average = 0.33826244

         Eigenvalue    Difference    Proportion    Cumulative
   1     3.27307628    1.51187588        0.8063        0.8063
   2     1.76120039    1.51005102        0.4339        1.2402
   3     0.25114937    0.14732022        0.0619        1.3021
   4     0.10382916    0.08880752        0.0256        1.3277
   5     0.01502164    0.13329576        0.0037        1.3314
   6     -.11827412    0.02231131       -0.0291        1.3022
   7     -.14058543    0.00660116       -0.0346        1.2676
   8     -.14718660    0.04342955       -0.0363        1.2313
   9     -.19061615    0.02282869       -0.0470        1.1844
  10     -.21344484    0.02030456       -0.0526        1.1318
  11     -.23374940    0.06752167       -0.0576        1.0742
  12     -.30127107                     -0.0742        1.0000

2 factors will be retained by the PROPORTION criterion.

factor analysis - ML
extracting factors

The FACTOR Procedure
Initial Factor Method: Maximum Likelihood

Iteration   Criterion   Ridge  Change                      Communalities
    1       0.1162198  0.0000  0.1682  0.24696  0.15323  0.20063  0.29130  0.23265  0.28894
                                       0.57569  0.31442  0.29169  0.48431  0.22989  0.48958
    2       0.1161658  0.0000  0.0043  0.24604  0.15270  0.20178  0.28698  0.23468  0.29084
                                       0.57552  0.31632  0.29470  0.48732  0.22858  0.48582
    3       0.1161648  0.0000  0.0005  0.24557  0.15238  0.20188  0.28650  0.23463  0.29114
                                       0.57570  0.31678  0.29522  0.48720  0.22840  0.48584
Convergence criterion satisfied.

Significance Tests Based on 1853 Observations
                                                          Pr >
            Test                        DF    Chi-Square    ChiSq
H0: No common factors                   66     3925.4576   <.0001
HA: At least one common factor
H0: 2 Factors are sufficient            43      214.4209   <.0001
HA: More factors are needed

Chi-Square without Bartlett's Correction       215.13723
Akaike's Information Criterion                 129.13723
Schwarz's Bayesian Criterion                  -108.41891
Tucker and Lewis's Reliability Coefficient       0.93183

Squared Canonical Correlations
   Factor1         Factor2
0.80440654      0.68699007
```

```
factor analysis - ML
extracting factors

The FACTOR Procedure
Initial Factor Method: Maximum Likelihood


Eigenvalues of the Weighted Reduced Correlation Matrix: Total=6.30743191  Average=0.52561933

        Eigenvalue    Difference    Proportion    Cumulative
   1    4.11264541    1.91785855        0.6520        0.6520
   2    2.19478686    1.85446425        0.3480        1.0000
   3    0.34032260    0.15781180        0.0540        1.0540
   4    0.18251080    0.08677335        0.0289        1.0829
   5    0.09573745    0.08328192        0.0152        1.0981
   6    0.01245553    0.02884201        0.0020        1.1000
   7    -.01638648    0.06176223       -0.0026        1.0974
   8    -.07814871    0.00137562       -0.0124        1.0851
   9    -.07952432    0.02345618       -0.0126        1.0724
  10    -.10298050    0.04211081       -0.0163        1.0561
  11    -.14509131    0.06380411       -0.0230        1.0331
  12    -.20889542                     -0.0331        1.0000

          Factor Pattern
            Factor1         Factor2
C2           0.36472        -0.33541         I CAN GET ALONG WELL WITHOUT MATH
C5           0.30419        -0.24456         MATH NOT NEEDED IN MOST OCCUPATIONS
C7          -0.22209         0.3906          WOULD LIKE JOB THAT USES MATH
C13          0.3744         -0.38242         MATH NOT NEEDED FOR EVERYDAY LIVING
C18         -0.47772        -0.08011         A WOMAN NEEDS CAREER AS MUCH AS MAN
C21         -0.29781         0.44999         MATH IS IMPORTANT TO GET A GOOD JOB
C38          0.69651         0.30095         MEN BETTER SCIENTISTS AND ENGINEERS
C39         -0.36026         0.43249         MATH USEFUL IN EVERYDAY PROBLEMS
C42         -0.36469         0.40286         MATH HAS PRACTICAL USE FOR JOBS
C44          0.60958         0.34002         BOYS HAVE MORE NATURAL MATH ABILITY
C46          0.3425         -0.33328         MOST DONT USE MATH IN THEIR JOBS
C51          0.6197          0.31907         BOYS NEED MORE MATH THAN GIRLS

Variance Explained by Each Factor
Factor        Weighted    Unweighted
Factor1     4.11264541    2.35279740
Factor2     2.19478686    1.44844422

Final Communality Estimates and Variable Weights
Total Communality: Weighted = 6.307432   Unweighted = 3.801242

Variable    Communality        Weight
C2           0.24552032    1.32550907
C5           0.15233973    1.17977419
C7           0.20189581    1.25294489
C13          0.28642071    1.40153735
C18          0.23463635    1.30655501
C21          0.29118285    1.41071961
C38          0.57570374    2.35684047
C39          0.31683592    1.46366554
C42          0.29529481    1.41889016
C44          0.48719697    1.95007451
C46          0.22838238    1.29601338
C51          0.48583203    1.94490773
```

```
73         *** Ch5S2D2 ***;
74         ods output orthrotfactpat = mathfpv;
75         ods select orthrotfactpat;
76         proc factor data=facstat method=ml priors=smc n=2 cover=0.3 r=v outstat=facrv;
77            title1 'factor analysis - ML';
78            title2 'varimax rotation';
79            var c2--c51;
80         run;
NOTE: 2 factors will be retained by the NFACTOR criterion.
NOTE: Convergence criterion satisfied.
NOTE: The data set WORK.MATHFPV has 12 observations and 11 variables.
NOTE: The data set WORK.FACRV has 29 observations and 14 variables.
NOTE: The PROCEDURE FACTOR printed pages 25-26.
NOTE: PROCEDURE FACTOR used (Total process time):
      real time           0.06 seconds
      cpu time            0.01 seconds
```

The FACTOR Procedure
Rotation Method: Varimax

Rotated Factor Pattern
With 95% confidence limits; Cover |*| = 0.3?
Estimate/StdErr/LowerCL/UpperCL/Coverage Display

	Factor1	Factor2			
C2	-0.47800	0.13052	C38	-0.11552	0.74991
	0.02245	0.02308		0.01892	0.01625
	-0.52079	0.08504		-0.15244	0.71628
	-0.43282	0.17545		-0.07829	0.78006
	[]*0	0[]*		*[]0	0*[]
C5	-0.36887	0.12756	C39	0.55785	-0.07510
	0.02431	0.02441		0.02118	0.02198
	-0.41553	0.07945		0.51496	-0.11801
	-0.32028	0.17508		0.59796	-0.03191
	[]*0	0[]*		0*[]	*[]0
C7	0.44890	0.01963	C42	0.53511	-0.09461
	0.02339	0.02302		0.02153	0.02225
	0.40189	-0.02549		0.49159	-0.13801
	0.49355	0.06467		0.57596	-0.05085
	0*[]	[0]*		0*[]	*[]0
C13	-0.52296	0.11371	C44	-0.03621	0.69706
	0.02168	0.02246		0.01963	0.01728
	-0.56415	0.06949		-0.07461	0.66160
	-0.47918	0.15748		0.00230	0.72940
	[]*0	0[]*		*[0]	0*[]
C18	0.18620	-0.44718	C46	-0.46438	0.11283
	0.02355	0.02159		0.02275	0.02310
	0.13967	-0.48848		-0.50779	0.06736
	0.23191	-0.40388		-0.41863	0.15784
	0[]*	[]*0		[]*0	0[]*
C21	0.53946	-0.01291	C51	-0.05933	0.69449
	0.02172	0.02218		0.01960	0.01722
	0.49553	-0.05633		-0.09763	0.65919
	0.58064	0.03055		-0.02085	0.72673
	0*[]	*[0]		*[]0	0*[]

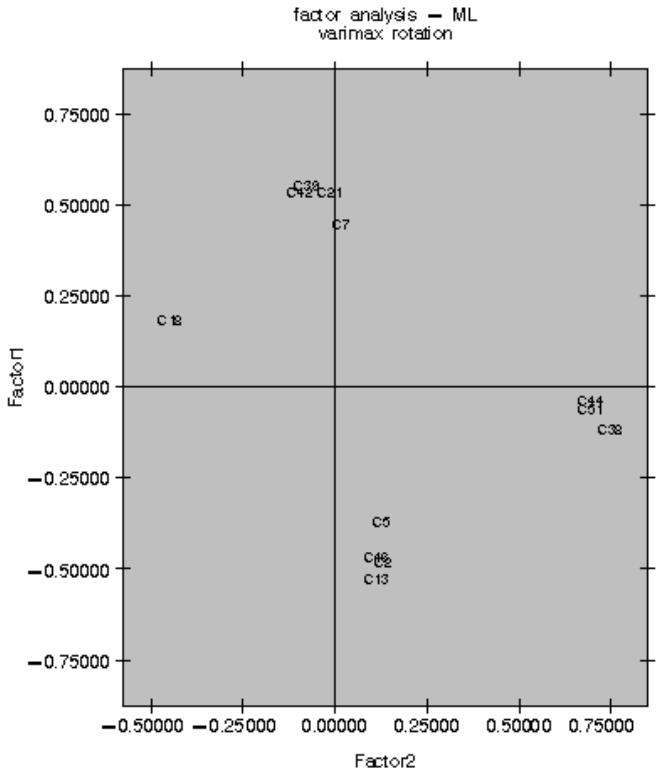
Table 27.2 from SAS help explaining indications of Coverage Displays.

Positive Estimate	Negative Estimate	COVER=0 specified	Interpretation
[0]*	*[0]		The estimate is not significantly different from zero and the CI covers a region of values that are smaller in magnitude than the COVER= value. This is strong statistical evidence for the non-salience of the variable-factor relationship.
0[ ]*	*[ ]0		The estimate is significantly different from zero but the CI covers a region of values that are smaller in magnitude than the COVER= value. This is strong statistical evidence for the non-salience of the variable-factor relationship.
[0*]	[*0]	[0]	The estimate is not significantly different from zero or the COVER= value. The population value might have been larger or smaller in magnitude than the COVER= value. There is no statistical evidence for the salience of the variable-factor relationship.
0[*]	[*]0		The estimate is significantly different from zero but not from the COVER= value. This is marginal statistical evidence for the salience of the variable-factor relationship.
0*[ ]	[ ]*0	0[ ] or [ ]0	The estimate is significantly different from zero and the CI covers a region of values that are larger in magnitude than the COVER= value. This is strong statistical evidence for the salience of the variable-factor relationship

```
%let plotitop = cback = white, cframe = ligr, color = black, colors = black;

title3 'reference axis correlation = 0.25854';

%plotit (data = mathfpp, plotvars = factor1 factor2, labelvar = _blank_,
        symvar = variable, typevar = variable, symsize = .75, symlen = 3,
        tsize = 1, href = 0, vref = 0);
title;
```




```
86          *** Ch5S2D3 ***;
87          proc factor data = facstat method = ml priors = smc n=2 cover = .3 r=p;
88           title1 'factor analysis - ML';
89           title2 'promax rotation';
90           var c2--c51;
91          run;
NOTE: 2 factors will be retained by the NFACTOR criterion.
NOTE: Convergence criterion satisfied.
NOTE: The PROCEDURE FACTOR printed pages 24-37.
NOTE: PROCEDURE FACTOR used (Total process time):
      real time           0.03 seconds
      cpu time            0.03 seconds


factor analysis - ML
promax rotation

The FACTOR Procedure
Initial Factor Method: Maximum Likelihood

                        Prior Communality Estimates: SMC
        C2              C5              C7             C13             C18             C21
0.20385428      0.14201469      0.15595696      0.24161428      0.19590940      0.21349094

       C38             C39             C42             C44             C46             C51
0.40748780      0.23489301      0.23614082      0.35568445      0.17932183      0.35263100
```

Preliminary Eigenvalues: Total = 4.05914923 Average = 0.33826244

	Eigenvalue	Difference	Proportion	Cumulative
1	3.27307628	1.51187588	0.8063	0.8063
2	1.76120039	1.51005102	0.4339	1.2402
3	0.25114937	0.14732022	0.0619	1.3021
4	0.10382916	0.08880752	0.0256	1.3277
5	0.01502164	0.13329576	0.0037	1.3314
6	-.11827412	0.02231131	-0.0291	1.3022
7	-.14058543	0.00660116	-0.0346	1.2676
8	-.14718660	0.04342955	-0.0363	1.2313
9	-.19061615	0.02282869	-0.0470	1.1844
10	-.21344484	0.02030456	-0.0526	1.1318
11	-.23374940	0.06752167	-0.0576	1.0742
12	-.30127107		-0.0742	1.0000

2 factors will be retained by the NFACTOR criterion.

Iteration	Criterion	Ridge	Change	Communalities					
1	0.1162198	0.0000	0.1682	0.24696	0.15323	0.20063	0.29130	0.23265	0.28894
				0.57569	0.31442	0.29169	0.48431	0.22989	0.48958
2	0.1161658	0.0000	0.0043	0.24604	0.15270	0.20178	0.28698	0.23468	0.29084
				0.57552	0.31632	0.29470	0.48732	0.22858	0.48582
3	0.1161648	0.0000	0.0005	0.24557	0.15238	0.20188	0.28650	0.23463	0.29114
				0.57570	0.31678	0.29522	0.48720	0.22840	0.48584

Convergence criterion satisfied.

Initial Factor Method: Maximum Likelihood

Significance Tests Based on 1853 Observations			Pr >
Test	DF	Chi-Square	ChiSq
H0: No common factors	66	3925.4576	<.0001
HA: At least one common factor			
H0: 2 Factors are sufficient	43	214.4209	<.0001
HA: More factors are needed			

Chi-Square without Bartlett's Correction	215.13723
Akaike's Information Criterion	129.13723
Schwarz's Bayesian Criterion	-108.41891
Tucker and Lewis's Reliability Coefficient	0.93183

Squared Canonical Correlations

Factor1	Factor2
0.80440654	0.68699007

Eigenvalues of the Weighted Reduced Correlation Matrix: Total=6.30743191 Average=0.52561933

	Eigenvalue	Difference	Proportion	Cumulative
1	4.11264541	1.91785855	0.6520	0.6520
2	2.19478686	1.85446425	0.3480	1.0000
3	0.34032260	0.15781180	0.0540	1.0540
4	0.18251080	0.08677335	0.0289	1.0829
5	0.09573745	0.08328192	0.0152	1.0981
6	0.01245553	0.02884201	0.0020	1.1000
7	-.01638648	0.06176223	-0.0026	1.0974
8	-.07814871	0.00137562	-0.0124	1.0851
9	-.07952432	0.02345618	-0.0126	1.0724
10	-.10298050	0.04211081	-0.0163	1.0561
11	-.14509131	0.06380411	-0.0230	1.0331
12	-.20889542		-0.0331	1.0000

The FACTOR Procedure
Initial Factor Method: Maximum Likelihood

Factor Pattern
With 95% confidence limits; Cover |*| = 0.3?
Estimate/StdErr/LowerCL/UpperCL/Coverage Display

	Factor1	Factor2			
C2	0.36472	-0.33541	C38	0.69651	0.30095
	0.03118	0.02881		0.02488	0.03450
	0.30361	-0.39187		0.64775	0.23334
	0.42584	-0.27894		0.74528	0.36856
	0*[]	[*]0		0*[]	0[*]
C5	0.30419	-0.24456	C39	-0.36026	0.43249
	0.02843	0.02873		0.03567	0.02774
	0.24846	-0.30087		-0.43017	0.37813
	0.35992	-0.18824		-0.29034	0.48686
	0[*]	[*]0		[*]0	0*[]
C7	-0.22209	0.39060	C42	-0.36469	0.40286
	0.03506	0.02630		0.03420	0.02814
	-0.29080	0.33905		-0.43172	0.34770
	-0.15338	0.44215		-0.29765	0.45802
	*[]0	0*[]		[*]0	0*[]
C13	0.37440	-0.38242	C44	0.60958	0.34002
	0.03314	0.02851		0.02735	0.03337
	0.30945	-0.43831		0.55597	0.27461
	0.43935	-0.32653		0.66319	0.40543
	0*[]	[]*0		0*[]	0[*]
C18	-0.47772	-0.08011	C46	0.34250	-0.33328
	0.02139	0.03191		0.03137	0.02850
	-0.51964	-0.14265		0.28102	-0.38913
	-0.43580	-0.01757		0.40399	-0.27742
	[]*0	*[]0		0[*]	[*]0
C21	-0.29781	0.44999	C51	0.61970	0.31907
	0.03717	0.02654		0.02617	0.03373
	-0.37066	0.39796		0.56841	0.25296
	-0.22496	0.50202		0.67098	0.38518
	[*]0	0*[]		0*[]	0[*]

Variance Explained by Each Factor

Factor	Weighted	Unweighted
Factor1	4.11264541	2.35279740
Factor2	2.19478686	1.44844422

Final Communality Estimates and Variable Weights
Total Communality: Weighted = 6.307432 Unweighted = 3.801242

Variable	Communality	Weight			
C2	0.24552032	1.32550907	C38	0.57570374	2.35684047
C5	0.15233973	1.17977419	C39	0.31683592	1.46366554
C7	0.20189581	1.25294489	C42	0.29529481	1.41889016
C13	0.28642071	1.40153735	C44	0.48719697	1.95007451
C18	0.23463635	1.30655501	C46	0.22838238	1.29601338
C21	0.29118285	1.41071961	C51	0.48583203	1.94490773

Orthogonal Transformation Matrix

	1	2
1	-0.53178	0.84688
2	0.84688	0.53178

Rotated Factor Pattern
With 95% confidence limits; Cover |*| = 0.3?
Estimate/StdErr/LowerCL/UpperCL/Coverage Display

	Factor1	Factor2
C2	-0.47800	0.13052
	0.02245	0.02308
	-0.52079	0.08504
	-0.43282	0.17545
	[]*0	0[]*
C5	-0.36887	0.12756
	0.02431	0.02441
	-0.41553	0.07945
	-0.32028	0.17508
	[]*0	0[]*
C7	0.44890	0.01963
	0.02339	0.02302
	0.40189	-0.02549
	0.49355	0.06467
	0*[]	[0]*
C13	-0.52296	0.11371
	0.02168	0.02246
	-0.56415	0.06949
	-0.47918	0.15748
	[]*0	0[]*
C18	0.18620	-0.44718
	0.02355	0.02159
	0.13967	-0.48848
	0.23191	-0.40388
	0[]*	[]*0
C21	0.53946	-0.01291
	0.02172	0.02218
	0.49553	-0.05633
	0.58064	0.03055
	0*[]	*[0]
C38	-0.11552	0.74991
	0.01892	0.01625
	-0.15244	0.71628
	-0.07829	0.78006
	*[]0	0*[]
C39	0.55785	-0.07510
	0.02118	0.02198
	0.51496	-0.11801
	0.59796	-0.03191
	0*[]	*[]0
C42	0.53511	-0.09461
	0.02153	0.02225
	0.49159	-0.13801
	0.57596	-0.05085
	0*[]	*[]0
C44	-0.03621	0.69706
	0.01963	0.01728
	-0.07461	0.66160
	0.00230	0.72940
	*[0]	0*[]
C46	-0.46438	0.11283
	0.02275	0.02310
	-0.50779	0.06736
	-0.41863	0.15784
	[]*0	0[]*
C51	-0.05933	0.69449
	0.01960	0.01722
	-0.09763	0.65919
	-0.02085	0.72673
	*[]0	0*[]

Variance Explained by Each Factor

Factor	Weighted	Unweighted
Factor1	2.73713808	1.99660823
Factor2	3.57029418	1.80463339

Final Communality Estimates and Variable Weights
Total Communality: Weighted = 6.307432 Unweighted = 3.801242

Variable	Communality	Weight
C2	0.24552032	1.32550907
C5	0.15233973	1.17977419
C7	0.20189581	1.25294489
C13	0.28642071	1.40153735
C18	0.23463635	1.30655501
C21	0.29118285	1.41071961
C38	0.57570374	2.35684047
C39	0.31683592	1.46366554
C42	0.29529481	1.41889016
C44	0.48719697	1.95007451
C46	0.22838238	1.29601338
C51	0.48583203	1.94490773

*Target Matrix for Procrustean Transformation

	Factor1	Factor2
C2	-0.89853	0.01835
C5	-0.84487	0.03505
C7	0.99800	0.00008
C13	-0.93386	0.00963
C18	0.05685	-0.78994
C21	1.00000	-0.00001
C38	-0.00353	0.96934
C39	0.97425	-0.00238
C42	0.95570	-0.00530
C44	-0.00014	1.00000
C46	-0.91835	0.01321
C51	-0.00062	0.99316

Procrustean Transformation Matrix

	1	2
1	1.92396877	0.19750147
2	0.24081593	1.43263147

Normalized Oblique Transformation Matrix

	1	2
1	-0.43735	0.79330
2	0.93827	0.66507

Inter-Factor Correlations
With 95% confidence limits
Estimate/StdErr/LowerCL/UpperCL

	Factor1	Factor2
Factor1	1.00000	-0.25854
	0.00000	0.02726
	.	-0.31114
	.	-0.20437
Factor2	-0.25854	1.00000
	0.02726	0.00000
	-0.31114	.
	-0.20437	.

Rotated Factor Pattern (Standardized Regression Coefficients)
With 95% confidence limits; Cover |*| = 0.3?
Estimate/StdErr/LowerCL/UpperCL/Coverage Display

	Factor1	**Factor2**
I CAN GET ALONG WELL WITHOUT MATH		
C2	-0.47421	0.06627
	0.02368	0.02335
	-0.51929	0.02040
	-0.42650	0.11185
	[]*0	0[]*
MATH NOT NEEDED IN MOST OCCUPATIONS		
C5	-0.36250	0.07866
	0.02559	0.02543
	-0.41158	0.02867
	-0.31133	0.12826
	[]*0	0[]*
WOULD LIKE JOB THAT USES MATH		
C7	0.46363	0.08359
	0.02418	0.02276
	0.41492	0.03885
	0.50968	0.12800
	0*[]	0[]*
MATH NOT NEEDED FOR EVERYDAY LIVING		
C13	-0.52256	0.04268
	0.02282	0.02220
	-0.56584	-0.00088
	-0.47640	0.08607
	[]*0	[0]*
A WOMAN NEEDS CAREER AS MUCH AS MAN		
C18	0.13377	-0.43225
	0.02449	0.02309
	0.08549	-0.47640
	0.18142	-0.38594
	0[]*	[]*0
MATH IS IMPORTANT TO GET A GOOD JOB		
C21	0.55246	0.06302
	0.02249	0.02099
	0.50684	0.02180
	0.59500	0.10403
	0*[]	0[]*
MEN BETTER SCIENTISTS AND ENGINEERS		
C38	-0.02225	0.75269
	0.01643	0.01721
	-0.05442	0.71695
	0.00997	0.78449
	*[0]	0*[]
MATH USEFUL IN EVERYDAY PROBLEMS		
C39	0.56336	0.00185
	0.02215	0.02104
	0.51840	-0.03937
	0.60521	0.04306
	0*[]	[0]*
MATH HAS PRACTICAL USE FOR JOBS		
C42	0.53749	-0.02137
	0.02259	0.02172
	0.49174	-0.06389
	0.58028	0.02122
	0*[]	*[0]
BOYS HAVE MORE NATURAL MATH ABILITY		
C44	0.05243	0.70971
	0.01699	0.01804
	0.01909	0.67253
	0.08566	0.74332
	0[]*	0*[]
MOST DONT USE MATH IN THEIR JOBS		
C46	-0.46250	0.05006
	0.02395	0.02342
	-0.50812	0.00409
	-0.41429	0.09582
	[]*0	0[]*
BOYS NEED MORE MATH THAN GIRLS		
C51	0.02835	0.70381
	0.01720	0.01804
	-0.00537	0.66669
	0.06201	0.73745
	[0]*	0*[]

Reference Axis Correlations

	Factor1	Factor2
Factor1	1.00000	0.25854
Factor2	0.25854	1.00000

Reference Structure (Semipartial Correlations)

	Factor1	Factor2
C2	-0.45809	0.06401
C5	-0.35018	0.07599
C7	0.44786	0.08075
C13	-0.50479	0.04122
C18	0.12922	-0.41756
C21	0.53368	0.06088
C38	-0.02149	0.72710
C39	0.54420	0.00178
C42	0.51922	-0.02065
C44	0.05065	0.68558
C46	-0.44677	0.04835
C51	0.02739	0.67988

Variance Explained by Each Factor Eliminating Other Factors

Factor	Weighted	Unweighted
Factor1	2.53710802	1.85850256
Factor2	3.32105388	1.65985219

Factor Structure (Correlations)
With 95% confidence limits; Cover |*| = 0.3?
Estimate/StdErr/LowerCL/UpperCL/Coverage Display

	Factor1	**Factor2**
C2	-0.49135	0.18887
	0.02205	0.02507
	-0.53335	0.13930
	-0.44693	0.23750
	[]*0	0[]*
C5	-0.38284	0.17239
	0.02386	0.02597
	-0.42861	0.12107
	-0.33511	0.22278
	[]*0	0[]*
C7	0.44201	-0.03627
	0.02326	0.02454
	0.39529	-0.08426
	0.48645	0.01188
	0*[]	*[0]
C13	-0.53359	0.17778
	0.02132	0.02466
	-0.57407	0.12906
	-0.49051	0.22565
	[]*0	0[]*
C18	0.24553	-0.46684
	0.02562	0.02132
	0.19469	-0.50757
	0.29505	-0.42402
	0[]*	[]*0
C21	0.53617	-0.07981
	0.02156	0.02401
	0.49257	-0.12666
	0.57708	-0.03261
	0*[]	*[]0
C38	-0.21685	0.75845
	0.02569	0.01589
	-0.26659	0.72553
	-0.16597	0.78790
	*[]0	0*[]
C39	0.56288	-0.14381
	0.02088	0.02423
	0.52059	-0.19094
	0.60241	-0.09601
	0*[]	*[]0
C42	0.54302	-0.16034
	0.02120	0.02446
	0.50015	-0.20786
	0.58323	-0.11206
	0*[]	*[]0
C44	-0.13106	0.69616
	0.02459	0.01721
	-0.17890	0.66086
	-0.08260	0.72838
	*[]0	0*[]
C46	-0.47544	0.16963
	0.02240	0.02506
	-0.51814	0.12014
	-0.43038	0.21828
	[]*0	0[]*
C51	-0.15362	0.69648
	0.02465	0.01703
	-0.20152	0.66156
	-0.10497	0.72838
	*[]0	0*[]

Variance Explained by Each Factor Ignoring Other Factors

Factor	Weighted	Unweighted
Factor1	2.98637839	2.14138943
Factor2	3.77032424	1.94273905

Final Communality Estimates and Variable Weights
Total Communality: Weighted = 6.307432 Unweighted = 3.801242

Variable	Communality	Weight		Variable	Communality	Weight
C2	0.24552032	1.32550907		C38	0.57570374	2.35684047
C5	0.15233973	1.17977419		C39	0.31683592	1.46366554
C7	0.20189581	1.25294489		C42	0.29529481	1.41889016
C13	0.28642071	1.40153735		C44	0.48719697	1.95007451
C18	0.23463635	1.30655501		C46	0.22838238	1.29601338
C21	0.29118285	1.41071961		C51	0.48583203	1.94490773

```
117        *perform reliability anlaysis;
118        proc corr data = amul.mathrevcode alpha nocorr nomiss nosimple;
119        title 'factor one';
120        var c2 c5 c7 c13 c21 c39 c42 c46;
121        run;
NOTE: PROCEDURE CORR used (Total process time):
      real time           0.00 seconds
      cpu time            0.00 seconds
122        proc corr data = amul.mathrevcode alpha nocorr nomiss nosimple;
123        title 'factor two';
124        var c18 c38 c44 c51;
125        run;
NOTE: PROCEDURE CORR used (Total process time):
      real time           0.00 seconds
      cpu time            0.00 seconds
125      !      title;
```

The CORR Procedure

8 Variables: C2 C5 C7 C13 C21 C39 C42 C46

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.713829
Standardized	0.722566

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha	Label
C2	0.412547	0.684140	0.410891	0.695486	C2:I CAN GET ALONG WELL WITHOUT MATH
C5	0.324328	0.707991	0.322866	0.713291	C5:MATH NOT NEEDED IN MOST OCCUPATIONS
C7	0.350508	0.697697	0.359395	0.705982	C7:WOULD LIKE JOB THAT USES MATH
C13	0.472093	0.670440	0.463917	0.684440	C13:MATH NOT NEEDED FOR EVERYDAY LIVING
C21	0.430875	0.681004	0.438425	0.689781	C21:MATH IS IMPORTANT TO GET A GOOD JOB
C39	0.448885	0.678524	0.458135	0.685656	C39:MATH USEFUL IN EVERYDAY PROBLEMS
C42	0.437895	0.681425	0.447780	0.687827	C42:MATH HAS PRACTICAL USE FOR JOBS
C46	0.407699	0.685015	0.407847	0.696113	C46:MOST DONT USE MATH IN THEIR JOBS

```
factor two                                                                                                    39

The CORR Procedure

   4  Variables:    C18      C38      C44      C51


 Cronbach Coefficient Alpha

Variables              Alpha
----------------------------
Raw                 0.746918
Standardized        0.745224


                        Cronbach Coefficient Alpha with Deleted Variable

               Raw Variables       Standardized Variables

Deleted   Correlation             Correlation
Variable   with Total      Alpha   with Total       Alpha  Label
-------------------------------------------------------------------------------------------------------
C18          0.403128   0.759765     0.402542    0.760231  C18:A WOMAN NEEDS CAREER AS MUCH AS MAN
C38          0.617507   0.642828     0.616397    0.642075  C38:MEN BETTER SCIENTISTS AND ENGINEERS
C44          0.570657   0.671839     0.567300    0.670623  C44:BOYS HAVE MORE NATURAL MATH ABILITY
C51          0.581545   0.666769     0.578690    0.664077  C51:BOYS NEED MORE MATH THAN GIRLS
```