WEEK 3 ASSIGNMENT

Concepts of Statistics 2 – DATA-51200 | Spring 2 2020

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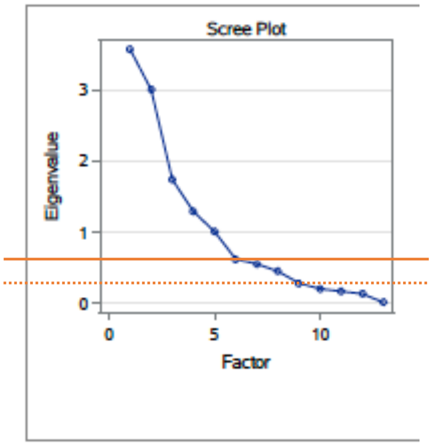
1. In your own words, describe the stage 6 and stage 7 in Factor Analysis.

Stage 6 in Factor Analysis refers to the validation step in which the researcher has to make sure that the results are valid and generalizable to the whole population. Approaches to validation are either a split sample approach where a part of the original sample is used, and the analysis performed again. Replication can also be done using a separate sample if available. However, comparison of replicates has proved challenging. Another technique in validating the results from Factor Analysis is confirmatory analysis which uses structural equation modeling, a combination technique of Factor Analysis and Multiple Regression Analysis and allows for direct comparison.

If summarizing data with Factor Analysis is not sufficient, the researcher can proceed to data reduction (stage 7 of Factor Analysis). This process results in new variables that are created through either selecting a surrogate variable based on the variable with the highest factor loading or through replacing the original variables with a smaller variable set derived either from summated scales or factor scores. While selecting a single surrogate variable is a straightforward approach, it can lead to misleading results or underestimate measurement error both of which can be an effect of using only a single variable. Summated scales are a composite made up of several variables and can thus represent more complex structures. Another composite measure are factor scores which are the result of factor loadings of all variables on the factor. Each of the three data reduction methods come with advantages and disadvantages, and the researcher needs to address those based on individual research objectives.

2. For the following scree plot, what are the number of Factors? Explain



The scree plot graphs the extracted latent roots (Eigenvalues) against the number of factors in order of their extraction. The first factor has the highest Eigenvalue and subsequent factors have smaller values leading to a curve with downward trend.
One stopping rule to determine the number of factors to be extracted is the Scree Test Criterion which can be determined with the help of the scree plot. At the "elbow" point, when the curve starts to flatten (orange line), the cut-off is being drawn and the number of factors up to that line is counted. Omitting the elbow, five factors would be retained in this analysis. Whereas most researchers don´t include the elbow point, some do include and would hence extract six factors. Some may even choose more factors and draw the line further below (dotted orange line). However, the latter approach is not advisable because the factors further down represent more unique rather than common variance.
Using the graph, one can also apply the Latent Root Criterion for a decision on the stopping-point. All factors with an Eigenvalue of greater than 1 should be considered significant. In our example that would also lead to 5 factors. Since both the Scree Test Criterion on the Latent Root Criterion suggest 5 factors, I would retain 5 factors from this analysis.

3. For the following Eigenvalues tables, how many Factors are there? Explain

Eigenvalues of the Correlation Matrix: Total = 13 Average = 1				
	Eigenvalue	Difference	Proportion	Cumulative
1	3.56707480	0.56943025	0.2744	0.2744
2	2.99764455	1.25956706	0.2306	0.5050
3	1.73807749	0.45085244	0.1337	0.6387
4	1.28722505	0.28198745	0.0990	0.7377
5	1.00523760	0.38662334	0.0773	0.8150
6	0.61861426	0.06718656	0.0476	0.8626
7	0.55142770	0.10443379	0.0424	0.9050
8	0.44699392	0.16625812	0.0344	0.9394
9	0.28073579	0.08002691	0.0216	0.9610

The table shows the results from the extraction of component factors with 9 derived factors. The explanatory power of each factor is represented by its Eigenvalue and the factors are ordered in descending values of their Eigenvalues. The first factor is the most important one explaining most of the common variance among variables in the data set and the second and subsequent factors explaining less. This can also be seen in the Proportion and Cumulative columns displaying individual factor variance and summated variances, respectively.
To determine the number of factors from this table, I am using the Latent Root Criterion with a cut off value of 1.0 for the Eigenvalue. Thus, I would choose to retain five factors (1 to 5) from this analysis, as denoted by the orange line. These five factors together explain 81.5% of the common variance among the variables in the data set which seems a reasonable result.

4. For the following Factor Pattern. Assign the variables to the related factors. What issues do you see here and how to overcome them? Explain.

Factor Pattern

		Factor1	Factor2	Factor3	Factor4	Factor5
x6	x6	0.01595	0.62692	-0.06169	0.53353	0.05020
x7	x7	0.46134	-0.44821	0.47330	0.38828	-0.09795
x8	x8	0.13049	0.47450	0.69219	-0.41398	0.01428
x9	x9	0.86338	0.21309	-0.26428	-0.11618	-0.08618
x10	x10	0.48204	-0.36304	0.24123	0.37036	0.12587
x11	x11	0.47680	0.73057	-0.13671	0.24679	-0.03214
x12	x12	0.54958	-0.47234	0.47286	0.33537	-0.01313
x13	x13	-0.01557	-0.74837	-0.01856	-0.17447	0.02335
x14	x14	0.24261	0.46395	0.68921	-0.36627	0.13040
x15	x15	0.12406	-0.02080	-0.12530	0.01733	0.97266
x16	x16	0.81307	0.17611	-0.22195	-0.16898	-0.05676
x17	x17	0.52608	-0.64952	-0.19756	-0.39227	0.01362
x18	x18	0.90413	0.12610	-0.28542	-0.09519	-0.03778

Examination of the factor-loading pattern helps with identifying the underlying structure of variables with each column representing the loadings for one factor.
From this matrix, I don´t know what the sample size of the analysis was, as it is not stated somewhere. Assuming that it is the HBAT data set with a sample size of 100, the significance criterion for the factor loadings can be set to 0.55 (see Table 3.2, Hair *et al.,* 2019).
I went through the factor loadings for each factor and highlighted all factor loading values greater than ±0.55 (yellow). From this analysis, it can be seen that variables x9, x16 and x18 belong to Factor 1, variables x6, x11, x13 and x17 belong to Factor 2, variables x8 and x14 belong to Factor 3 and variable x15 belongs to Factor 5. No variable was found to belong to Factor 4 when applying the 0.55 threshold criterion. However, variable x6 has with 0.52252 an almost significant factor loading for factor 4. From this observation, a potential cross-loading problem arises for variable x6 which has high factor loadings for factor 2 (0.62692) and factor 4 (0.53353). The same is true for variable x17 which has high factor loadings for factor 1 (0.52608) and factor 2 (-0.64952). These cross-loading problems can be addressed by calculating the ratio between the larger loadings and the smaller loadings and subsequent categorization into ignorable (>2.0), potential (between 1.5 and 2.0) and problematic (between 1.0 and 1.5). The ratios of the factor loadings for x6 and x17 are 1.18 and 1.23, respectively. Thus, based on the previous categorization, these two variables should be deleted from the data set.
It should also be noted that variables x7 and x12 don´t belong to any of the five factors. When examining variable x7, we can make out four relatively high factor loadings and one very low loading. Variable x10 has one relatively high factor loading with factor 1 (0.48204) and four somewhat smaller loadings with no loading being very low (under ± 0.1). These variables could be either ignored or further analysis is performed using a rotation technique or an alternative rotation technique.
I would recommend applying further rotation analysis as the current pattern is not meaningful and issues of cross-loadings, variables without significant factor loadings and factors without variables assigned.

5. For the data set associated with this homework (HBAT (you may use any software and programming language you feel comfortable dealing with. Make sure to include your codes, diagrams and results). For variables X6 up to X18 excluding (do NOT include) variables X15 and X17,
a. Find the Scree plot and use it to determine the number of factors.
b. Find the Eigenvalues of the correlation matrix and use it to find the number of factors.
c. Using your answer in b, find the factor pattern and use it to find which variables associate with each Factor.
d. Discuss any issues in part (c) and show how you can solve them.

For the analysis of the HBAT data set SAS studio was used.
a)

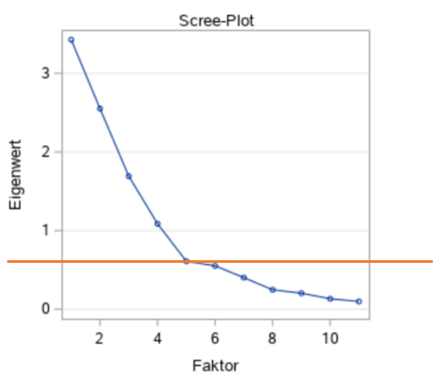


Figure 1. Scree Plot resulting from the Factor Analysis of the HBT dataset. Eigenvalues (Eigenwert) are plotted against the extracted factors (Faktor).

Based on the scree plot in Figure 1, I would choose the Scree Plot Criterion (orange line) to be drawn at the elbow at the fifth factor. Thus, four factors should be retained. This also confirms the Eigenvalue Criterion which extracts factors with an eigenvalue of greater than 1 (see Figure 1 and Table 1). Since factor five has an Eigenvalue of only 0.6, this factor should not be included anymore. The four extracted factors explain together a common variance of 79.59% of the 11 variables which is considered sufficient.

b)

Eigenwerte der Korrelationsmatrix: Gesamt = 11 Durchschn. = 1					
	Eigenwert	Differenz	Proportion	Kumuliert
1	3.42697133	0.87607462	0.3115	0.3115
2	2.55089671	0.85992024	0.2319	0.5434
3	1.69097648	0.60442042	0.1537	0.6972
4	1.08655606	0.47713196	0.0988	0.7959
5	0.60942409	0.05754032	0.0554	0.8513
6	0.55188378	0.15036563	0.0502	0.9015
7	0.40151815	0.15456660	0.0365	0.9380
8	0.24695154	0.04339828	0.0225	0.9605
9	0.20355327	0.07071169	0.0185	0.9790
10	0.13284158	0.03441456	0.0121	0.9911
11	0.09842702		0.0089	1.0000

Table 1. Eigenvalue table from Factor Analysis of HBAT data set (variables x6-x18 excluding x15 and x17)

Based on Table 1 and using the Eigenvalue Criterion of >1.0, we can extract and retain 4 factors.

c)

Re-running the analysis with 4 factors, yields the following unrotated factor matrix (Table 2). Examining the significant factor loadings (greater than 0.55 for a sample size of 100), yields a pattern (Table 2, yellow markings) with 4 variables for factor 1 and factor 2, two variables for factor 3 and 1 variable for factor 4. Since factor 2 has the same number of significant factor loadings as factor 1 and factor 4 only has one variable an interpretation seems not meaningful.

Faktormuster					
		Factor1	Factor2	Factor3	Factor4
x18	x18	0.87579	0.11667	-0.30250	-0.20569
x9	x9	0.87133	0.03105	-0.27354	-0.21506
x16	x16	0.80938	0.04216	-0.21967	-0.24689
x11	x11	0.71598	-0.45484	-0.15121	0.21150
x12	x12	0.37703	0.75177	0.31384	0.23159
x7	x7	0.30721	0.71314	0.30591	0.28392
x13	x13	-0.28081	0.66035	-0.06898	-0.34768
x10	x10	0.34013	0.58083	0.11456	0.33137
x8	x8	0.29192	-0.36889	0.79447	-0.20159
x14	x14	0.39418	-0.30613	0.77836	-0.19316
x6	x6	0.24767	-0.50070	-0.08098	0.67039

Table 2. Unrotated component Analysis Factor Matrix.

Varianz erkärt nach jedem Faktor			
Factor1	Factor2	Factor3	Factor4
3.4269713	2.5508967	1.6909765	1.0865561

Table 3. Explained variance for each factor.

Assessing the communalities of the variables, expressed as the squared factor loadings for each variable, shows how much variance is explained from the four factors together. A significance threshold of 0.5 is indicative of the circumstance that most of the variance has been extracted by the factor solution. Table 4 shows the communalities for the variables in the analysis. All variables exhibit a communality of greater than 0.5.

Endgült. Kommunalität Schätzung: Gesamte = 8.755401										
x6	x7	x8	x9	x10	x11	x12	x13	x14	x16	x18
0.76802937	0.77714736	0.89311235	0.88126008	0.57597858	0.78710502	0.85944643	0.64055781	0.89224653	0.76608666	0.91443037

Table 4. Communalities of variables in unrotated factor matrix.

d)

Applying rotation methods can aid in solving the encountered issues of maximizing loadings on each variable per factor as well as cross-loadings. I have applied oblique rotation using the PROMAX function in SAS Studio.

Rotiertes Faktormuster (Standardisierte Regressionskoeffizienten)					
		Factor1	Factor2	Factor3	Factor4
x18	x18	0.95663	0.05532	-0.06120	-0.03747
x9	x9	0.94208	-0.00101	-0.00989	-0.00727
x16	x16	0.88464	-0.01037	0.03509	-0.05987
x12	x12	0.03597	0.89709	0.08089	-0.07422
x7	x7	-0.04523	0.88429	0.05179	-0.02111
x10	x10	0.04466	0.76008	-0.09752	0.10556
x8	x8	-0.05390	-0.01789	0.94815	0.01385
x14	x14	0.03174	0.05200	0.93419	0.01556
x6	x6	-0.14660	0.13519	-0.12712	0.94308
x11	x11	0.51241	-0.04715	0.04973	0.59386
x13	x13	0.01932	0.12844	-0.17072	-0.71306

Table 5. Communalities of variables in rotated factor matrix.

Variable x11 still has a cross-loading problem on factor 1 and factor 4. The ratio between the higher and the lower factor loading is 1.16 leading to a problematic cross-loading and thus elimination of the variable should be enforced.

The path diagram in Figure 2, displays the result for the four-factor solution and thus the underlying structure of the assessed variables in the HBAT data set.

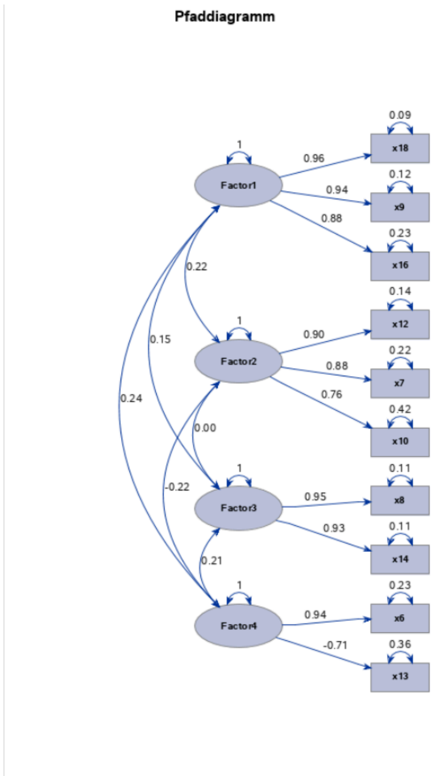


Figure 2. Path-diagram from analysis of HBAT variables x6-x18 excluding x15 and x17 and deleted x11.

The following category names can be assigned to the factors based on significant variable loadings:
Factor 1: Post-sale Customer Service: x9 complaint resolution, x18 delivery speed and x16 order and billing
Factor 1: Marketing, x12 salesforce image, x7, E-commerce presence and x10 advertising.
Factor 3: Technical Support: x8 technical support and x14 warranty and claims.
Factor 4: Product Value: x6 product quality and x13 competitive pricing.

SAS code used:

```
ods noproctitle;
ods graphics / imagemap=on;

proc factor data=WORK.IMPORT method=principal prerotate=obvarimax
rotate=promax
          nfactors=4 score reorder norm=kaiser plots
      (nplots=3)=(scree loadings);
       var x6 x7 x8 x9 x10 x11 x12 x13 x14 x16 x18;
       pathdiagram fuzz=0.6;
run;
```

The following reports document the two factor analyses performed.

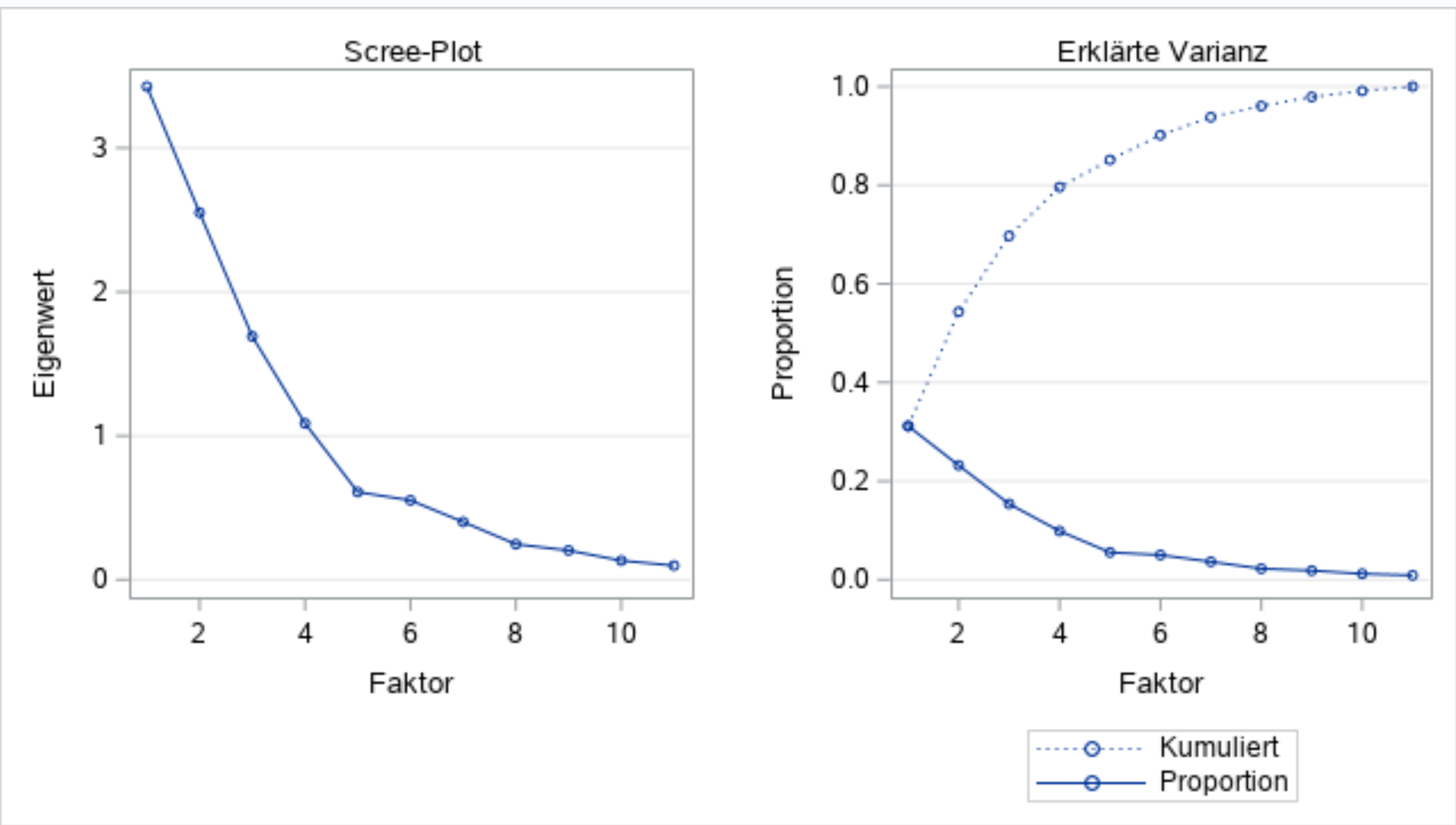
Einlesedatentyp	Rohdaten
Anzahl gelesener Datensätz	100
Anzahl verwendeter Datensä	100
N für Signifikanztests	100

Ursprgl. Faktormethode: Hauptkomponenten

Priori Kommunalitätsschätzwerte: ONE

Eigenwerte der Korrelationsmatrix: Gesamt = 11 Durchschn. = 1				
	Eigenwert	**Differenz**	**Proportion**	**Kumuliert**
1	3.42697133	0.87607462	0.3115	0.3115
2	2.55089671	0.85992024	0.2319	0.5434
3	1.69097648	0.60442042	0.1537	0.6972
4	1.08655606	0.47713196	0.0988	0.7959
5	0.60942409	0.05754032	0.0554	0.8513
6	0.55188378	0.15036563	0.0502	0.9015
7	0.40151815	0.15456660	0.0365	0.9380
8	0.24695154	0.04339828	0.0225	0.9605
9	0.20355327	0.07071169	0.0185	0.9790
10	0.13284158	0.03441456	0.0121	0.9911
11	0.09842702		0.0089	1.0000

11 Faktoren bleiben durch Kriterium NFACTOR erhalten.



Faktormuster												
		Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
x18	x18	0.87579	0.11667	-0.30250	-0.20569	-0.02766	-0.02214	0.14843	-0.03250	0.00987	0.04377	-0.24334
x9	x9	0.87133	0.03105	-0.27354	-0.21506	0.02237	0.02091	0.00539	-0.25513	-0.04207	-0.19487	0.11374
x16	x16	0.80938	0.04216	-0.21967	-0.24689	0.02089	0.08876	-0.41778	0.18189	0.04470	0.11075	0.06091
x11	x11	0.71598	-0.45484	-0.15121	0.21150	0.09108	-0.07295	0.38536	0.16558	0.03797	0.08558	0.12081
x12	x12	0.37703	0.75177	0.31384	0.23159	0.15954	-0.07798	-0.00091	-0.08404	-0.29096	0.12881	0.02657
x7	x7	0.30721	0.71314	0.30591	0.28392	0.32966	-0.19557	-0.03778	0.06064	0.24476	-0.10262	-0.01956
x13	x13	-0.28081	0.66035	-0.06898	-0.34768	0.19433	0.52725	0.19532	0.04911	0.04247	0.01647	0.03230
x8	x8	0.29192	-0.36889	0.79447	-0.20159	-0.01870	0.08080	0.01090	-0.23093	0.16210	0.14148	0.01629
x14	x14	0.39418	-0.30613	0.77836	-0.19316	-0.02570	0.10389	0.01942	0.22041	-0.14328	-0.15867	-0.04045
x6	x6	0.24767	-0.50070	-0.08098	0.67039	0.18085	0.41941	-0.12143	-0.06732	-0.01413	-0.02427	-0.05735
x10	x10	0.34013	0.58083	0.11456	0.33137	-0.62755	0.14900	0.03996	0.02658	0.06979	-0.01354	0.02547

Varianz erkärt nach jedem Faktor										
Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
3.4269713	2.5508967	1.6909765	1.0865561	0.6094241	0.5518838	0.4015181	0.2469515	0.2035533	0.1328416	0.0984270

Endgült. Kommunalität Schätzung: Gesamte = 11.000000										
x6	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**	**x14**	**x16**	**x18**
1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

Prärotationsmethode: Oblique Varimax

Oblike Transformationsmatrix											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1	0.25556	0.08965	0.08518	0.07227	0.09925	-0.08194	0.20893	0.23618	0.11002	0.11502	0.25426
2	0.04574	0.27957	-0.14461	-0.19629	0.22770	0.25887	-0.17831	0.01653	0.29471	-0.12001	0.01217
3	-0.17889	0.18091	0.46983	-0.04789	0.06775	-0.04079	-0.08942	-0.12991	0.18559	0.46030	-0.16176
4	-0.18931	0.26131	-0.18553	0.61699	0.30497	-0.31998	0.19465	-0.22722	0.21314	-0.17777	-0.19793
5	-0.04539	0.54094	-0.03069	0.29676	-1.02974	0.31887	0.14946	0.03427	0.26180	-0.04218	0.03671
6	-0.04011	-0.35437	0.14641	0.75997	0.26999	0.95537	-0.13218	0.16083	-0.14130	0.18824	0.03790
7	0.36966	-0.09410	0.02714	-0.30244	0.09953	0.48646	0.95975	-1.04050	-0.00227	0.04835	0.01341
8	-0.13159	0.24555	-0.93514	-0.27261	0.10761	0.19888	0.67051	0.73654	-0.34029	0.89254	-1.03311
9	0.04851	1.20246	0.79638	-0.06944	0.34285	0.20867	0.18653	0.21959	-1.42940	-0.70387	-0.20668
10	0.32953	-0.77250	1.06502	-0.18272	-0.10195	0.12397	0.64421	0.83371	0.96965	-1.19445	-1.46697
11	-2.47229	-0.19870	0.16552	-0.58264	0.25878	0.32817	1.22741	0.61884	0.26997	-0.41097	1.15556

Inter-Faktor-Korrelationen											
	Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
Factor1	1.00000	0.19164	0.02544	0.02772	0.27586	-0.07287	0.60185	0.75100	0.27155	0.10939	0.86509
Factor2	0.19164	1.00000	0.00087	-0.13716	0.42989	0.22946	-0.05269	0.15615	0.79154	0.05190	0.14018
Factor3	0.02544	0.00087	1.00000	0.09560	-0.06287	-0.27079	0.19263	0.08010	0.01699	0.79717	0.09666
Factor4	0.02772	-0.13716	0.09560	1.00000	-0.05347	-0.40128	0.47749	0.10430	-0.15181	0.08831	0.10637
Factor5	0.27586	0.42989	-0.06287	-0.05347	1.00000	0.13422	-0.01155	0.18424	0.54220	0.01079	0.19692
Factor6	-0.07287	0.22946	-0.27079	-0.40128	0.13422	1.00000	-0.49495	-0.11457	0.26460	-0.24499	-0.12795
Factor7	0.60185	-0.05269	0.19263	0.47749	-0.01155	-0.49495	1.00000	0.42441	-0.06132	0.27308	0.56142
Factor8	0.75100	0.15615	0.08010	0.10430	0.18424	-0.11457	0.42441	1.00000	0.19513	0.19707	0.75687
Factor9	0.27155	0.79154	0.01699	-0.15181	0.54220	0.26460	-0.06132	0.19513	1.00000	0.10746	0.22975
Factor10	0.10939	0.05190	0.79717	0.08831	0.01079	-0.24499	0.27308	0.19707	0.10746	1.00000	0.14041
Factor11	0.86509	0.14018	0.09666	0.10637	0.19692	-0.12795	0.56142	0.75687	0.22975	0.14041	1.00000

Rotiertes Faktormuster (Standardisierte Regressionskoeffizienten)												
		Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
x18	x18	1.00000	0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
x7	x7	-0.00000	1.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x8	x8	-0.00000	-0.00000	1.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000
x6	x6	0.00000	-0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x10	x10	-0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000
x13	x13	-0.00000	-0.00000	0.00000	0.00000	-0.00000	1.00000	-0.00000	-0.00000	0.00000	0.00000	-0.00000
x11	x11	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	0.00000
x16	x16	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000	0.00000	0.00000	1.00000	0.00000	0.00000	-0.00000
x12	x12	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	1.00000	-0.00000	0.00000
x14	x14	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	1.00000	0.00000
x9	x9	-0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	1.00000

Referenzachsenkorrelationen											
	Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
Factor1	1.00000	0.04045	0.01707	0.35477	-0.20164	-0.18405	-0.52936	-0.36944	-0.08692	0.10039	-0.55488

Factor2	0.04045	1.00000	-0.06806	0.06137	-0.01547	-0.04665	-0.10050	-0.11302	-0.72474	0.09991	0.09742
Factor3	0.01707	-0.06806	1.00000	-0.04526	0.06194	0.13853	0.11741	0.15973	0.07591	-0.78714	-0.15567
Factor4	0.35477	0.06137	-0.04526	1.00000	-0.10719	0.08486	-0.50256	-0.18448	-0.04163	0.12211	-0.06183
Factor5	-0.20164	-0.01547	0.06194	-0.10719	1.00000	0.05965	0.14272	0.03983	-0.31080	-0.03174	0.07374
Factor6	-0.18405	-0.04665	0.13853	0.08486	0.05965	1.00000	0.38577	0.10102	-0.09204	-0.02833	0.01994
Factor7	-0.52936	-0.10050	0.11741	-0.50256	0.14272	0.38577	1.00000	0.26099	0.14787	-0.24605	-0.05360
Factor8	-0.36944	-0.11302	0.15973	-0.18448	0.03983	0.10102	0.26099	1.00000	0.11326	-0.25041	-0.32236
Factor9	-0.08692	-0.72474	0.07591	-0.04163	-0.31080	-0.09204	0.14787	0.11326	1.00000	-0.17478	-0.12394
Factor10	0.10039	0.09991	-0.78714	0.12211	-0.03174	-0.02833	-0.24605	-0.25041	-0.17478	1.00000	0.12738
Factor11	-0.55488	0.09742	-0.15567	-0.06183	0.07374	0.01994	-0.05360	-0.32236	-0.12394	0.12738	1.00000

Referenzstruktur (Semipartielle Korrelationen)

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
x18	x18	0.39175	0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
x7	x7	-0.00000	0.60229	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x8	x8	-0.00000	-0.00000	0.57960	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000
x6	x6	0.00000	-0.00000	-0.00000	0.78187	0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x10	x10	-0.00000	0.00000	0.00000	0.00000	0.81408	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000
x13	x13	-0.00000	-0.00000	0.00000	0.00000	-0.00000	0.78206	-0.00000	-0.00000	0.00000	0.00000	-0.00000
x11	x11	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	0.53543	0.00000	0.00000	-0.00000	0.00000
x16	x16	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000	0.00000	0.00000	0.58692	0.00000	0.00000	-0.00000
x12	x12	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	0.53921	-0.00000	0.00000
x14	x14	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	0.55916	0.00000
x9	x9	-0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.45978

Varianz erklärt nach jedem Faktor, andere Faktoren werden eliminiert

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
0.15346807	0.36275335	0.33593168	0.61132283	0.66271980	0.61162074	0.28668202	0.34447131	0.29074669	0.31266247	0.21139646

Faktorstruktur (Korrelationen)

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
x18	x18	1.00000	0.19164	0.02544	0.02772	0.27586	-0.07287	0.60185	0.75100	0.27155	0.10939	0.86509
x7	x7	0.19164	1.00000	0.00087	-0.13716	0.42989	0.22946	-0.05269	0.15615	0.79154	0.05190	0.14018
x8	x8	0.02544	0.00087	1.00000	0.09560	-0.06287	-0.27079	0.19263	0.08010	0.01699	0.79717	0.09666
x6	x6	0.02772	-0.13716	0.09560	1.00000	-0.05347	-0.40128	0.47749	0.10430	-0.15181	0.08831	0.10637
x10	x10	0.27586	0.42989	-0.06287	-0.05347	1.00000	0.13422	-0.01155	0.18424	0.54220	0.01079	0.19692
x13	x13	-0.07287	0.22946	-0.27079	-0.40128	0.13422	1.00000	-0.49495	-0.11457	0.26460	-0.24499	-0.12795
x11	x11	0.60185	-0.05269	0.19263	0.47749	-0.01155	-0.49495	1.00000	0.42441	-0.06132	0.27308	0.56142
x16	x16	0.75100	0.15615	0.08010	0.10430	0.18424	-0.11457	0.42441	1.00000	0.19513	0.19707	0.75687
x12	x12	0.27155	0.79154	0.01699	-0.15181	0.54220	0.26460	-0.06132	0.19513	1.00000	0.10746	0.22975
x14	x14	0.10939	0.05190	0.79717	0.08831	0.01079	-0.24499	0.27308	0.19707	0.10746	1.00000	0.14041
x9	x9	0.86509	0.14018	0.09666	0.10637	0.19692	-0.12795	0.56142	0.75687	0.22975	0.14041	1.00000

Varianz erklärt nach jedem Faktor, andere Faktoren werden ignoriert

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
2.8798708	1.9690410	1.7756942	1.4736479	1.6526864	1.7148314	2.4488538	2.4826332	2.1937803	1.8627381	2.8043789

Endgült. Kommunalität Schätzung: Gesamte = 11.000000

x6	x7	x8	x9	x10	x11	x12	x13	x14	x16	x18
1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

Prärotationsmethode: Oblique Varimax

Scoring-Koeffizienten geschätzt nach Regression

Quadratische multiple Korrelationen der Variablen bei jedem Faktor

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11

1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

Standardisierte Scoring-Koeffizienten

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
x18	x18	1.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000
x7	x7	-0.00000	1.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	0.00000
x8	x8	-0.00000	0.00000	1.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000
x6	x6	-0.00000	0.00000	-0.00000	1.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000
x10	x10	-0.00000	-0.00000	0.00000	0.00000	1.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.00000
x13	x13	0.00000	-0.00000	0.00000	0.00000	-0.00000	1.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000
x11	x11	-0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	1.00000	0.00000	-0.00000	0.00000	0.00000
x16	x16	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	1.00000	0.00000	0.00000	0.00000
x12	x12	-0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	1.00000	0.00000	-0.00000
x14	x14	-0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	1.00000	-0.00000
x9	x9	-0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.00000	1.00000

Rotationsmethode: Promax (Potenz = 3)

Zielmatrix für Procrustes-Transformation

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
x18	x18	1.00000	0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
x7	x7	-0.00000	1.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x8	x8	-0.00000	-0.00000	1.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000
x6	x6	0.00000	-0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x10	x10	-0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000
x13	x13	-0.00000	-0.00000	0.00000	0.00000	-0.00000	1.00000	-0.00000	-0.00000	0.00000	0.00000	-0.00000
x11	x11	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	0.00000
x16	x16	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000	0.00000	0.00000	1.00000	0.00000	0.00000	-0.00000
x12	x12	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	1.00000	-0.00000	0.00000
x14	x14	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	1.00000	0.00000
x9	x9	-0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	1.00000

Procrustes-Transformationsmatrix

	1	2	3	4	5	6	7	8	9	10	11
1	1.00000	-0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000
2	0.00000	1.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000
3	0.00000	0.00000	1.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000
4	-0.00000	0.00000	0.00000	1.00000	-0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000
5	0.00000	-0.00000	-0.00000	-0.00000	1.00000	-0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000
6	0.00000	0.00000	-0.00000	-0.00000	0.00000	1.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000
7	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	1.00000	-0.00000	-0.00000	0.00000	-0.00000
8	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00000	-0.00000	1.00000	-0.00000	-0.00000	0.00000
9	-0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	-0.00000	1.00000	0.00000	-0.00000
10	-0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	1.00000	-0.00000
11	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000	1.00000

Normalisierte oblike Transformationsmatrix

	1	2	3	4	5	6	7	8	9	10	11
1	0.25556	0.08965	0.08518	0.07227	0.09925	-0.08194	0.20893	0.23618	0.11002	0.11502	0.25426
2	0.04574	0.27957	-0.14461	-0.19629	0.22770	0.25887	-0.17831	0.01653	0.29471	-0.12001	0.01217
3	-0.17889	0.18091	0.46983	-0.04789	0.06775	-0.04079	-0.08942	-0.12991	0.18559	0.46030	-0.16176
4	-0.18931	0.26131	-0.18553	0.61699	0.30497	-0.31998	0.19465	-0.22722	0.21314	-0.17777	-0.19793
5	-0.04539	0.54094	-0.03069	0.29676	-1.02974	0.31887	0.14946	0.03427	0.26180	-0.04218	0.03671
6	-0.04011	-0.35437	0.14641	0.75997	0.26999	0.95537	-0.13218	0.16083	-0.14130	0.18824	0.03790
7	0.36966	-0.09410	0.02714	-0.30244	0.09953	0.48646	0.95975	-1.04050	-0.00227	0.04835	0.01341
8	-0.13159	0.24555	-0.93514	-0.27261	0.10761	0.19888	0.67051	0.73654	-0.34029	0.89254	-1.03311

9	0.04851	1.20246	0.79638	-0.06944	0.34285	0.20867	0.18653	0.21959	-1.42940	-0.70387	-0.20668
10	0.32953	-0.77250	1.06502	-0.18272	-0.10195	0.12397	0.64421	0.83371	0.96965	-1.19445	-1.46697
11	-2.47229	-0.19870	0.16552	-0.58264	0.25878	0.32817	1.22741	0.61884	0.26997	-0.41097	1.15556

Inter-Faktor-Korrelationen

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
Factor1	1.00000	0.19164	0.02544	0.02772	0.27586	-0.07287	0.60185	0.75100	0.27155	0.10939	0.86509
Factor2	0.19164	1.00000	0.00087	-0.13716	0.42989	0.22946	-0.05269	0.15615	0.79154	0.05190	0.14018
Factor3	0.02544	0.00087	1.00000	0.09560	-0.06287	-0.27079	0.19263	0.08010	0.01699	0.79717	0.09666
Factor4	0.02772	-0.13716	0.09560	1.00000	-0.05347	-0.40128	0.47749	0.10430	-0.15181	0.08831	0.10637
Factor5	0.27586	0.42989	-0.06287	-0.05347	1.00000	0.13422	-0.01155	0.18424	0.54220	0.01079	0.19692
Factor6	-0.07287	0.22946	-0.27079	-0.40128	0.13422	1.00000	-0.49495	-0.11457	0.26460	-0.24499	-0.12795
Factor7	0.60185	-0.05269	0.19263	0.47749	-0.01155	-0.49495	1.00000	0.42441	-0.06132	0.27308	0.56142
Factor8	0.75100	0.15615	0.08010	0.10430	0.18424	-0.11457	0.42441	1.00000	0.19513	0.19707	0.75687
Factor9	0.27155	0.79154	0.01699	-0.15181	0.54220	0.26460	-0.06132	0.19513	1.00000	0.10746	0.22975
Factor10	0.10939	0.05190	0.79717	0.08831	0.01079	-0.24499	0.27308	0.19707	0.10746	1.00000	0.14041
Factor11	0.86509	0.14018	0.09666	0.10637	0.19692	-0.12795	0.56142	0.75687	0.22975	0.14041	1.00000

Rotiertes Faktormuster (Standardisierte Regressionskoeffizienten)

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
x18	x18	1.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000
x7	x7	-0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000
x8	x8	-0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000
x6	x6	-0.00000	-0.00000	-0.00000	1.00000	-0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000
x10	x10	-0.00000	0.00000	0.00000	-0.00000	1.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000
x13	x13	0.00000	0.00000	-0.00000	-0.00000	-0.00000	1.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000
x11	x11	-0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000
x16	x16	-0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	1.00000	-0.00000	-0.00000	0.00000
x12	x12	-0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	1.00000	-0.00000	-0.00000
x14	x14	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000	0.00000	1.00000	-0.00000
x9	x9	-0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	1.00000

Referenzachsenkorrelationen

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
Factor1	1.00000	0.04045	0.01707	0.35477	-0.20164	-0.18405	-0.52936	-0.36944	-0.08692	0.10039	-0.55488
Factor2	0.04045	1.00000	-0.06806	0.06137	-0.01547	-0.04665	-0.10050	-0.11302	-0.72474	0.09991	0.09742
Factor3	0.01707	-0.06806	1.00000	-0.04526	0.06194	0.13853	0.11741	0.15973	0.07591	-0.78714	-0.15567
Factor4	0.35477	0.06137	-0.04526	1.00000	-0.10719	0.08486	-0.50256	-0.18448	-0.04163	0.12211	-0.06183
Factor5	-0.20164	-0.01547	0.06194	-0.10719	1.00000	0.05965	0.14272	0.03983	-0.31080	-0.03174	0.07374
Factor6	-0.18405	-0.04665	0.13853	0.08486	0.05965	1.00000	0.38577	0.10102	-0.09204	-0.02833	0.01994
Factor7	-0.52936	-0.10050	0.11741	-0.50256	0.14272	0.38577	1.00000	0.26099	0.14787	-0.24605	-0.05360
Factor8	-0.36944	-0.11302	0.15973	-0.18448	0.03983	0.10102	0.26099	1.00000	0.11326	-0.25041	-0.32236
Factor9	-0.08692	-0.72474	0.07591	-0.04163	-0.31080	-0.09204	0.14787	0.11326	1.00000	-0.17478	-0.12394
Factor10	0.10039	0.09991	-0.78714	0.12211	-0.03174	-0.02833	-0.24605	-0.25041	-0.17478	1.00000	0.12738
Factor11	-0.55488	0.09742	-0.15567	-0.06183	0.07374	0.01994	-0.05360	-0.32236	-0.12394	0.12738	1.00000

Referenzstruktur (Semipartielle Korrelationen)

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
x18	x18	0.39175	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000
x7	x7	-0.00000	0.60229	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000
x8	x8	-0.00000	-0.00000	0.57960	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000
x6	x6	-0.00000	-0.00000	-0.00000	0.78187	-0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000
x10	x10	-0.00000	0.00000	0.00000	-0.00000	0.81408	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000
x13	x13	0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.78206	-0.00000	0.00000	-0.00000	0.00000	0.00000
x11	x11	-0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.53543	0.00000	0.00000	0.00000	0.00000
x16	x16	-0.00000	0.00000	-0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.58692	-0.00000	-0.00000	0.00000
x12	x12	-0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	0.53921	-0.00000	-0.00000

x14	x14	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000	0.00000	0.55916	-0.00000
x9	x9	-0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	0.45978

Varianz erklärt nach jedem Faktor, andere Faktoren werden eliminiert										
Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
0.15346807	0.36275335	0.33593168	0.61132283	0.66271980	0.61162074	0.28668202	0.34447131	0.29074669	0.31266247	0.21139646

Faktorstruktur (Korrelationen)												
		Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
x18	x18	1.00000	0.19164	0.02544	0.02772	0.27586	-0.07287	0.60185	0.75100	0.27155	0.10939	0.86509
x7	x7	0.19164	1.00000	0.00087	-0.13716	0.42989	0.22946	-0.05269	0.15615	0.79154	0.05190	0.14018
x8	x8	0.02544	0.00087	1.00000	0.09560	-0.06287	-0.27079	0.19263	0.08010	0.01699	0.79717	0.09666
x6	x6	0.02772	-0.13716	0.09560	1.00000	-0.05347	-0.40128	0.47749	0.10430	-0.15181	0.08831	0.10637
x10	x10	0.27586	0.42989	-0.06287	-0.05347	1.00000	0.13422	-0.01155	0.18424	0.54220	0.01079	0.19692
x13	x13	-0.07287	0.22946	-0.27079	-0.40128	0.13422	1.00000	-0.49495	-0.11457	0.26460	-0.24499	-0.12795
x11	x11	0.60185	-0.05269	0.19263	0.47749	-0.01155	-0.49495	1.00000	0.42441	-0.06132	0.27308	0.56142
x16	x16	0.75100	0.15615	0.08010	0.10430	0.18424	-0.11457	0.42441	1.00000	0.19513	0.19707	0.75687
x12	x12	0.27155	0.79154	0.01699	-0.15181	0.54220	0.26460	-0.06132	0.19513	1.00000	0.10746	0.22975
x14	x14	0.10939	0.05190	0.79717	0.08831	0.01079	-0.24499	0.27308	0.19707	0.10746	1.00000	0.14041
x9	x9	0.86509	0.14018	0.09666	0.10637	0.19692	-0.12795	0.56142	0.75687	0.22975	0.14041	1.00000

Varianz erklärt nach jedem Faktor, andere Faktoren werden ignoriert										
Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
2.8798708	1.9690410	1.7756942	1.4736479	1.6526864	1.7148314	2.4488538	2.4826332	2.1937803	1.8627381	2.8043789

Endgült. Kommunalität Schätzung: Gesamte = 11.000000										
x6	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**	**x14**	**x16**	**x18**
1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

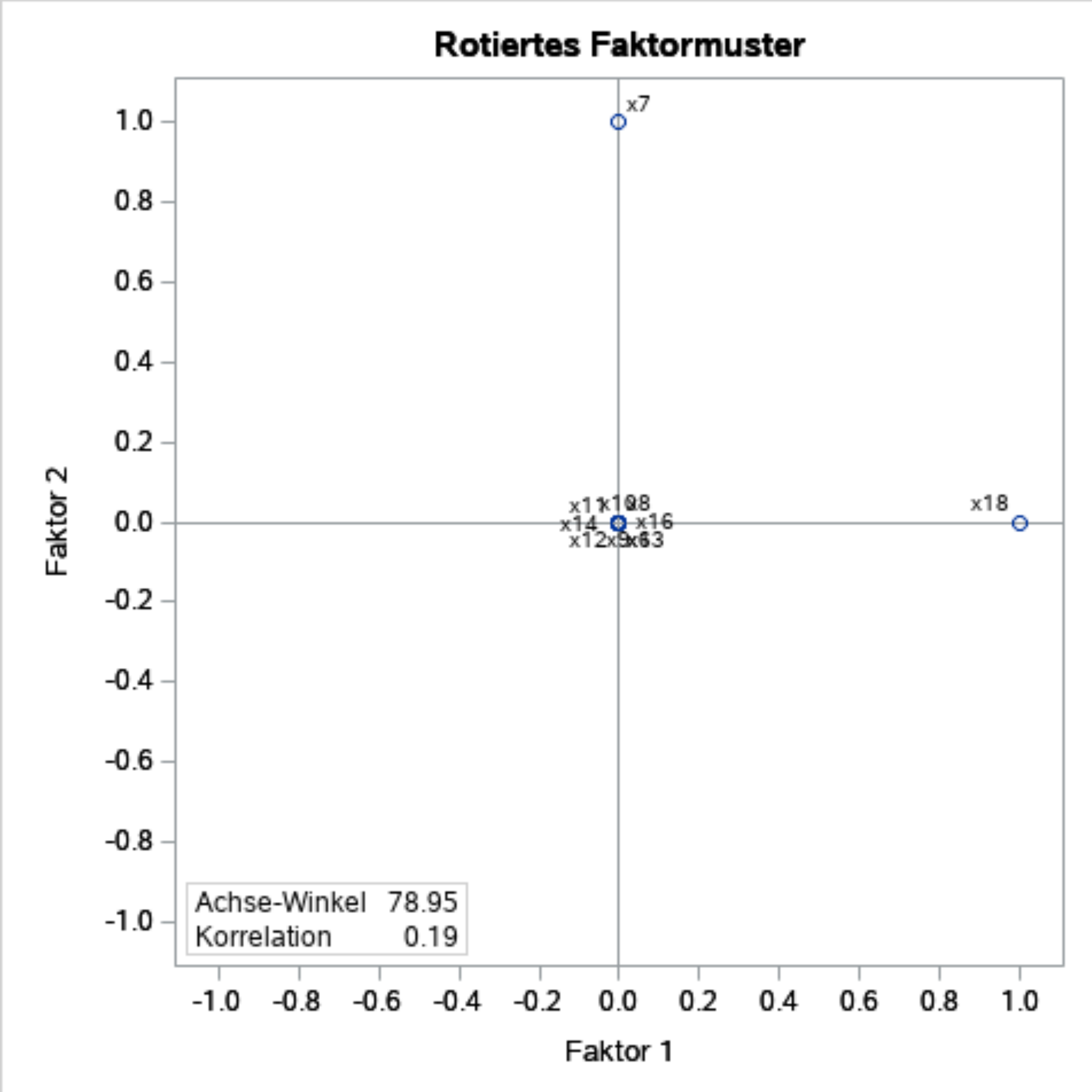
Rotationsmethode: Promax (Potenz = 3)

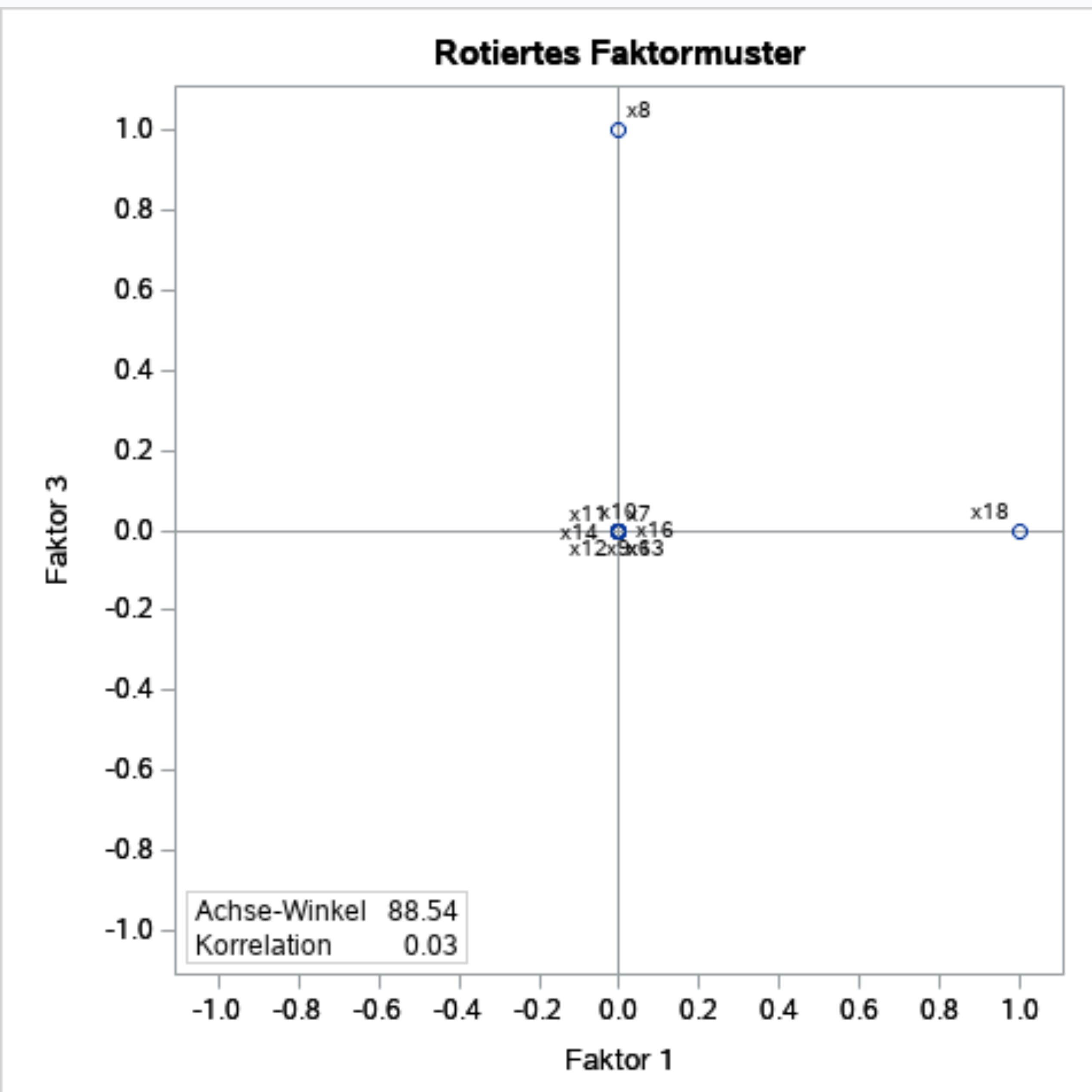
Scoring-Koeffizienten geschätzt nach Regression

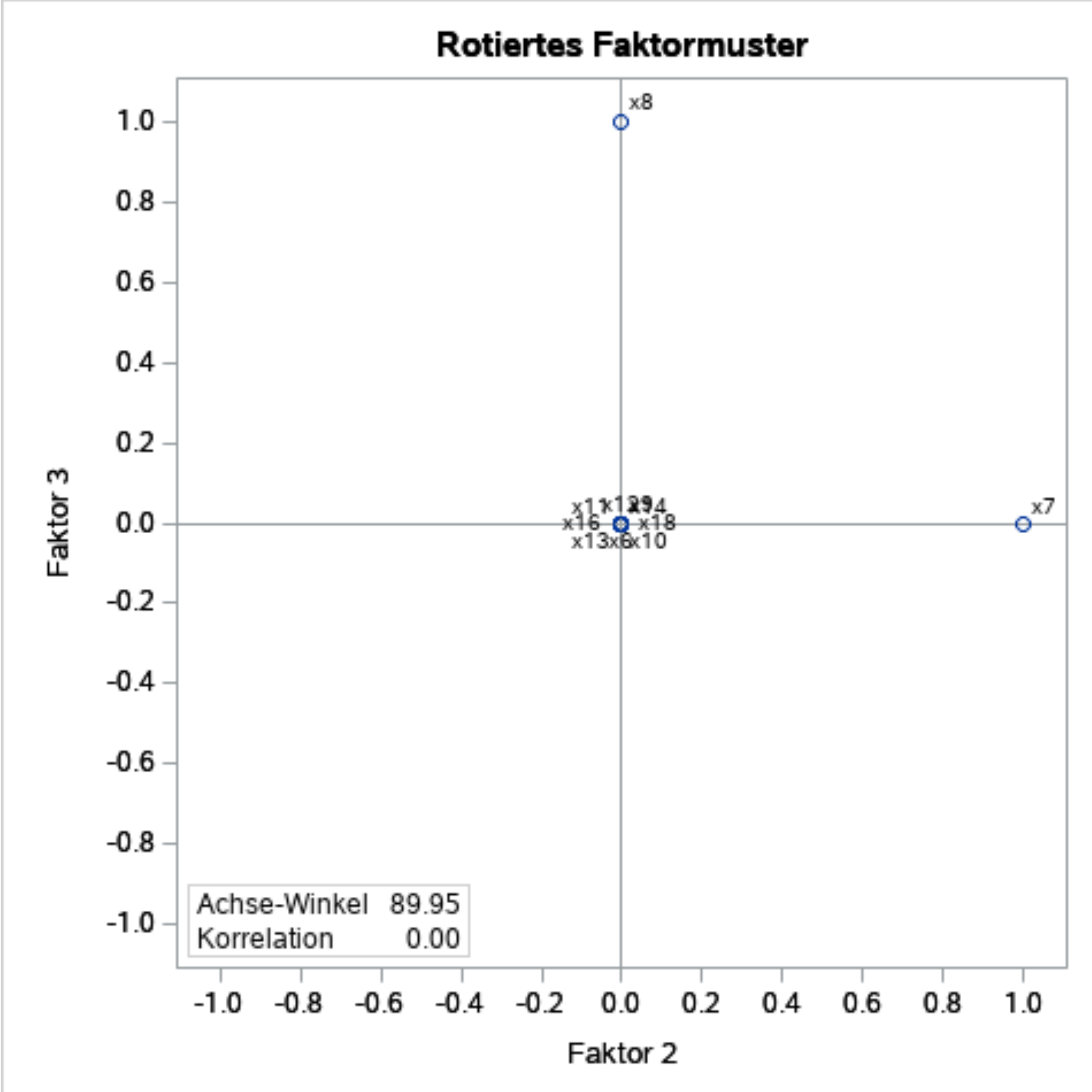
Quadratische multiple Korrelationen der Variablen bei jedem Faktor										
Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

Standardisierte Scoring-Koeffizienten												
		Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor6**	**Factor7**	**Factor8**	**Factor9**	**Factor10**	**Factor11**
x18	x18	1.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	-0.00000
x7	x7	-0.00000	1.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	0.00000
x8	x8	0.00000	0.00000	1.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000
x6	x6	-0.00000	0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	-0.00000	-0.00000
x10	x10	0.00000	-0.00000	0.00000	0.00000	1.00000	-0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
x13	x13	0.00000	-0.00000	0.00000	0.00000	-0.00000	1.00000	0.00000	0.00000	-0.00000	0.00000	0.00000
x11	x11	0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	1.00000	0.00000	-0.00000	0.00000	0.00000
x16	x16	0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	1.00000	-0.00000	0.00000	0.00000
x12	x12	0.00000	0.00000	-0.00000	0.00000	0.00000	-0.00000	0.00000	-0.00000	1.00000	0.00000	-0.00000
x14	x14	-0.00000	-0.00000	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	1.00000	-0.00000
x9	x9	-0.00000	-0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000	0.00000	1.00000

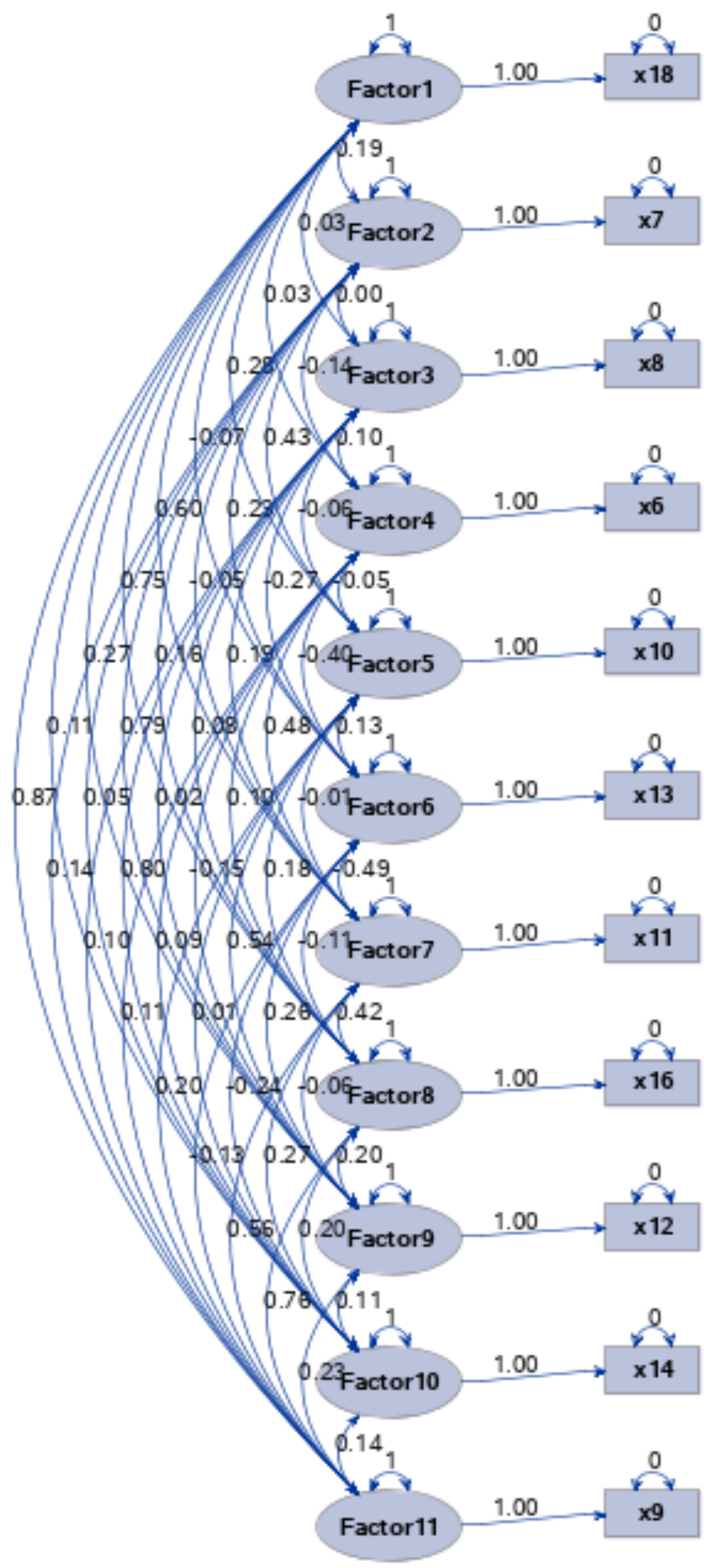
Rotationsmethode: Promax (Potenz = 3)


Rotiertes Faktormuster
Faktor 2
Faktor 1
x7
x18
x14
x16
Achse-Winkel 78.95
Korrelation 0.19


Rotiertes Faktormuster
Faktor 3
Faktor 1
x8
x18
x14
x16
Achse-Winkel 88.54
Korrelation 0.03


Rotiertes Faktormuster
Faktor 3
Faktor 2
x8
x7
Achse-Winkel 89.95
Korrelation 0.00

Pfaddiagramm



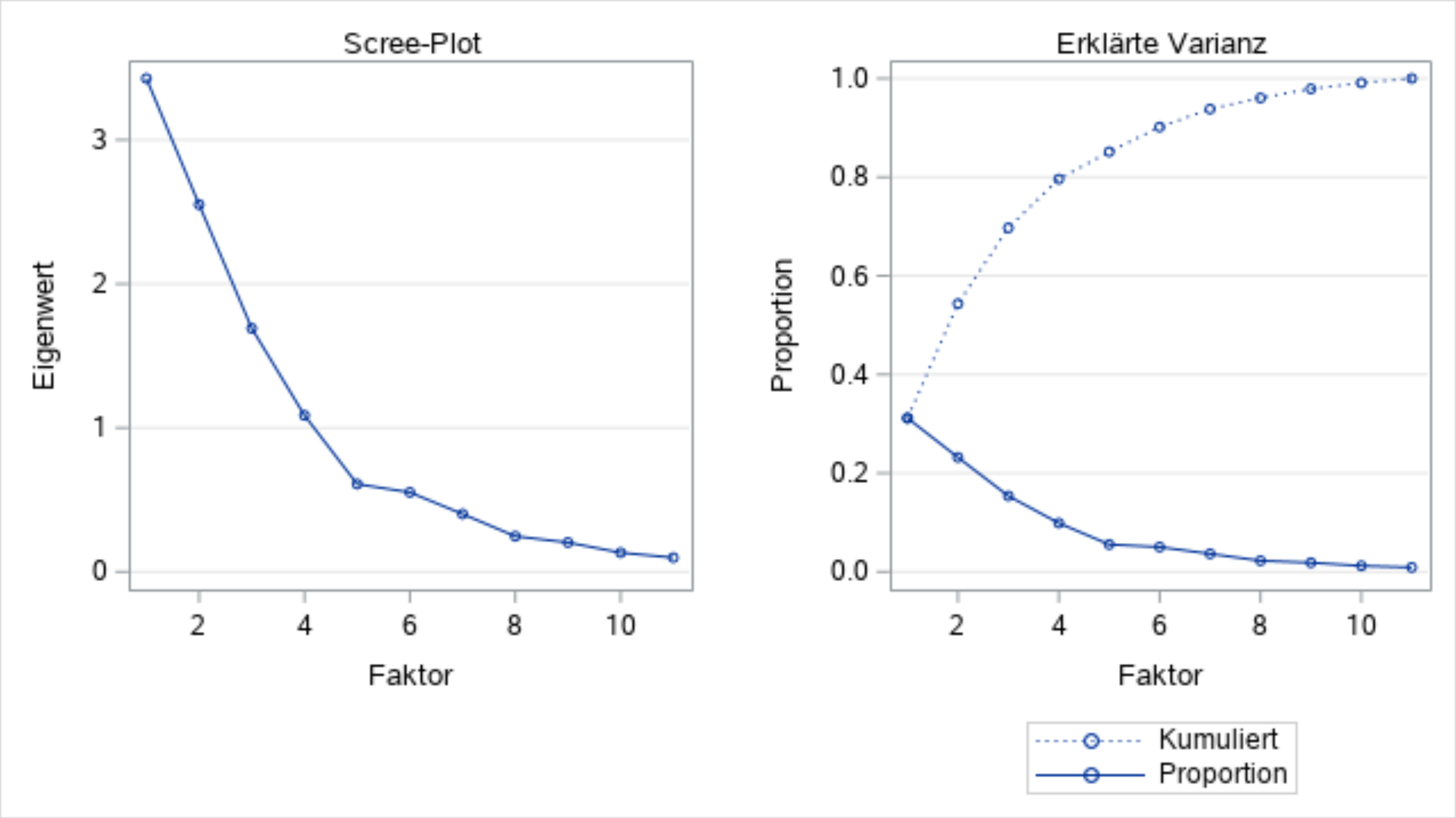
Einlesedatentyp	Rohdaten
Anzahl gelesener Datensätz	100
Anzahl verwendeter Datensä	100
N für Signifikanztests	100

Ursprgl. Faktormethode: Hauptkomponenten

Priori Kommunalitätsschätzwerte: ONE

Eigenwerte der Korrelationsmatrix: Gesamt = 11 Durchschn. = 1				
	Eigenwert	**Differenz**	**Proportion**	**Kumuliert**
1	3.42697133	0.87607462	0.3115	0.3115
2	2.55089671	0.85992024	0.2319	0.5434
3	1.69097648	0.60442042	0.1537	0.6972
4	1.08655606	0.47713196	0.0988	0.7959
5	0.60942409	0.05754032	0.0554	0.8513
6	0.55188378	0.15036563	0.0502	0.9015
7	0.40151815	0.15456660	0.0365	0.9380
8	0.24695154	0.04339828	0.0225	0.9605
9	0.20355327	0.07071169	0.0185	0.9790
10	0.13284158	0.03441456	0.0121	0.9911
11	0.09842702		0.0089	1.0000

4 Faktoren bleiben durch Kriterium NFACTOR erhalten.



Faktormuster					
		Factor1	**Factor2**	**Factor3**	**Factor4**
x18	x18	0.87579	0.11667	-0.30250	-0.20569
x9	x9	0.87133	0.03105	-0.27354	-0.21506
x16	x16	0.80938	0.04216	-0.21967	-0.24689
x11	x11	0.71598	-0.45484	-0.15121	0.21150
x12	x12	0.37703	0.75177	0.31384	0.23159
x7	x7	0.30721	0.71314	0.30591	0.28392
x13	x13	-0.28081	0.66035	-0.06898	-0.34768
x10	x10	0.34013	0.58083	0.11456	0.33137
x8	x8	0.29192	-0.36889	0.79447	-0.20159
x14	x14	0.39418	-0.30613	0.77836	-0.19316
x6	x6	0.24767	-0.50070	-0.08098	0.67039

Varianz erkärt nach jedem Faktor			
Factor1	**Factor2**	**Factor3**	**Factor4**
3.4269713	2.5508967	1.6909765	1.0865561

Endgült. Kommunalität Schätzung: Gesamte = 8.755401										
x6	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**	**x14**	**x16**	**x18**
0.76802937	0.77714736	0.89311235	0.88126008	0.57597858	0.78710502	0.85944643	0.64055781	0.89224653	0.76608666	0.91443037

Prärotationsmethode: Oblique Varimax

Oblike Transformationsmatrix				
	1	**2**	**3**	**4**
1	0.79004	0.27895	0.23058	0.23981
2	0.02046	0.71247	-0.27666	-0.49538
3	-0.47125	0.36443	0.89966	-0.08347
4	-0.49814	0.60024	-0.31701	0.89290

Inter-Faktor-Korrelationen				
	Factor1	**Factor2**	**Factor3**	**Factor4**
Factor1	1.00000	0.18031	0.11491	0.18571
Factor2	0.18031	1.00000	-0.01519	-0.16369
Factor3	0.11491	-0.01519	1.00000	0.17624
Factor4	0.18571	-0.16369	0.17624	1.00000

Rotiertes Faktormuster (Standardisierte Regressionskoeffizienten)					
		Factor1	**Factor2**	**Factor3**	**Factor4**
x18	x18	0.93931	0.09372	-0.03728	-0.00619
x9	x9	0.92506	0.03641	0.01441	0.02437
x16	x16	0.86681	0.02757	0.05560	-0.02890
x12	x12	0.04999	0.89417	0.08788	-0.10140
x7	x7	-0.02830	0.87569	0.05875	-0.05162
x10	x10	0.06155	0.74935	-0.08424	0.08015
x8	x8	-0.05089	-0.01287	0.94802	0.00643
x14	x14	0.03458	0.05956	0.93707	0.00874
x6	x6	-0.11036	0.08524	-0.08974	0.91278
x11	x11	0.52225	-0.05249	0.08785	0.59849
x13	x13	-0.00264	0.15832	-0.19928	-0.69915

Referenzachsenkorrelationen				
	Factor1	**Factor2**	**Factor3**	**Factor4**
Factor1	1.00000	-0.21699	-0.08393	-0.20539
Factor2	-0.21699	1.00000	0.00452	0.20086
Factor3	-0.08393	0.00452	1.00000	-0.15455
Factor4	-0.20539	0.20086	-0.15455	1.00000

Referenzstruktur (Semipartielle Korrelationen)					
		Factor1	**Factor2**	**Factor3**	**Factor4**
x18	x18	0.89772	0.09025	-0.03656	-0.00588
x9	x9	0.88410	0.03506	0.01414	0.02316
x16	x16	0.82843	0.02655	0.05453	-0.02747
x12	x12	0.04778	0.86101	0.08619	-0.09637
x7	x7	-0.02704	0.84322	0.05762	-0.04906
x10	x10	0.05882	0.72156	-0.08262	0.07618
x8	x8	-0.04863	-0.01239	0.92980	0.00611
x14	x14	0.03305	0.05736	0.91906	0.00831

x6	x6	-0.10548	0.08207	-0.08801	0.86749
x11	x11	0.49913	-0.05054	0.08616	0.56879
x13	x13	-0.00252	0.15245	-0.19545	-0.66446

Varianz erklärt nach jedem Faktor, andere Faktoren werden eliminiert			
Factor1	**Factor2**	**Factor3**	**Factor4**
2.5440254	2.0190435	1.7846469	1.5364991

Faktorstruktur (Korrelationen)					
		Factor1	**Factor2**	**Factor3**	**Factor4**
x18	x18	0.95077	0.26467	0.06815	0.14634
x9	x9	0.93780	0.19900	0.12446	0.19274
x16	x16	0.87280	0.18775	0.14970	0.13736
x12	x12	0.20249	0.91845	0.06218	-0.22300
x7	x7	0.12677	0.87815	0.03310	-0.18987
x10	x10	0.20187	0.74860	-0.07442	-0.04593
x8	x8	0.05693	-0.03749	0.94350	0.16617
x14	x14	0.15462	0.05014	0.94168	0.17056
x6	x6	0.06421	-0.08272	0.05716	0.86252
x11	x11	0.63402	-0.05762	0.25414	0.71955
x13	x13	-0.12683	0.27532	-0.32521	-0.76068

Varianz erklärt nach jedem Faktor, andere Faktoren werden ignoriert			
Factor1	**Factor2**	**Factor3**	**Factor4**
3.0924029	2.4098870	2.0036148	2.0623385

Endgült. Kommunalität Schätzung: Gesamte = 8.755401										
x6	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**	**x14**	**x16**	**x18**
0.76802937	0.77714736	0.89311235	0.88126008	0.57597858	0.78710502	0.85944643	0.64055781	0.89224653	0.76608666	0.91443037

Prärotationsmethode: Oblique Varimax

Scoring-Koeffizienten geschätzt nach Regression

Quadratische multiple Korrelationen der Variablen bei jedem Faktor			
Factor1	**Factor2**	**Factor3**	**Factor4**
1.0000000	1.0000000	1.0000000	1.0000000

Standardisierte Scoring-Koeffizienten					
		Factor1	**Factor2**	**Factor3**	**Factor4**
x18	x18	0.34020	0.01356	-0.03003	-0.04200
x9	x9	0.33498	-0.01222	-0.00192	-0.02725
x16	x16	0.31612	-0.01749	0.02287	-0.05824
x12	x12	-0.00681	0.40838	0.03477	-0.02727
x7	x7	-0.03681	0.40500	0.01834	0.00637
x10	x10	-0.00479	0.35155	-0.06214	0.08049
x8	x8	-0.02691	-0.02082	0.51413	-0.02627
x14	x14	0.00191	0.01040	0.50608	-0.02534
x6	x6	-0.08459	0.08438	-0.07988	0.55871
x11	x11	0.16362	-0.01694	0.02371	0.32909
x13	x13	0.02815	0.04695	-0.08721	-0.40518

Rotationsmethode: Promax (Potenz = 3)

Zielmatrix für Procrustes-Transformation					
		Factor1	**Factor2**	**Factor3**	**Factor4**
x18	x18	0.98655	0.00099	-0.00006	-0.00000

x9	x9	1.00000	0.00006	0.00000	0.00002
x16	x16	0.99441	0.00003	0.00026	-0.00004
x12	x12	0.00017	0.97578	0.00092	-0.00147
x7	x7	-0.00003	1.00000	0.00030	-0.00021
x10	x10	0.00053	0.96844	-0.00136	0.00123
x8	x8	-0.00015	-0.00000	1.00000	0.00000
x14	x14	0.00005	0.00026	0.99646	0.00000
x6	x6	-0.00169	0.00079	-0.00091	1.00000
x11	x11	0.27832	-0.00029	0.00133	0.43815
x13	x13	-0.00000	0.00977	-0.01930	-0.87111

Procrustes-Transformationsmatrix

	1	2	3	4
1	1.03065	-0.04757	-0.02520	-0.03742
2	-0.02085	1.14449	-0.01146	0.03580
3	-0.00215	-0.00873	1.02033	0.00634
4	-0.03591	0.05404	-0.04392	1.05600

Normalisierte oblike Transformationsmatrix

	1	2	3	4
1	0.79121	0.25870	0.19741	0.22848
2	0.02437	0.69848	-0.26356	-0.48599
3	-0.48723	0.37761	0.90984	-0.05029
4	-0.55165	0.67337	-0.34951	0.95329

Inter-Faktor-Korrelationen

	Factor1	Factor2	Factor3	Factor4
Factor1	1.00000	0.22206	0.14681	0.23887
Factor2	0.22206	1.00000	0.00106	-0.22384
Factor3	0.14681	0.00106	1.00000	0.21188
Factor4	0.23887	-0.22384	0.21188	1.00000

Rotiertes Faktormuster (Standardisierte Regressionskoeffizienten)

		Factor1	Factor2	Factor3	Factor4
x18	x18	0.95663	0.05532	-0.06120	-0.03747
x9	x9	0.94208	-0.00101	-0.00989	-0.00727
x16	x16	0.88464	-0.01037	0.03509	-0.05987
x12	x12	0.03597	0.89709	0.08089	-0.07422
x7	x7	-0.04523	0.88429	0.05179	-0.02111
x10	x10	0.04466	0.76008	-0.09752	0.10556
x8	x8	-0.05390	-0.01789	0.94815	0.01385
x14	x14	0.03174	0.05200	0.93419	0.01556
x6	x6	-0.14660	0.13519	-0.12712	0.94308
x11	x11	0.51241	-0.04715	0.04973	0.59386
x13	x13	0.01932	0.12844	-0.17072	-0.71306

Referenzachsenkorrelationen

	Factor1	Factor2	Factor3	Factor4
Factor1	1.00000	-0.28783	-0.09058	-0.28080
Factor2	-0.28783	1.00000	-0.02248	0.29156
Factor3	-0.09058	-0.02248	1.00000	-0.18259
Factor4	-0.28080	0.29156	-0.18259	1.00000

Referenzstruktur (Semipartielle Korrelationen)

		Factor1	Factor2	Factor3	Factor4
x18	x18	0.88504	0.05157	-0.05949	-0.03421

x9	x9	0.87158	-0.00094	-0.00961	-0.00664
x16	x16	0.81845	-0.00966	0.03411	-0.05466
x12	x12	0.03327	0.83625	0.07862	-0.06776
x7	x7	-0.04184	0.82431	0.05034	-0.01928
x10	x10	0.04131	0.70853	-0.09480	0.09638
x8	x8	-0.04986	-0.01668	0.92162	0.01264
x14	x14	0.02936	0.04847	0.90805	0.01421
x6	x6	-0.13563	0.12602	-0.12356	0.86102
x11	x11	0.47406	-0.04395	0.04833	0.54219
x13	x13	0.01787	0.11973	-0.16595	-0.65101

Varianz erklärt nach jedem Faktor, andere Faktoren werden eliminiert			
Factor1	Factor2	Factor3	Factor4
2.4641735	1.9183368	1.7415756	1.4779633

Faktorstruktur (Korrelationen)					
		Factor1	Factor2	Factor3	Factor4
x18	x18	0.95098	0.27607	0.07136	0.16569
x9	x9	0.93867	0.20981	0.12688	0.21590
x16	x16	0.87319	0.19952	0.15227	0.16120
x12	x12	0.22932	0.92178	0.07139	-0.24930
x7	x7	0.15370	0.87903	0.04161	-0.21889
x10	x10	0.22434	0.74626	-0.06780	-0.07457
x8	x8	0.08464	-0.03195	0.94315	0.20587
x14	x14	0.18415	0.05655	0.94221	0.20944
x6	x6	0.09003	-0.10861	0.05132	0.85086
x11	x11	0.65109	-0.06625	0.25073	0.73735
x13	x13	-0.14756	0.29216	-0.31883	-0.77336

Varianz erklärt nach jedem Faktor, andere Faktoren werden ignoriert			
Factor1	Factor2	Factor3	Factor4
3.1693318	2.4450856	2.0002427	2.1676708

Endgült. Kommunalität Schätzung: Gesamte = 8.755401										
x6	x7	x8	x9	x10	x11	x12	x13	x14	x16	x18
0.76802937	0.77714736	0.89311235	0.88126008	0.57597858	0.78710502	0.85944643	0.64055781	0.89224653	0.76608666	0.91443037

Rotationsmethode: Promax (Potenz = 3)

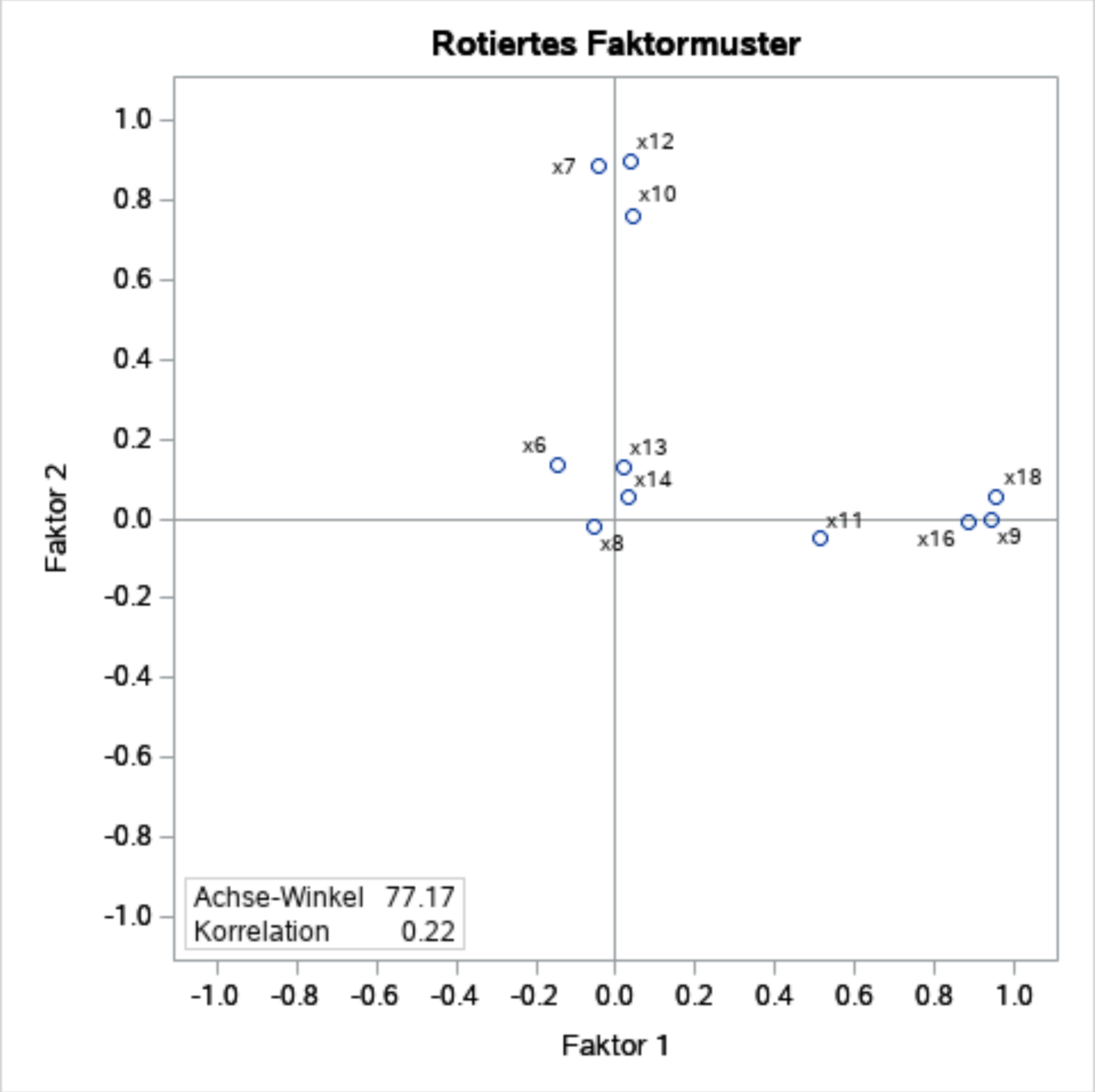
Scoring-Koeffizienten geschätzt nach Regression

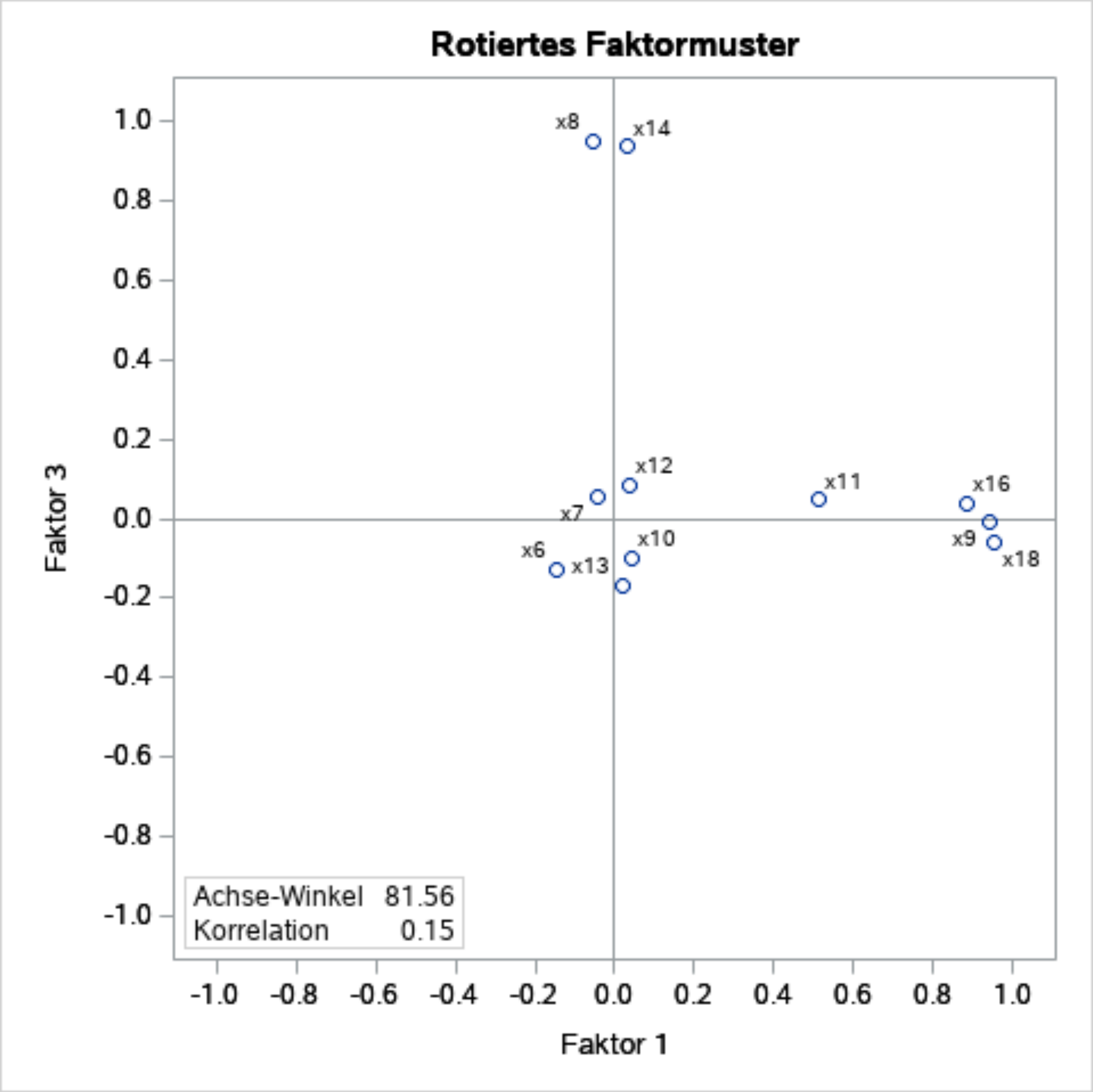
Quadratische multiple Korrelationen der Variablen bei jedem Faktor			
Factor1	Factor2	Factor3	Factor4
1.0000000	1.0000000	1.0000000	1.0000000

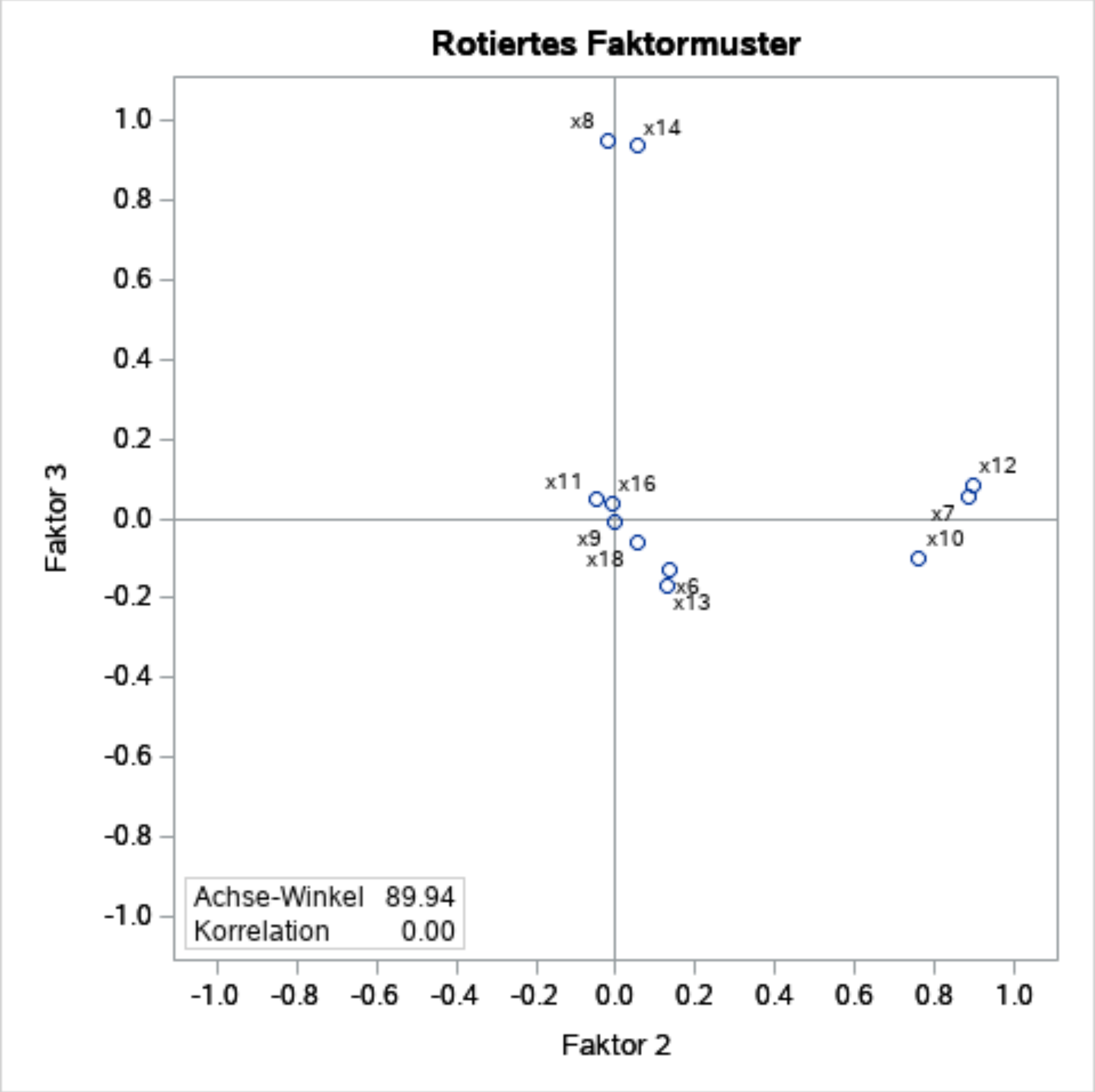
Standardisierte Scoring-Koeffizienten					
		Factor1	Factor2	Factor3	Factor4
x18	x18	0.33251	0.02095	-0.02900	-0.03160
x9	x9	0.32759	-0.00490	-0.00117	-0.01503
x16	x16	0.30848	-0.00920	0.02376	-0.04464
x12	x12	0.00943	0.40573	0.03823	-0.04354
x7	x7	-0.01949	0.40054	0.02149	-0.01222
x10	x10	0.01022	0.34493	-0.05989	0.06022
x8	x8	-0.01469	-0.01504	0.51455	-0.00385
x14	x14	0.01467	0.01632	0.50679	-0.00371
x6	x6	-0.06324	0.06276	-0.08292	0.53589
x11	x11	0.17163	-0.02430	0.02188	0.32870

x13	x13	0.01372	0.05953	-0.08434	-0.40069

Rotationsmethode: Promax (Potenz = 3)







Rotiertes Faktormuster
Faktor 3
Faktor 2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
x8
x14
x11
x16
x12
x7
x10
x9
x18
x6
x13
Achse-Winkel 89.94
Korrelation 0.00

Pfaddiagramm