Analisis Faktor

Pengertian Analisis Faktor

- Analisis faktor adalah alat analisis statistik yang dipergunakan untuk mereduksi/mengurangi data (data reduction) menjadi lebih sedikit untuk membuat sebuah variabel set baru yang dinamakan FAKTOR.

Variabel dan Sampel

- Variable yang dilibatkan dalam analisis faktor berjumlah minimal lima
- Ukuran sample yang disarankan berjumlah 100 atau lebih.

Note :

- Kass and Tinsley (1979): 5~10 participants per variable up to a total of 300
- Tabachnick and Fidell (2007): at least 300 cases
- Comrey and Lee (1992): 300 (good); 100 (poor); 1000 (excellent)
- MacCallum, Widaman, Zhang, and Hong (1999): communalities to sample size 300 or more participants + enough variables

Tujuan Analisis Faktor

1. Data *Summarization, yakni mengidentifikasi adanya hubungan antar* variabel dengan melakukan uji korelasi. Jika korelasi dilakukan antar variabel (dalam pengertian SSPS adalah ”kolom”), analisis tersebut dinamakan R *Factor Analysis. Namun jika korelasi dilakukan antar* responden atau sampel (dalam pengertian SSPS adalah ”baris”), analisis disebut Q *Factor Analysis, yang juga populer disebut Cluster Analysis.*
2. Data *Reduction, yakni setelah melakukan korelasi, dilakukan proses* membuat sebuah variabel set baru yang dinamakan faktor untuk menggantikan sejumlah variabel tertentu.

Proses Analisis Faktor

1. Memilih variabel yang layak dimasukkan dalam analisis faktor. Analisis faktor berupaya mengelompokkan sejumlah variabel, sehingga harus ada korelasi yang cukup kuat di antara variabel untuk dapat dikelompokan.

   Alat yang digunakan:

   a. *Measure of Sampling Adequency* /MSA (sig > 0.5)

   b. *Barlett's Test of Sphericity* (sig < 0.05)

Proses Analisis Faktor

2. Setelah sejumlah variabel terpilih, maka dilakukan ‘eksraksi’ varibel tersebut, sehingga menjadi satu/beberapa faktor.

   Alat yang digunakan:

   a. Metode Analisis Utama *(Principal Component Analysis)*
   b. *Maximum Likehood*
   c. *Metode Analisis Faktor* Umum *(Common Factor Analysis/CFA).*

Proses Analisis Faktor

3. Melakukan proses rotasi untuk memperjelas apakah faktor yg terbentuk sudah secara signifikan berbeda dengan faktor lain.
4. Setelah faktor benar-benar sudah terbentuk, proses selanjutnya menamakan faktor yang ada kemudian dilakukan validitas hasil faktor.

Hal-Hal yang Mendorong Nasabah Menabung di Bank

1. Tingkat suku bunga
2. Fleksibilitas Pengembalian Uang
3. Pelayanan Teller
4. Pelayanan Satpam
5. Kecepatan Pelayanan Customer Service
6. Keramahaan pelayanan Customer Service
7. Parkir yang luas
8. Parkir yang aman
9. Image bank di masyarakat
10. Lokasi strategis bank
11. Jarak dari rumah ke bank
12. Tersedianya angkutan umum ke bank
13. Gedung yang megah
14. AC yang dingin
15. Ruang tunggu yang nyaman

Pengelompokan Variabel Hasil Analisis Faktor

FAKTOR 1 Pelayanan SDM	FAKTOR 2 Fasilitas Fisik	FAKTOR 3 Faktor Non Fisik
• Pelayanan Teller	• Lokasi Strategis	• Tingkat suku bunga
• Pelayanan Satpam	• Jarak dari rumah ke bank	• Fleksibilitas Pengambilan Uang
• Kecepatan pelayanan Customer Service	• Tersedianya angkutan umum ke Bank	• Image Bank di masyarakat
• Keramahan pelayanan Customer Service	• Gedung yang megah • AC yang dingin • Ruang Tunggu yang nyaman • Parkir yang luas • Parkir yang aman	

Contoh Perhitungan Analisis Faktor dengan SPSS

Are There Other Treat that Might Contribute to Anxiety About SPSS?

- Interview pada mahasiswa → Kuesioner yang terdiri dari 23 pertanyaan
- Skala Likert
- Sample sebanyak 2571 responden

No	Questions	No	Questions
1	Statistics makes me cry	13	I worry that I will cause irreparable damage because of my incompetenece with computers
2	My friends will think I'm stupid for not being able to cope with SPSS	14	Computers have minds of their own and deliberately go wrong whenever I use them
3	Standard deviations excite me	15	Computers are out to get me
4	I dream that Pearson is attacking me with correlation coefficients	16	I weep openly at the mention of central tendency
5	I don’t understand statistics	17	I slip into a coma whenever I see an equation
6	I have little experience of computers	18	SPSS always crashes when I try to use it
7	All computers hate me	19	Everybody looks at me when I use SPSS
8	I have never been good at mathematics	20	I can't sleep for thoughts of eigen vectors
9	My friends are better at statistics than me	21	I wake up under my duvet thinking that I am trapped under a normal distribtion
10	Computers are useful only for playing games	22	My friends are better at SPSS than I am
11	I did badly at mathematics at school	23	If I'm good at statistics my friends will think I'm a nerd
12	People try to tell you that SPSS makes statistics easier to understand but it doesn't		

SAQ [DataSet1] - SPSS Data Editor

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1 : Question_01 | 2

	Question	Question_0	Question_0	Question_0	Question_0	Question_0	Question_0	Question_0	Question_0	Question_1	Question_1	Question_1	Question_1	Question_1	Question_1	Question_1	Question_1
1	2	1	4	2	2	2	3	1	1	2	1	2	2	2	2	3	1	2
2	1	1	4	3	2	2	2	2	5	2	2	3	1	3	4	3	2	2
3	2	3	2	2	4	1	2	2	2	2	3	3	2	4	2	3	2	3
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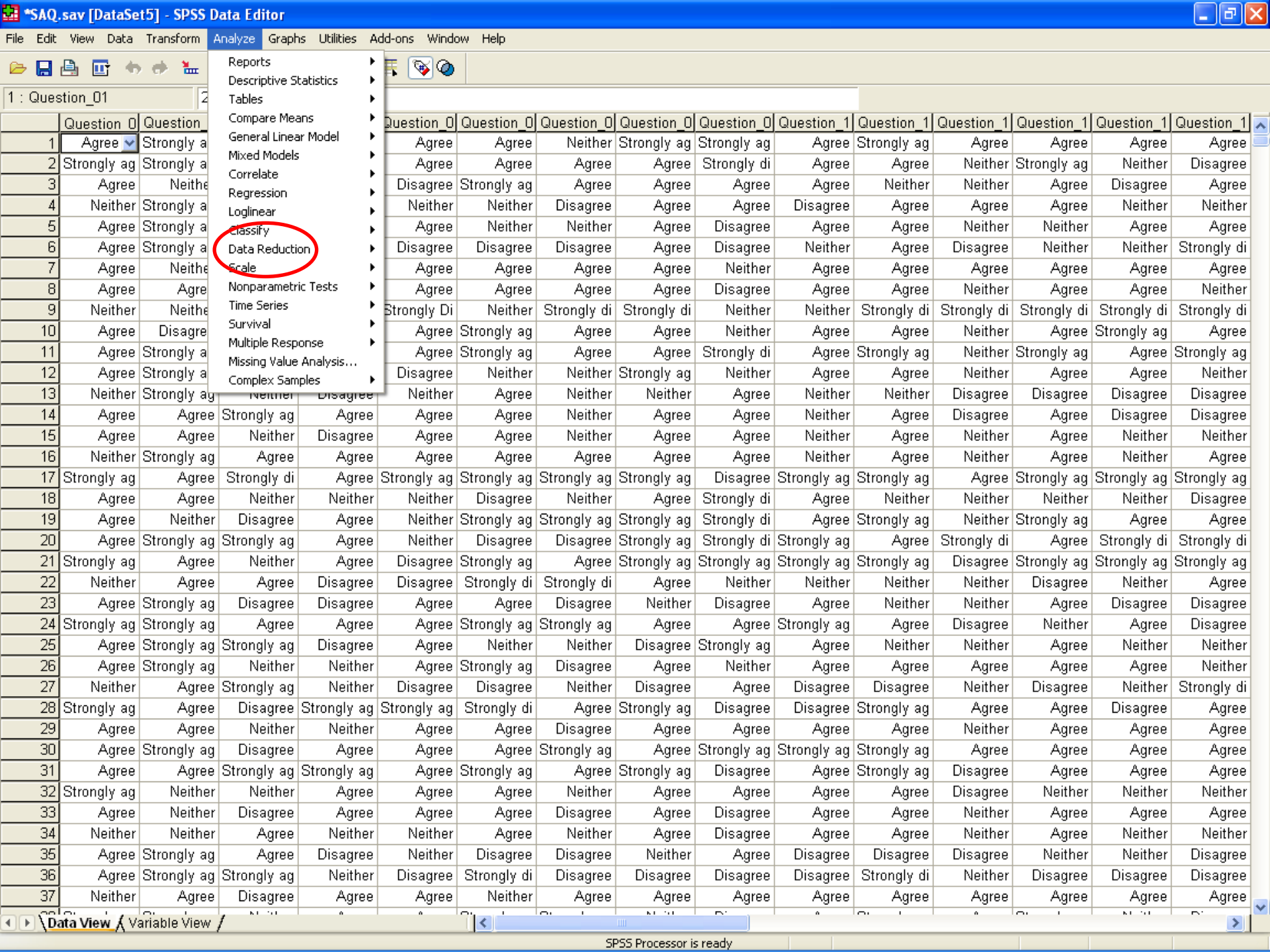
Data View | Variable View

SPSS Processor is ready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Time Series
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Multiple Response
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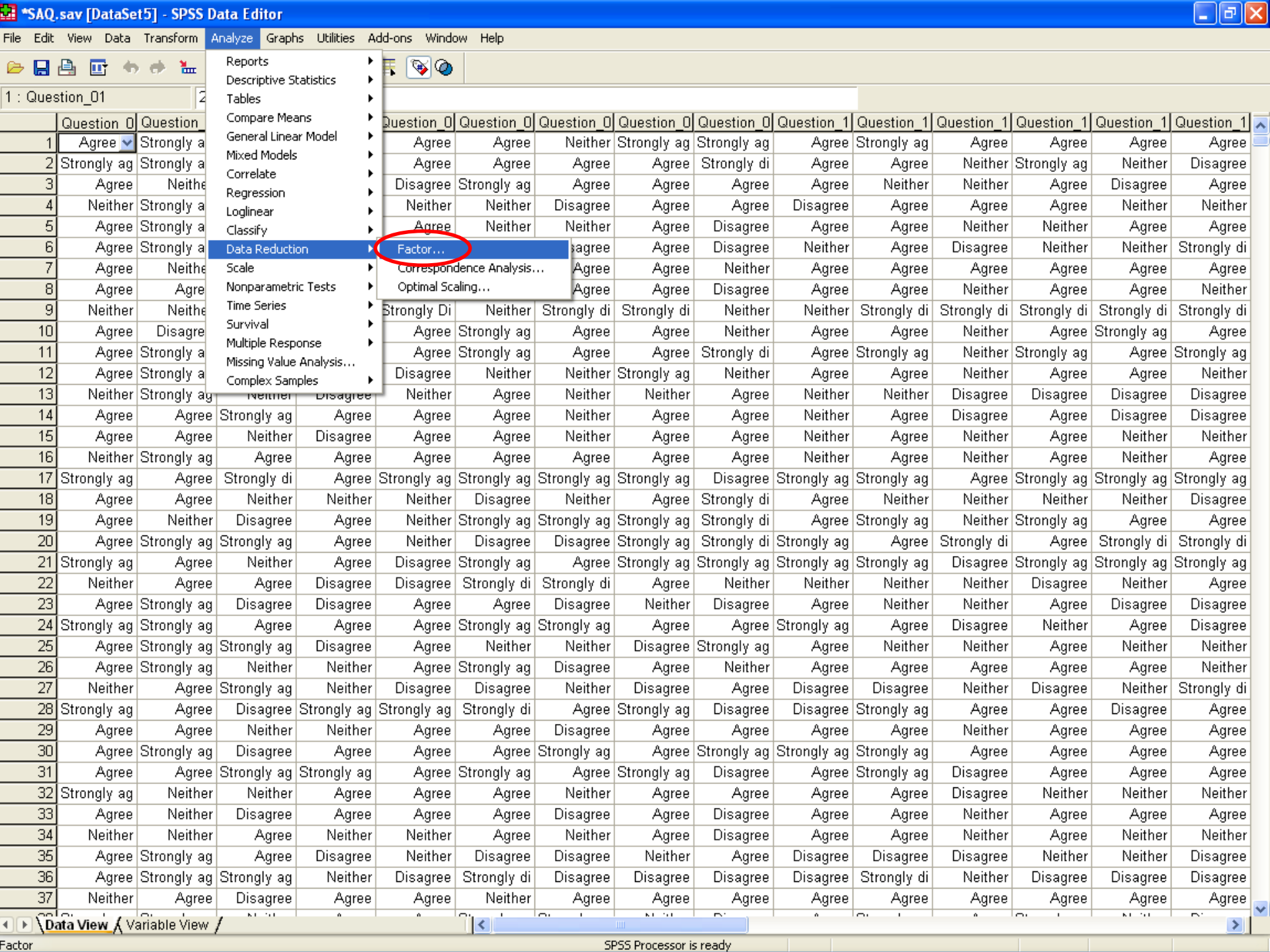
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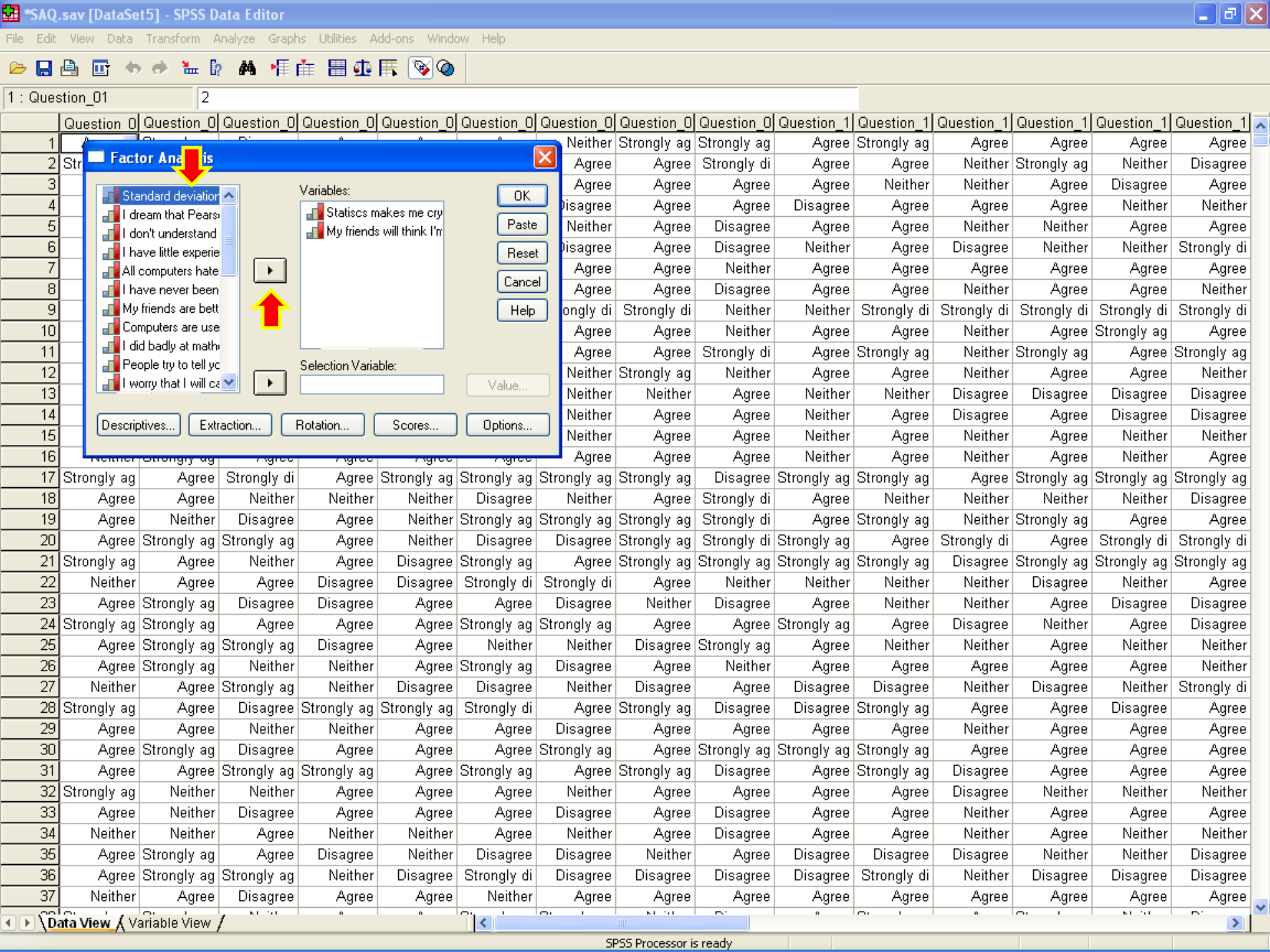
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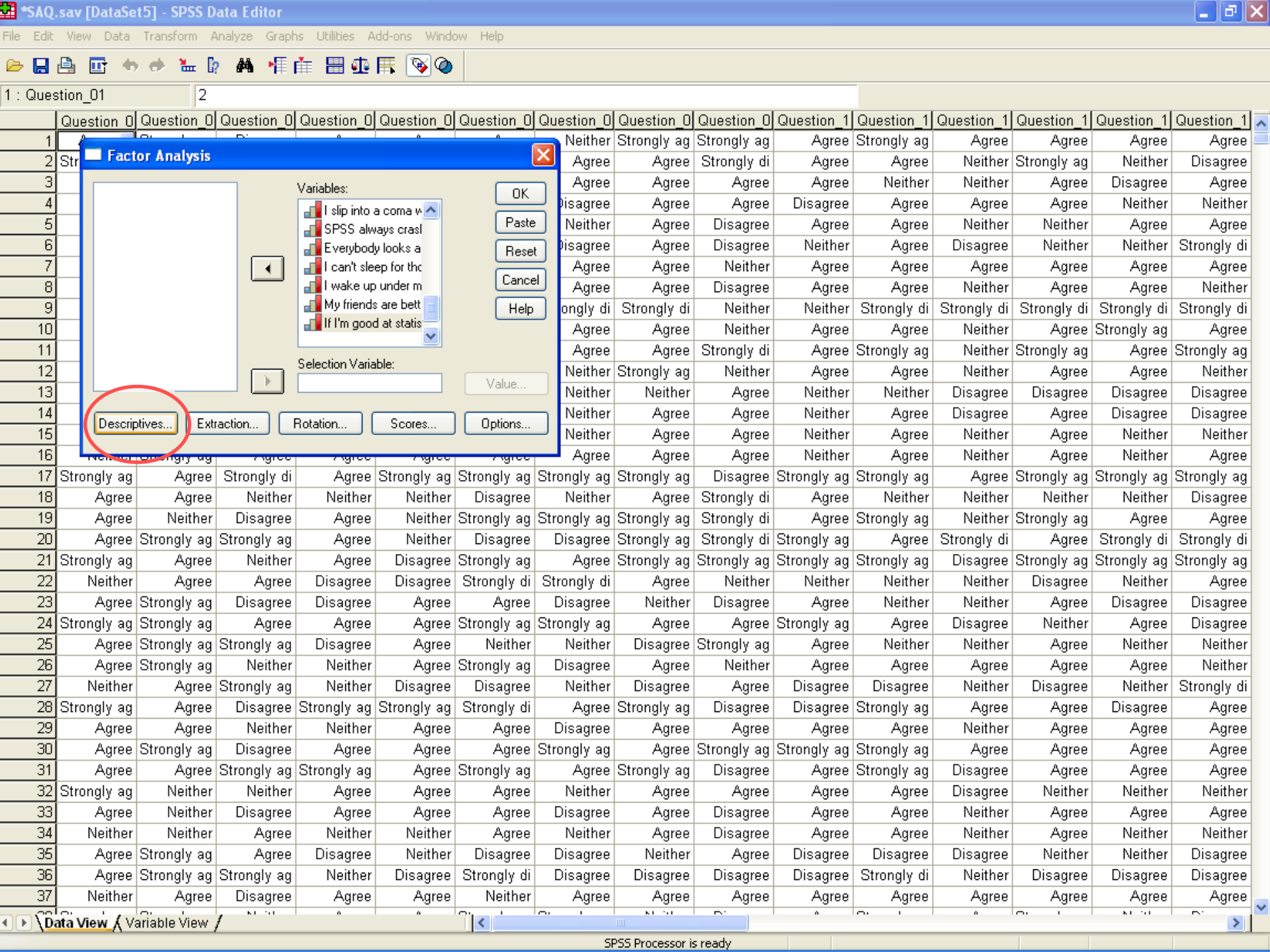
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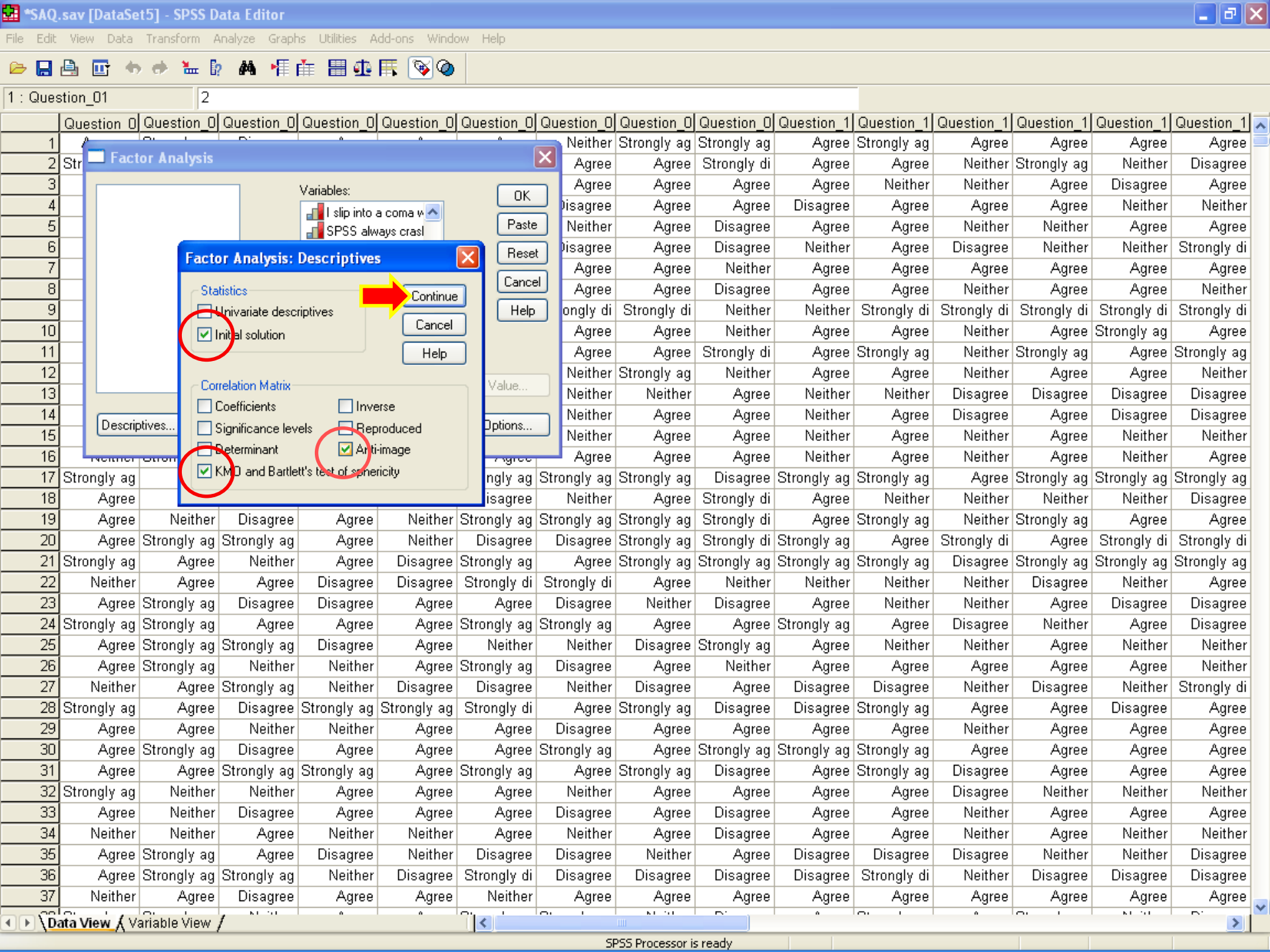
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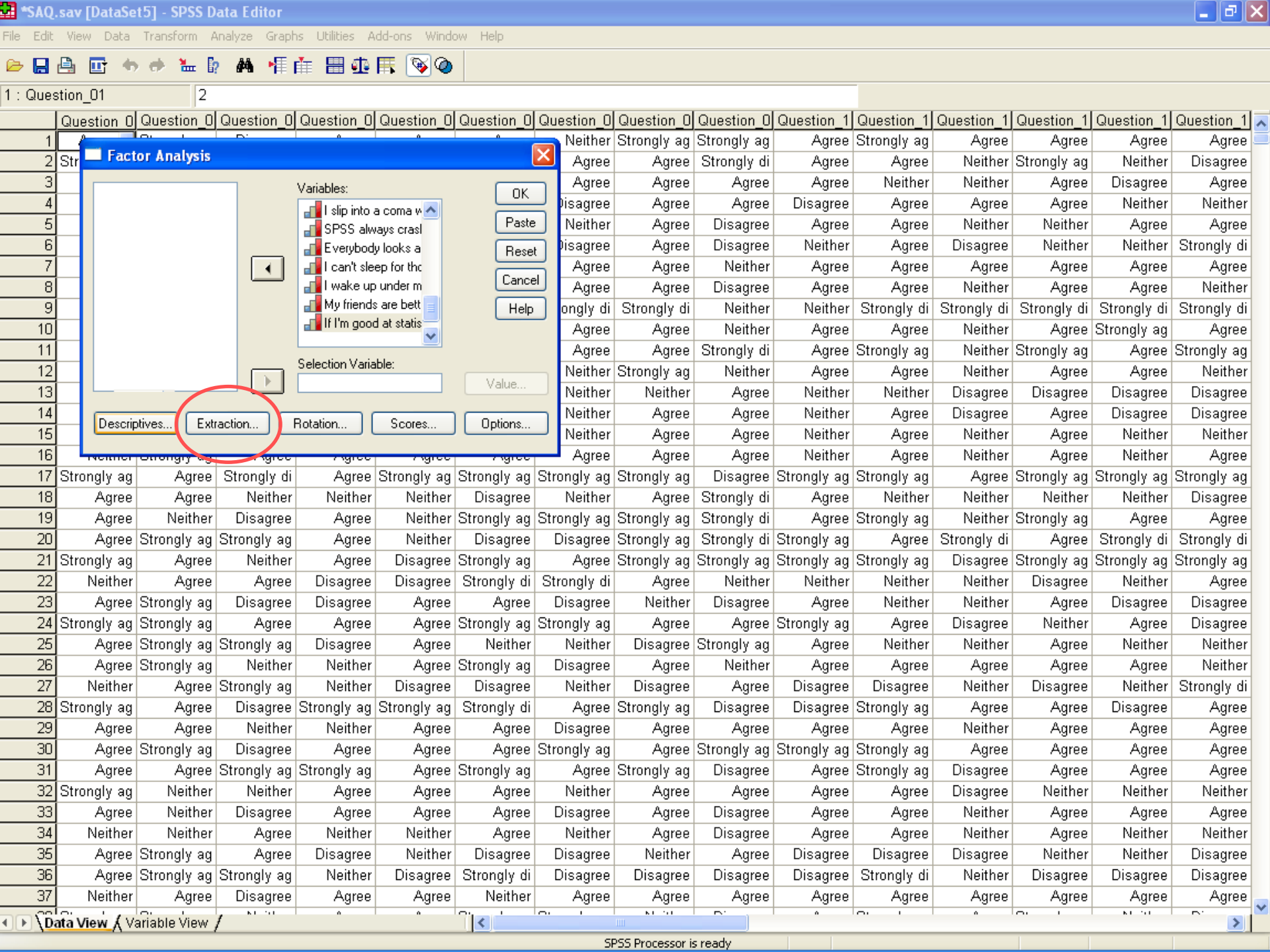
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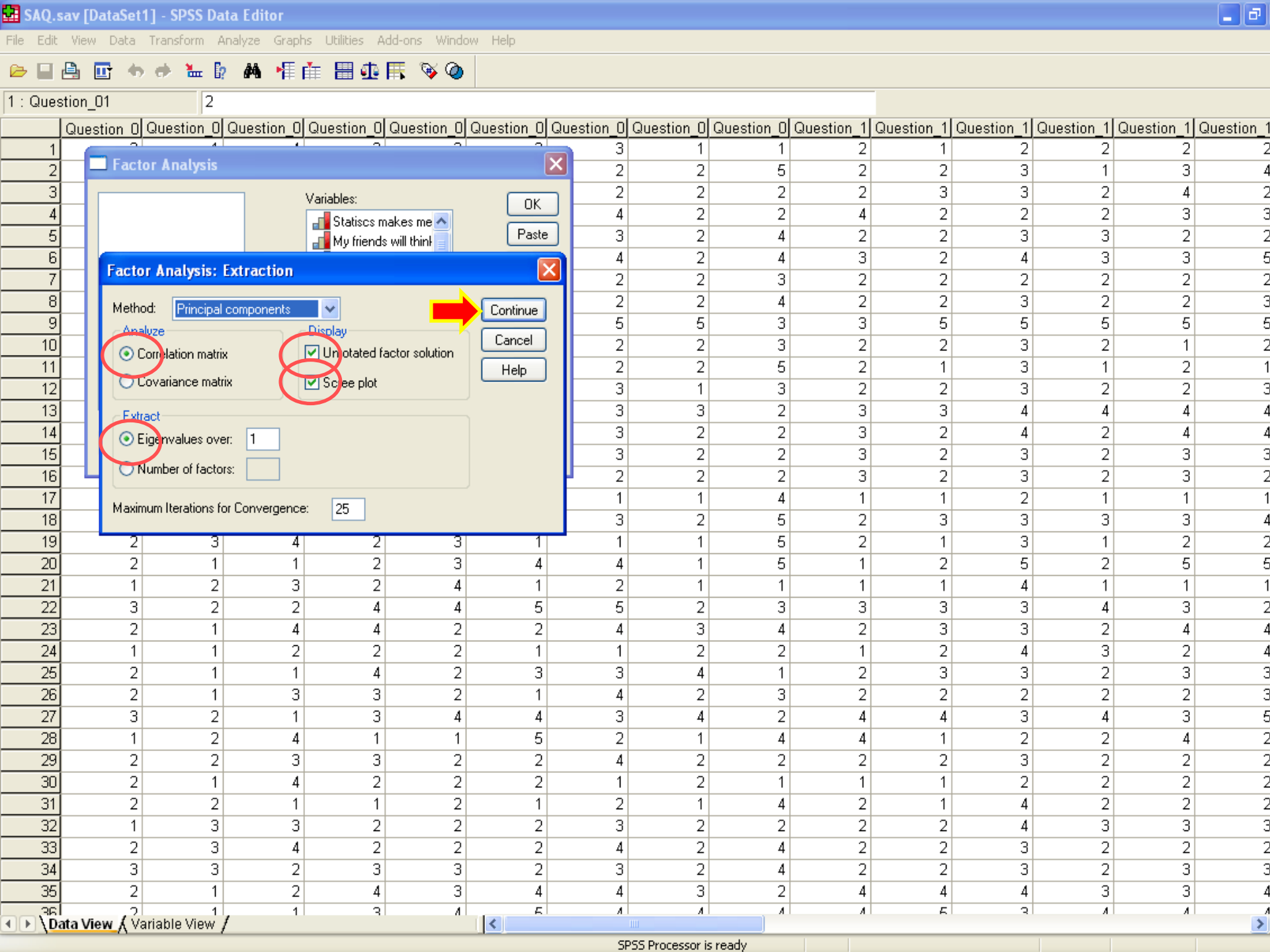
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2
Factor Analysis
Variables:
Statiscs makes me
My friends will think
OK
Paste
Factor Analysis: Extraction
Method: Principal components
Analyze
Correlation matrix
Covariance matrix
Display
Unrotated factor solution
Scree plot
Extract
Eigenvalues over: 1
Number of factors:
Maximum Iterations for Convergence: 25
Continue
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Data View
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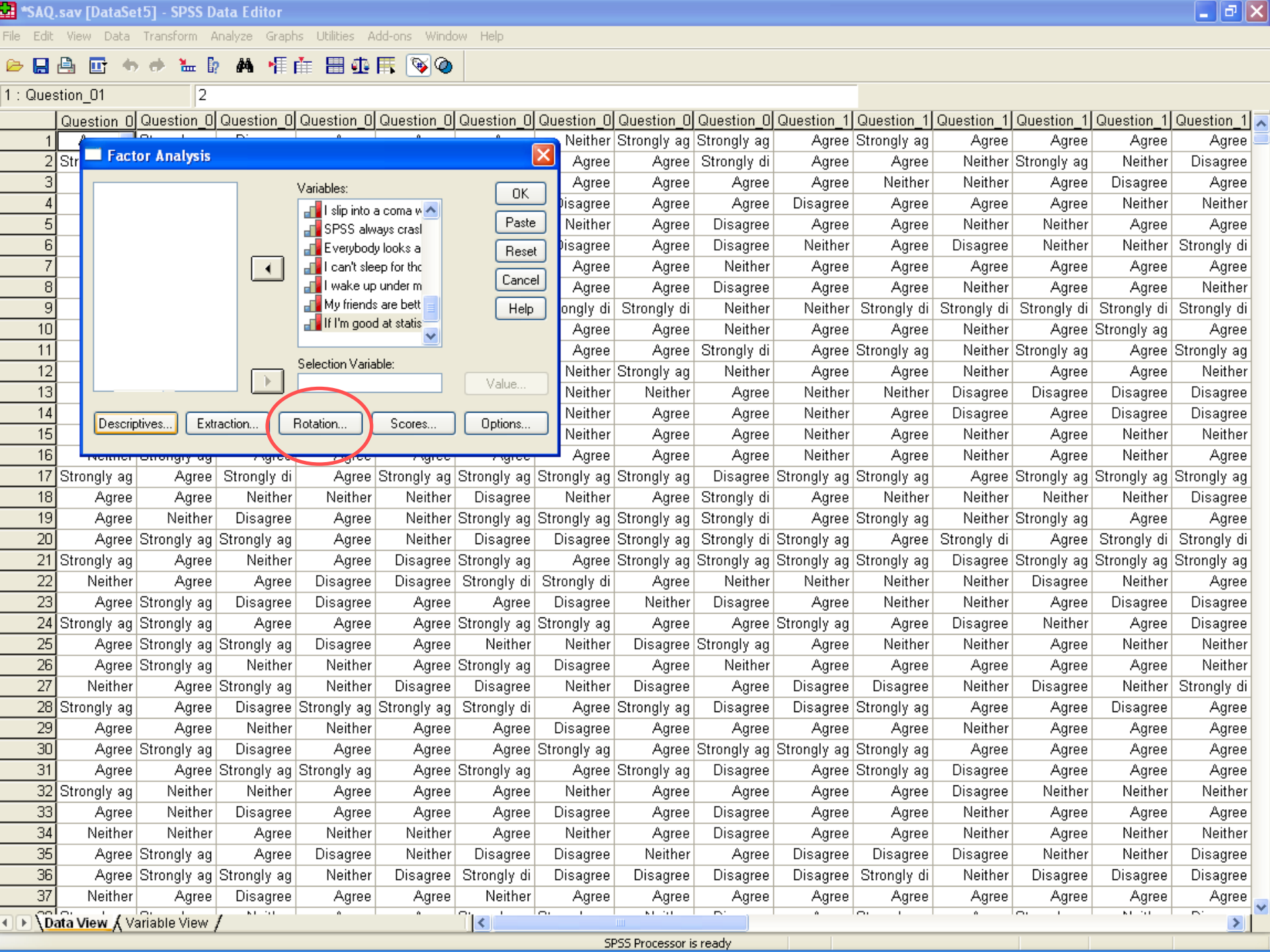
SPSS Processor is ready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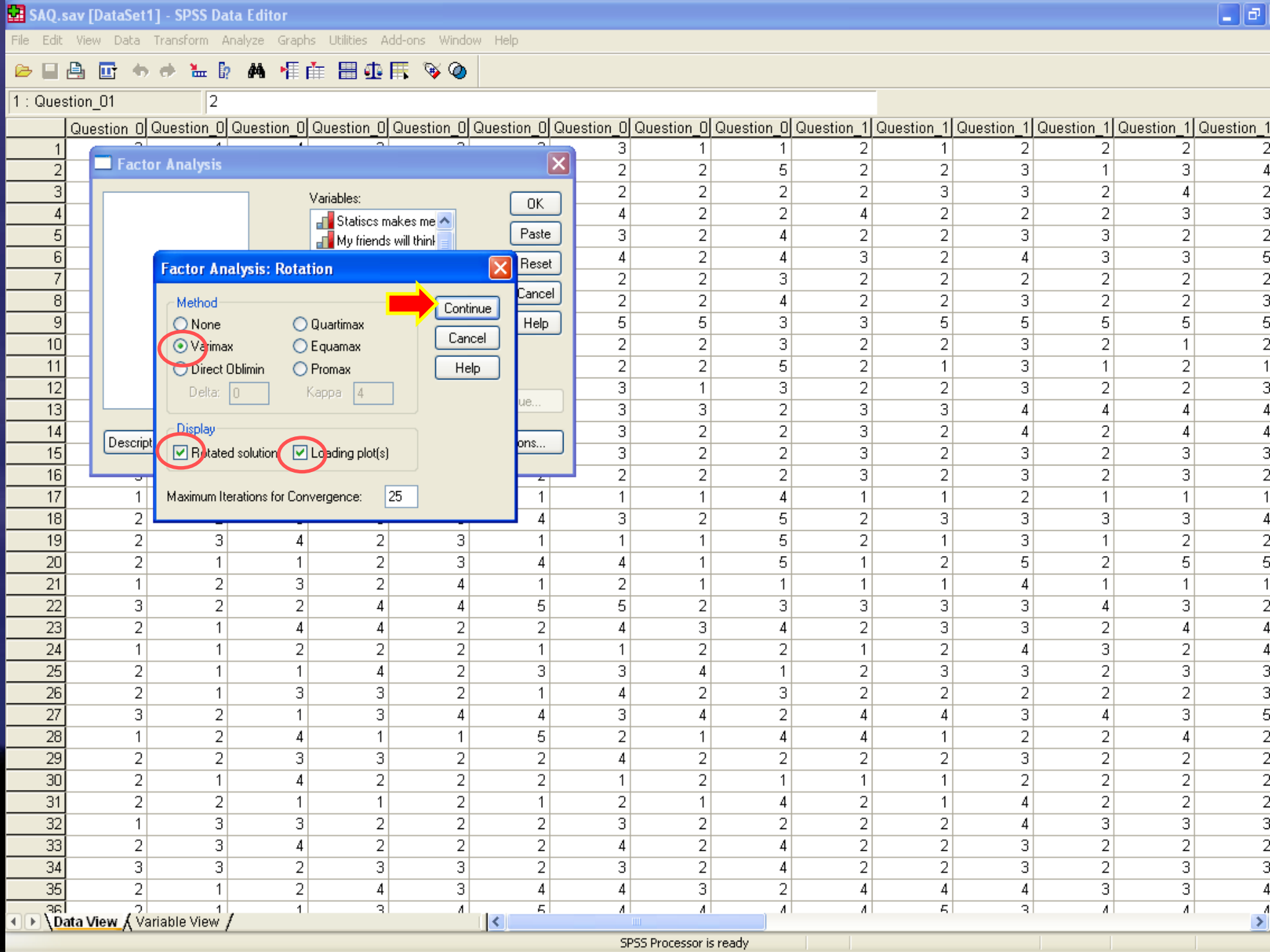
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1 : Question_01
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Method
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Data View
Variable View
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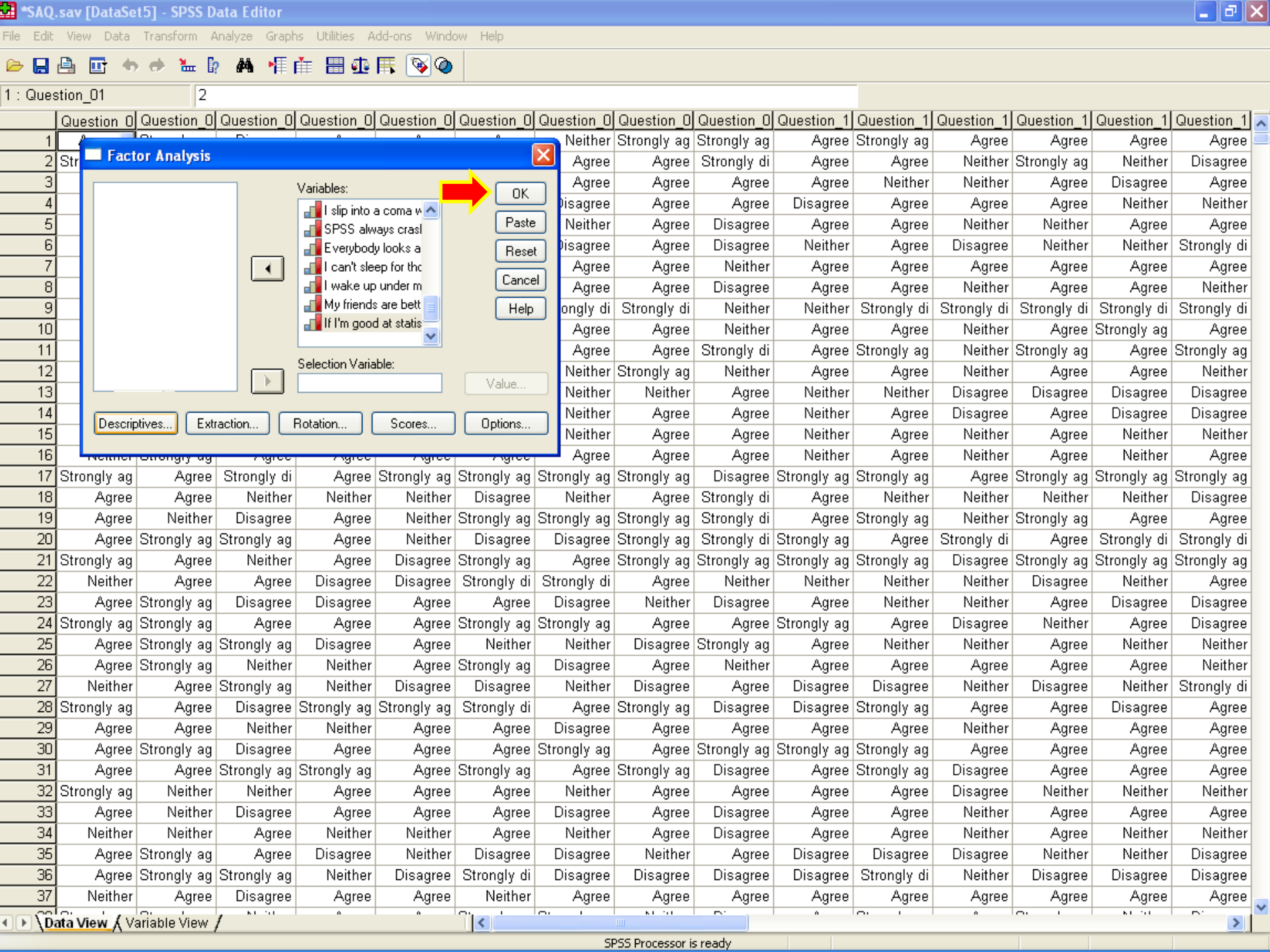
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Data View
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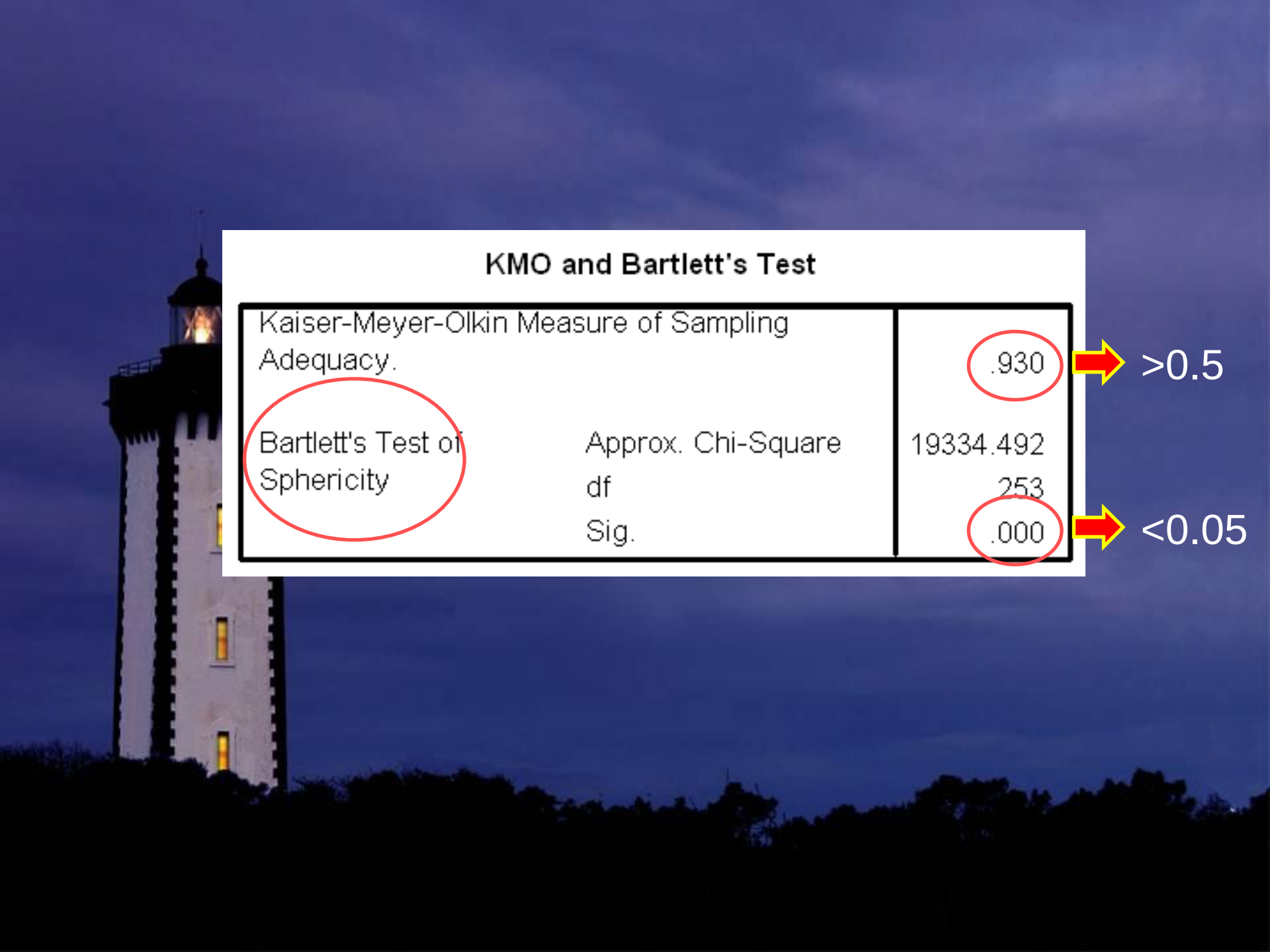


KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.930
Bartlett's Test of Sphericity	Approx. Chi-Square	19334.492
	df	253
	Sig.	.000

>0.5

<0.05

Anti-Image Matrices

Anti-image Matrices

		Statiscs makes me cry	My friends will think I'm stupid for not being able to cope with SPSS	Standard deviations excite me	I dream that Pearson is attacking me with correlation coefficients	I don't understand statistics	I have little experience of computers	All computers hate me	I have never been good at mathematics	My friends are better at statistics than me
Anti-image Covariance	Everybody looks at me when I use SPSS	.009	-.023	-.083	-.024	-.013	-.010	.044	.030	-.087
	I can't sleep for thoughts of eigen vectors	-.011	.045	.052	-.003	-.008	.033	.030	.013	.029
	I wake up under my duvet thinking that I am trapped under a normal distribtion	.004	.028	.040	-.050	-.029	.022	-.112	-.011	-.020
	My friends are better at SPSS than I am	.001	-.100	-.005	-.023	.027	.028	.008	-.015	-.101
	If I'm good at statistics my friends will think I'm a nerd	-.045	-.002	-.057	-.013	-.004	.013	-.006	.002	-.078
Anti-image Correlation	Statiscs makes me cry	.930[a]	-.020	.053	-.167	-.156	.020	.023	-.049	-.016
	My friends will think I'm stupid for not being able to cope with SPSS	-.020	.875[a]	[illegible]	[illegible]	.010	-.053	.016	-.033	-.193
	Standard deviations excite me	.053	-.157	.951[a]	.084	.037	-.042	.072	-.007	-.142
	I dream that Pearson is attacking me with correlation coefficients	-.167	-.041	.084	.955[a]	[illegible]	[illegible]	-.087	-.075	.030
	I don't understand statistics	-.156	.010	.037	-.134	.960[a]	-.035	-.044	-.027	-.020
	I have little experience of computers	.020	-.053	-.042	-.007	-.035	.891[a]	[illegible]	[illegible]	.011
	All computers hate me	.023	.016	.072	-.087	-.044	[illegible]	.942[a]	-.015	-.030
	I have never been good at mathematics	-.049	-.033	-.007	-.075	-.027	.024	-.015	.871[a]	-.099
	My friends are better at statistics than me	-.016	-.193	-.142	.030	-.020	.011	-.030	-.099	.834[a]
	Computers are useful only for playing games	-.012	-.012	-.016	.006	-.093	-.116	-.033	.051	.043
	I did badly at mathematics at school	-.041	.038	.064	-.022	-3.27E-005	-.084	.045	-.412	.037
	People try to tell you that SPSS makes statistics easier to understand but it	-.007	.031	.087	-.154	-.058	.045	-.043	.033	-.003

Communalities

	Initial	Extraction
Statiscs makes me cry	1,000	,435
My friends will think I'm stupid for not being able to cope with SPSS	1,000	,414
Standard deviations excite me	1,000	,530
I dream that Pearson is attacking me with correlation coefficients	1,000	,469
I don't understand statistics	1,000	,343
I have little experience of computers	1,000	,654
All computers hate me	1,000	,545
I have never been good at mathematics	1,000	,739
My friends are better at statistics than me	1,000	,484
Computers are useful only for playing games	1,000	,335
I did badly at mathematics at school	1,000	,690
People try to tell you that SPSS makes statistics	1,000	,513

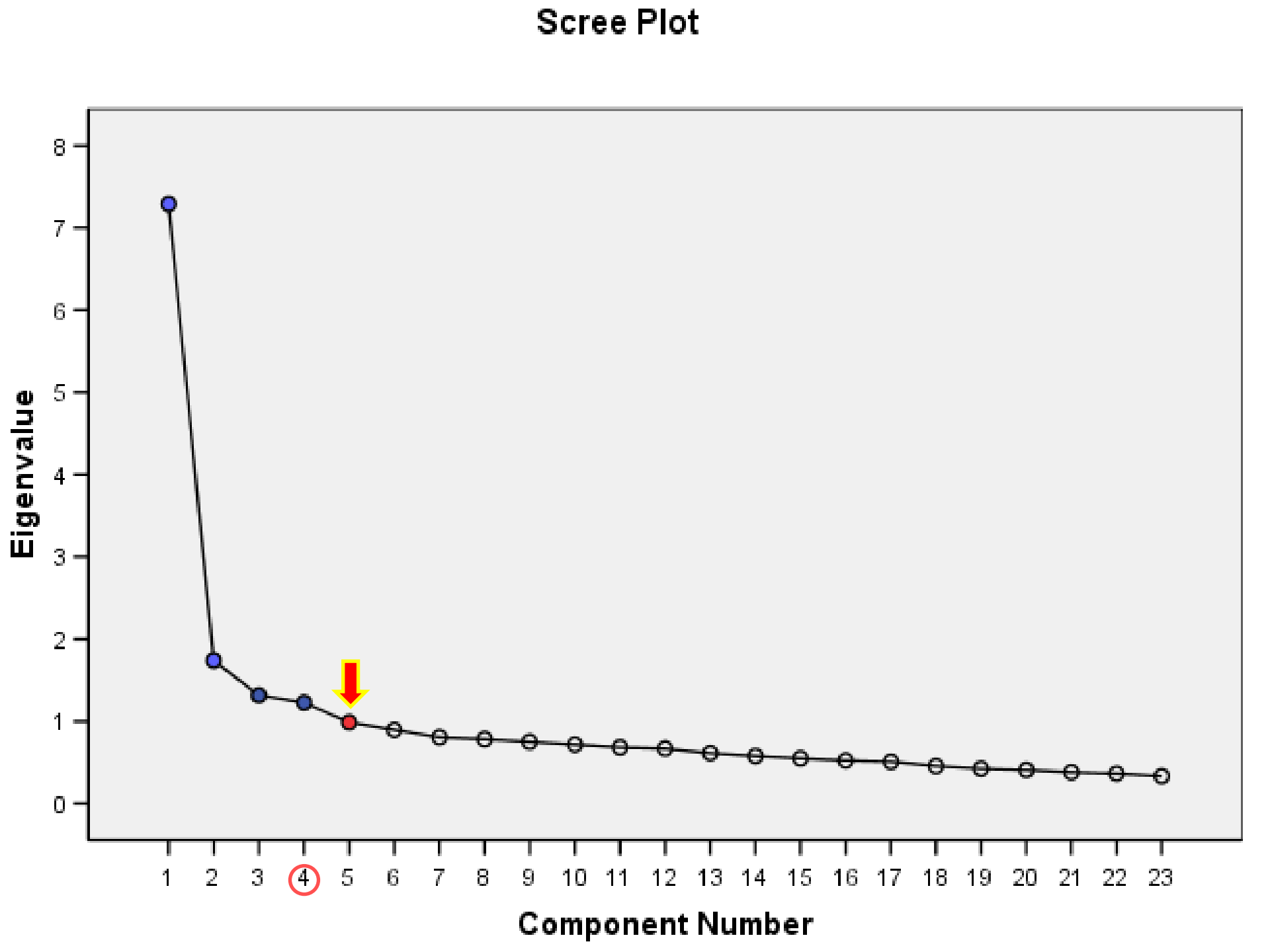
- Sekitar 43,5% varians dari variabel Statistics makes me cry dapat dijelaskan oleh Faktor yang nantinya terbentuk.
- Semakin kecil comunalities sebuah variabel, semakin lemah hubungannya dengan faktor yang terbentuk.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,290	31,696	31,696	7,290	31,696	31,696	3,730	16,219	16,219
2	1,739	7,560	39,256	1,739	7,560	39,256	3,340	14,523	30,742
3	1,317	5,725	44,981	1,317	5,725	44,981	2,553	11,099	41,841
4	1,227	5,336	50,317	1,227	5,336	50,317	1,950	8,476	50,317
5	,988	4,295	54,612						
6	,895	3,893	58,504						
7	,806	3,502	62,007						
8	,783	3,404	65,410						
9	,751	3,265	68,676						
10	,717	3,117	71,793						
11	,684	2,972	74,765						
12	,670	2,911	77,676						
13	,612	2,661	80,337						
14	,578	2,512	82,849						
15	,549	2,388	85,236						
16	,523	2,275	87,511						
17	,508	2,210	89,721						
18	,456	1,982	91,704						
19	,424	1,843	93,546						
20	,408	1,773	95,319						
21	,379	1,650	96,969						
22	,364	1,583	98,552						
23	,333	1,448	100,000						

Extraction Method: Principal Component Analysis.

- Total keempat faktor dapat menjelaskan 50,31% dari variabilitas 23 variabel asli di atas.


Scree Plot
Eigenvalue
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Component Number

Component Matrix[a]

	Component			
	1	2	3	4
Statiscs makes me cry	,586	,175	-,215	,119
My friends will think I'm stupid for not being able to cope with SPSS	-,303	,548	,146	,010
Standard deviations excite me	-,629	,290	,213	-,067
I dream that Pearson is attacking me with correlation coefficients	,634	,144	-,149	,153
I don't understand statistics	,556	,101	-,074	,137
I have little experience of computers	,562	,097	,571	-,048
All computers hate me	,685	,039	,252	,103
I have never been good at mathematics	,549	,401	-,323	-,417
My friends are better at statistics than me	-,284	,627	-,008	,103
Computers are useful only for playing games	,437	,035	,363	-,103
I did badly at mathematics at school	,652	,245	-,209	-,400
People try to tell you that SPSS makes statistics easier to understand but it	,669	-,048	,051	,248

- Sesuai dengan jumlah faktor yg di dapat (hasil sblm dilakukan proses rotasi)

Rotated Component Matrix[a]

	Component			
	1	2	3	4
Statiscs makes me cry	,241	,496	,356	,061
My friends will think I'm stupid for not being able to cope with SPSS	-,005	-,338	,068	,543
Standard deviations excite me	-,203	-,567	-,180	,368
I dream that Pearson is attacking me with correlation coefficients	,320	,516	,314	,039
I don't understand statistics	,319	,429	,238	,015
I have little experience of computers	,800	-,010	,097	-,072
All computers hate me	,638	,327	,155	-,082
I have never been good at mathematics	,131	,168	,833	,005
My friends are better at statistics than me	-,094	-,204	,118	,648
Computers are useful only for playing games	,550	,001	,130	-,123
I did badly at mathematics at school	,263	,206	,747	-,143
People try to tell you that SPSS makes statistics easier to understand but it doesn't	,473	,523	,095	-,084

Factor 1 Computers	Factor 2 Statistics	Factor 3 Mathematics	Factor 4 Peer Evaluation
I have little experience of computers	Statistics makes me cry	I have never been good at mathematics	My friends will think I'm stupid for not being able to cope with SPSS
All computers hate me	I dream that Pearson is attacking me with correlation coefficients	I have never been good at mathematics	Standard deviations excite me
Computers are useful only for playing games	I don't understand statistics	I did badly at mathematics at school	My friends are better at statistics than me
People try to tell you that SPSS makes statistics easier to understand but it doesn't	People try to tell you that SPSS makes statistics easier to understand but it doesn't	I slip into a coma whenever I see an equation	Everybody looks at me when I use SPSS
Computers have minds of their own and deliberately go wrong whenever I use them	I weep openly at the mention of central tendency		My friends are better at SPSS than I am
Computers are out to get me	I can't sleep for thoughts of eigen vectors		If I'm good at statistics my friends will think I'm a nerd
SPSS always crashes when I try to use it	I wake up under my duvet thinking that I am trapped under a normal distribtion		

SEKIAN SHARING UNTUK
ANALISIS FAKTOR

SELANJUTNYA ANALISIS CLUSTER
ATAU ANALISIS JALUR

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TERIMA KASIH