CHAPTER 6: FACTOR ANALYSIS

Analysis of social mobility data

3-Factor Unrotated Solution

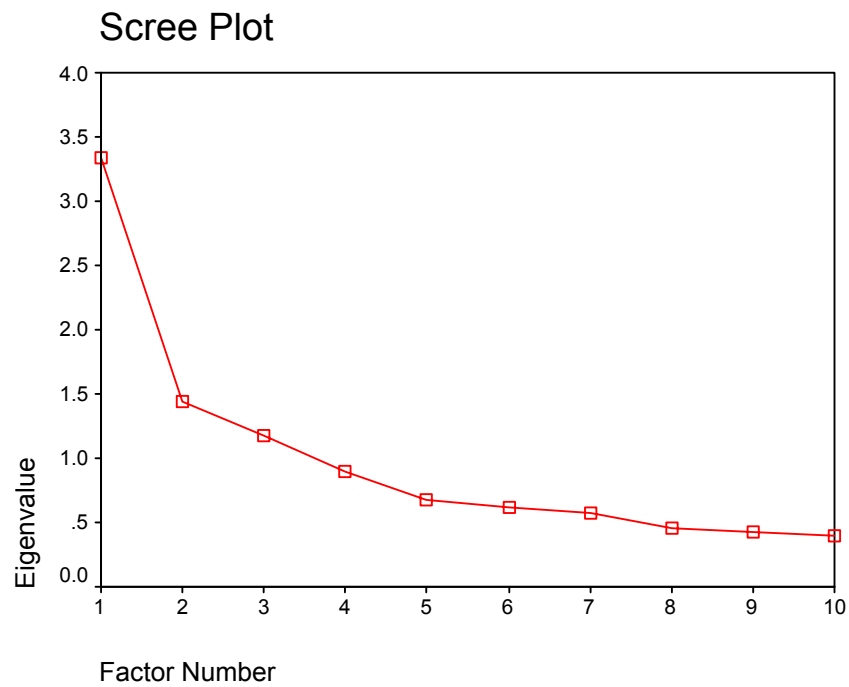### Communalities

	Initial	Extraction
X1	.254	.346
X2	.211	.281
X3	.373	.364
X4	.387	.383
X5	.363	.563
X6	.276	.355
X7	.305	.529
X8	.373	.498
X9	.315	.542
X10	.347	.439

Extraction Method: Maximum Likelihood.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.342	33.422	33.422	2.778	27.776	27.776
2	1.437	14.367	47.788	.866	8.659	36.435
3	1.173	11.733	59.521	.657	6.568	43.003
4	.890	8.904	68.425			
5	.682	6.821	75.246			
6	.616	6.165	81.411			
7	.566	5.662	87.073			
8	.461	4.613	91.685			
9	.433	4.330	96.015			
10	.398	3.985	100.000			

Extraction Method: Maximum Likelihood.

Scree Plot

Factor Matrix[a]

	Factor 1	Factor 2	Factor 3
X1	.426	.403	5.347E-02
X2	.404	.343	8.469E-03
X3	.592	-2.55E-02	.116
X4	.558	-.240	.118
X5	.575	.481	3.075E-02
X6	.451	-.126	.369
X7	.477	-.296	.462
X8	.615	-.191	-.289
X9	.519	-.358	-.381
X10	.602	.168	-.219

Extraction Method: Maximum Likelihood.

a. 3 factors extracted. 10 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
143.799	18	.000

3-Factor VARIMAX Rotated Solution

Communalities

	Initial	Extraction
X1	.254	.346
X2	.211	.281
X3	.373	.364
X4	.387	.383
X5	.363	.563
X6	.276	.355
X7	.305	.529
X8	.373	.498
X9	.315	.542
X10	.347	.439

Extraction Method: Maximum Likelihood.

Total Variance Explained

Factor	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	3.342	33.422	33.422	2.778	27.776	27.776	1.568	15.675	15.675
2	1.437	14.367	47.788	.866	8.659	36.435	1.379	13.787	29.462
3	1.173	11.733	59.521	.657	6.568	43.003	1.354	13.541	43.003
4	.890	8.904	68.425						
5	.682	6.821	75.246						
6	.616	6.165	81.411						
7	.566	5.662	87.073						
8	.461	4.613	91.685						
9	.433	4.330	96.015						
10	.398	3.985	100.000						

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

	Factor		
	1	2	3
X1	.426	.403	5.347E-02
X2	.404	.343	8.469E-03
X3	.592	-2.55E-02	.116
X4	.558	-.240	.118
X5	.575	.481	3.075E-02
X6	.451	-.126	.369
X7	.477	-.296	.462
X8	.615	-.191	-.289
X9	.519	-.358	-.381
X10	.602	.168	-.219

Extraction Method: Maximum Likelihood.

a. 3 factors extracted. 10 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
143.799	18	.000

3

Rotated Factor Matrix[a]

	Factor		
	1	2	3
X1	.576	4.236E-02	.111
X2	.516	8.577E-02	8.975E-02
X3	.329	.288	.416
X4	.135	.360	.485
X5	.728	.113	.144
X6	.163	7.845E-02	.568
X7	4.230E-02	.106	.718
X8	.209	.645	.194
X9	1.769E-02	.723	.140
X10	.491	.434	9.760E-02

Extraction Method: Maximum Likelihood.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Factor Transformation Matrix

Factor	1	2	3
1	.590	.599	.542
2	.807	-.439	-.395
3	-.001	-.670	.742

Extraction Method: Maximum Likelihood.
Rotation Method: Varimax with Kaiser Normalization.

3-Factor OBLIMIN Rotated Solution

Communalities

	Initial	Extraction
X1	.254	.346
X2	.211	.281
X3	.373	.364
X4	.387	.383
X5	.363	.563
X6	.276	.355
X7	.305	.529
X8	.373	.498
X9	.315	.542
X10	.347	.439

Extraction Method: Maximum Likelihood.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.342	33.422	33.422	2.778	27.776	27.776	1.890
2	1.437	14.367	47.788	.866	8.659	36.435	2.015
3	1.173	11.733	59.521	.657	6.568	43.003	1.885
4	.890	8.904	68.425				
5	.682	6.821	75.246				
6	.616	6.165	81.411				
7	.566	5.662	87.073				
8	.461	4.613	91.685				
9	.433	4.330	96.015				
10	.398	3.985	100.000				

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Factor Matrix[a]

	Factor		
	1	2	3
X1	.426	.403	5.347E-02
X2	.404	.343	8.469E-03
X3	.592	-2.55E-02	.116
X4	.558	-.240	.118
X5	.575	.481	3.075E-02
X6	.451	-.126	.369
X7	.477	-.296	.462
X8	.615	-.191	-.289
X9	.519	-.358	-.381
X10	.602	.168	-.219

Extraction Method: Maximum Likelihood.

a. 3 factors extracted. 10 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
143.799	18	.000

Pattern Matrix[a]

	Factor		
	1	2	3
X1	-6.36E-02	.599	2.497E-02
X2	-2.52E-03	.530	2.398E-03
X3	.183	.246	.353
X4	.279	1.542E-02	.445
X5	-1.62E-02	.747	2.458E-02
X6	-5.08E-02	7.407E-02	.585
X7	-3.23E-02	-8.50E-02	.765
X8	.637	.101	5.798E-02
X9	.762	-.109	1.351E-02
X10	.381	.452	-5.15E-02

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Structure Matrix

	Factor		
	1	2	3
X1	.154	.586	.214
X2	.182	.530	.191
X3	.410	.436	.515
X4	.463	.271	.562
X5	.252	.750	.285
X6	.210	.266	.591
X7	.245	.178	.721
X8	.695	.342	.350
X9	.730	.160	.281
X10	.517	.566	.263

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

Factor Correlation Matrix

Factor	1	2	3
1	1.000	.346	.402
2	.346	1.000	.358
3	.402	.358	1.000

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

4-Factor Unrotated Solution

Communalities[a]

	Initial	Extraction
X1	.254	.350
X2	.211	.279
X3	.373	.408
X4	.387	.921
X5	.363	.572
X6	.276	.999
X7	.305	.309
X8	.373	.581
X9	.315	.475
X10	.347	.459

Extraction Method: Maximum Likelihood.

[a] One or more communalitiy estimates greater than 1.0 were encountered during iterations. The resulting solution should be interpreted with caution.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.342	33.422	33.422	1.567	15.674	15.674
2	1.437	14.367	47.788	1.692	16.917	32.591
3	1.173	11.733	59.521	1.393	13.926	46.517
4	.890	8.904	68.425	.701	7.013	53.530
5	.682	6.821	75.246			
6	.616	6.165	81.411			
7	.566	5.662	87.073			
8	.461	4.613	91.685			
9	.433	4.330	96.015			
10	.398	3.985	100.000			

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

	Factor			
	1	2	3	4
X1	.172	.126	.475	-.281
X2	.150	.161	.423	-.226
X3	.278	.534	.193	-9.18E-02
X4	.238	.920	-.136	-3.12E-02
X5	.198	.276	.571	-.361
X6	.999	-3.83E-03	-6.79E-04	-9.25E-07
X7	.474	.288	-2.59E-02	2.109E-02
X8	.262	.350	.438	.445
X9	.117	.404	.269	.476
X10	.191	.273	.584	8.211E-02

Extraction Method: Maximum Likelihood.

a. 4 factors extracted. 24 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
16.611	11	.120