CHAPTER 6: FACTOR ANALYSIS

Analysis of subject scores data

2-Factor Unrotated Solution

Communalities

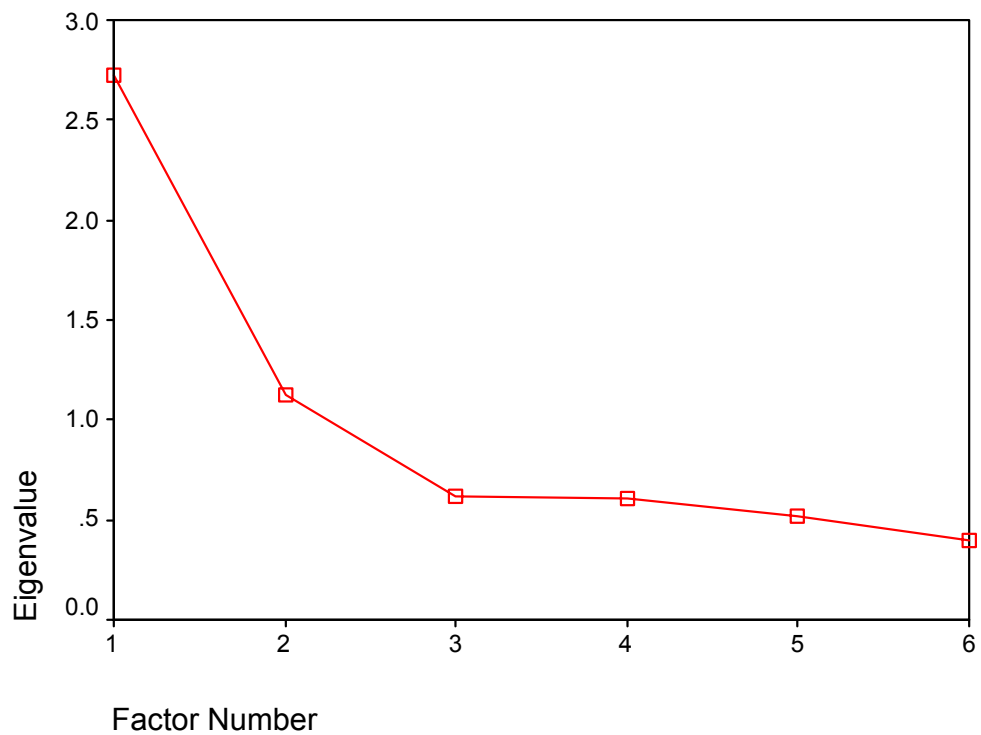|	Initial	Extraction
GAELIC	.302	.492
ENGLISH	.296	.405
HISTORY	.206	.356
ARITH	.415	.623
ALGEBRA	.412	.560
GEO	.295	.372

Extraction Method: Maximum Likelihood.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.729	45.478	45.478	2.204	36.731	36.731
2	1.129	18.813	64.291	.603	10.057	46.788
3	.615	10.255	74.546			
4	.603	10.047	84.593			
5	.523	8.709	93.302			
6	.402	6.698	100.000			

Extraction Method: Maximum Likelihood.

Scree Plot

Factor Matrix[a]

	Factor	
	1	2
GAELIC	.558	.425
ENGLISH	.569	.286
HISTORY	.392	.450
ARITH	.738	-.279
ALGEBRA	.718	-.209
GEO	.595	-.133

Extraction Method: Maximum Likelihood.

a. 2 factors extracted. 5 iterations required.
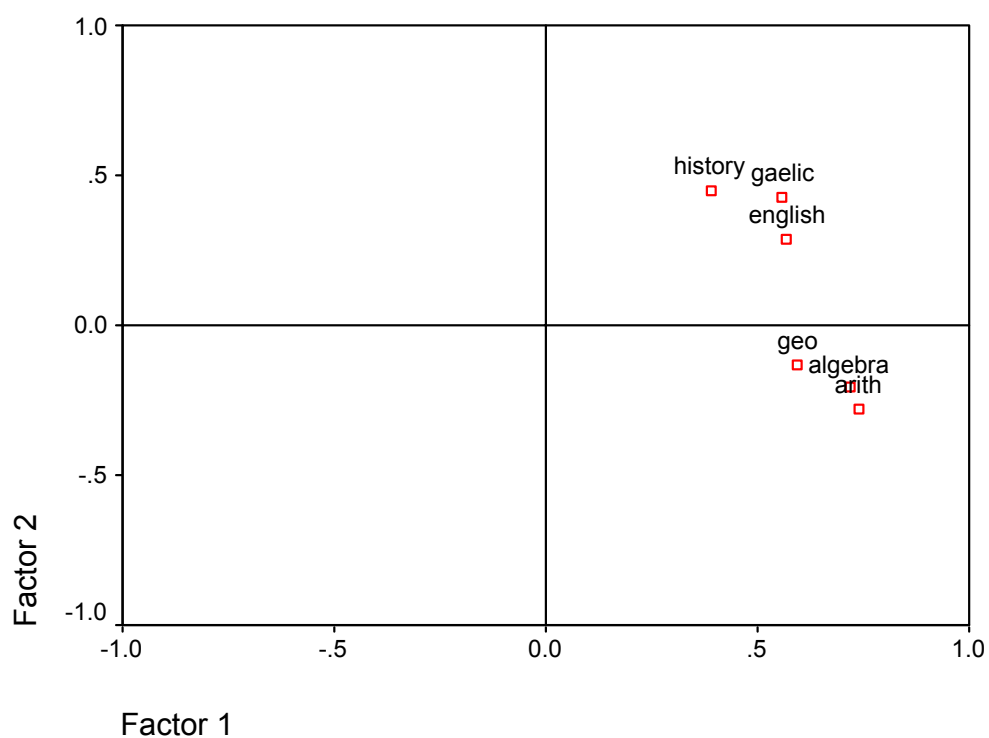
Goodness-of-fit Test

Chi-Square	df	Sig.
2.180	4	.703

Reproduced Correlations

		GAELIC	ENGLISH	HISTORY	ARITH	ALGEBRA	GEO
Reproduced Correlation	GAELIC	.492[b]	.439	.410	.293	.312	.275
	ENGLISH	.439	.405[b]	.352	.340	.349	.300
	HISTORY	.410	.352	.356[b]	.164	.188	.173
	ARITH	.293	.340	.164	.623[b]	.589	.476
	ALGEBRA	.312	.349	.188	.589	.560[b]	.455
	GEO	.275	.300	.173	.476	.455	.372[b]
Residual[a]	GAELIC		1.172E-03	1.807E-04	-3.15E-03	1.771E-02	-2.53E-02
	ENGLISH	1.172E-03		-1.72E-03	9.904E-03	-2.92E-02	2.960E-02
	HISTORY	1.807E-04	-1.72E-03		-3.98E-03	1.884E-03	6.503E-03
	ARITH	-3.15E-03	9.904E-03	-3.98E-03		1.442E-03	-6.28E-03
	ALGEBRA	1.771E-02	-2.92E-02	1.884E-03	1.442E-03		4.779E-03
	GEO	-2.53E-02	2.960E-02	6.503E-03	-6.28E-03	4.779E-03	

Extraction Method: Maximum Likelihood.

a. Residuals are computed between observed and reproduced correlations. There are 0 (.0%) nonredundant residuals with absolute values > 0.05.

b. Reproduced communalities

Factor Plot

Factor Score Coefficient Matrix

	Factor	
	1	2
GAELIC	.197	.390
ENGLISH	.172	.225
HISTORY	.109	.326
ARITH	.351	-.346
ALGEBRA	.293	-.221
GEO	.170	-.099

Extraction Method: Maximum Likelihood.

Factor Score Covariance Matrix

Factor	1	2
1	.821	2.546E-16
2	2.546E-16	.533

Extraction Method: Maximum Likelihood.

2-Factor OBLIMIN rotated solution

Communalities

	Initial	Extraction
GAELIC	.302	.492
ENGLISH	.296	.405
HISTORY	.206	.356
ARITH	.415	.623
ALGEBRA	.412	.560
GEO	.295	.372

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	2.729	45.478	45.478	2.204	36.731	36.731	1.979
2	1.129	18.813	64.291	.603	10.057	46.788	1.639
3	.615	10.255	74.546				
4	.603	10.047	84.593				
5	.523	8.709	93.302				
6	.402	6.698	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
GAELIC	.558	.425
ENGLISH	.569	.286
HISTORY	.392	.450
ARITH	.738	-.279
ALGEBRA	.718	-.209
GEO	.595	-.133

Extraction Method: Maximum Likelihood.

a. 2 factors extracted. 5 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
2.180	4	.703

Pattern Matrix[a]

	Factor	
	1	2
GAELIC	6.087E-02	.668
ENGLISH	.191	.517
HISTORY	-8.90E-02	.638
ARITH	.815	-5.23E-02
ALGEBRA	.738	1.953E-02
GEO	.577	6.008E-02

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

a. Rotation converged in 5 iterations.

Structure Matrix

	Factor	
	1	2
GAELIC	.405	.699
ENGLISH	.457	.615
HISTORY	.239	.592
ARITH	.788	.367
ALGEBRA	.748	.399
GEO	.607	.357

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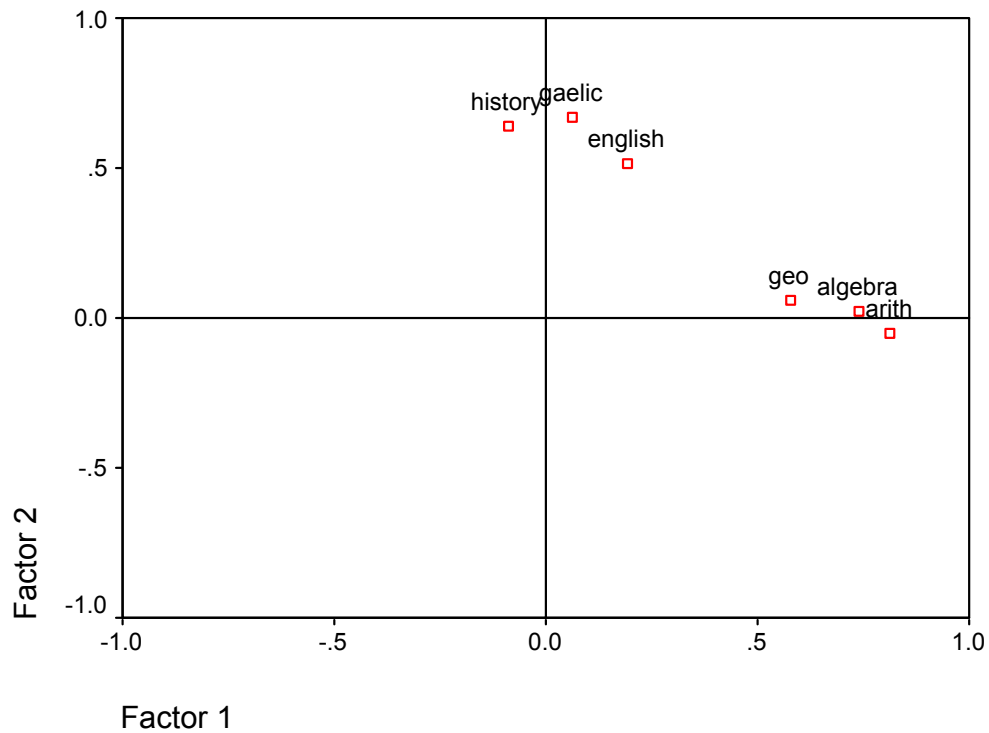Rotation Method: Oblimin with Kaiser Normalization.

Factor Correlation Matrix

Factor	1	2
1	1.000	.515
2	.515	1.000

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

Factor Plot in Rotated Factor Space

Factor Score Coefficient Matrix

	Factor	
	1	2
GAELIC	.071	.406
ENGLISH	.096	.277
HISTORY	.006	.298
ARITH	.439	.033
ALGEBRA	.346	.072
GEO	.192	.061

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

Factor Score Covariance Matrix

Factor	1	2
1	1.473	1.373
2	1.373	1.372

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