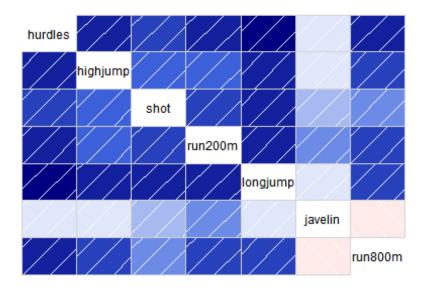
Dimension_Reduction.R

Fiona

Fri Oct 13 16:12:12 2017

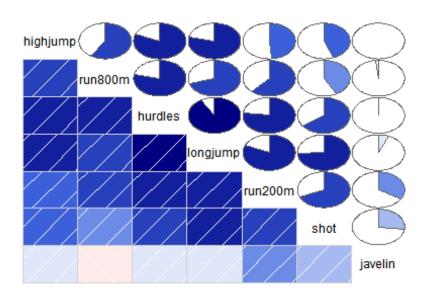
```
hep <- read.csv("C:/Users/Fiona/Desktop/Business Analytics and Decision</pre>
Sciences/Forecasting and Business Analytics/FABA-L4-Notes/hep88.csv",
header=TRUE)
hep$hurdles <- max(hep$hurdles) -
                                  hep$hurdles
hep$run200m <- max(hep$run200m) -
                                  hep$run200m
hep$run800m <- max(hep$run800m) - hep$run800m</pre>
# cor matrix - rounded to 3DP
round(cor(hep[2:8]), 3)
           hurdles highjump shot run200m longjump javelin run800m
## hurdles
             1.000
                      0.811 0.651
                                    0.774
                                             0.912
                                                     0.008
                                                             0.779
## highjump
             0.811
                      1.000 0.441
                                    0.488
                                             0.782
                                                     0.002
                                                             0.591
## shot
             0.651
                      0.441 1.000
                                    0.683
                                             0.743
                                                     0.269
                                                             0.420
## run200m
             0.774
                                             0.817
                      0.488 0.683
                                    1.000
                                                     0.333
                                                             0.617
## longjump
             0.912
                      0.782 0.743
                                             1.000
                                                     0.067
                                    0.817
                                                             0.700
## javelin
             0.008
                      0.002 0.269
                                    0.333
                                             0.067
                                                     1.000
                                                            -0.020
## run800m
                      0.591 0.420
                                             0.700
                                                   -0.020
                                                             1.000
             0.779
                                    0.617
# get corrgram plots
#install.packages("corrgram")
library("corrgram")
## Warning: package 'corrgram' was built under R version 3.3.3
corrgram(hep[2:8], main="Corrgram of 1998 heptathlon data")
```

Corrgram of 1998 heptathlon data

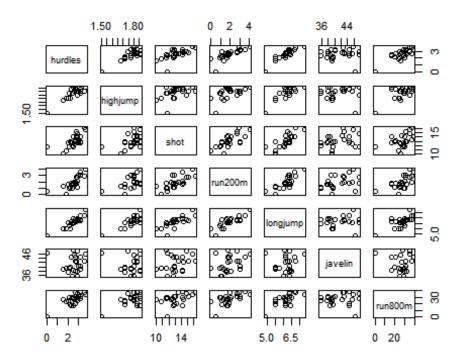


corrgram(hep[2:8], order=TRUE, upper.panel=panel.pie, main="Corrgram with
Pies ordered by PCA")

Corrgram with Pies ordered by PCA

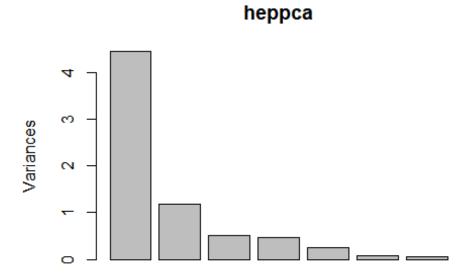


pairs plot pairs(hep[2:8])



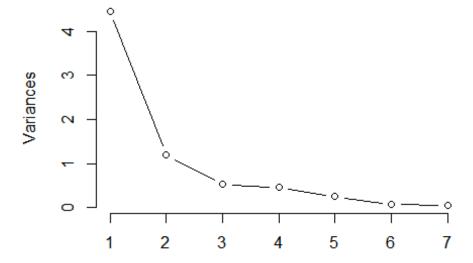
```
# PCA & scale to unit variance
heppca <- prcomp(hep[2:8], scale = TRUE)</pre>
summary(heppca)
## Importance of components:
##
                             PC1
                                    PC2
                                            PC3
                                                    PC4
                                                            PC5
                                                                    PC6
## Standard deviation
                          2.1119 1.0928 0.72181 0.67614 0.49524 0.27010
## Proportion of Variance 0.6372 0.1706 0.07443 0.06531 0.03504 0.01042
## Cumulative Proportion 0.6372 0.8078 0.88223 0.94754 0.98258 0.99300
##
                             PC7
## Standard deviation
                          0.2214
## Proportion of Variance 0.0070
## Cumulative Proportion 1.0000
heppca
## Standard deviations:
## [1] 2.1119364 1.0928497 0.7218131 0.6761411 0.4952441 0.2701029 0.2213617
##
## Rotation:
##
                   PC1
                               PC2
                                           PC3
                                                       PC4
                                                                    PC5
## hurdles -0.4528710 0.15792058 -0.04514996 0.02653873 -0.09494792
## highjump -0.3771992  0.24807386 -0.36777902  0.67999172  0.01879888
## shot -0.3630725 -0.28940743 0.67618919 0.12431725 0.51165201
```

```
## run200m -0.4078950 -0.26038545 0.08359211 -0.36106580 -0.64983404
## longjump -0.4562318 0.05587394 0.13931653 0.11129249 -0.18429810
## javelin -0.0754090 -0.84169212 -0.47156016 0.12079924 0.13510669
## run800m -0.3749594 0.22448984 -0.39585671 -0.60341130 0.50432116
##
                   PC6
                               PC7
## hurdles -0.78334101 0.38024707
## highjump 0.09939981 -0.43393114
## shot
           -0.05085983 -0.21762491
## run200m
            0.02495639 -0.45338483
## longjump 0.59020972 0.61206388
## javelin -0.02724076 0.17294667
## run800m
            0.15555520 -0.09830963
# get eiganvalues using SD2
heppca$sdev ^ 2
## [1] 4.46027516 1.19432056 0.52101413 0.45716683 0.24526674 0.07295558
## [7] 0.04900101
# scree plot (barplot)
plot(heppca)
```

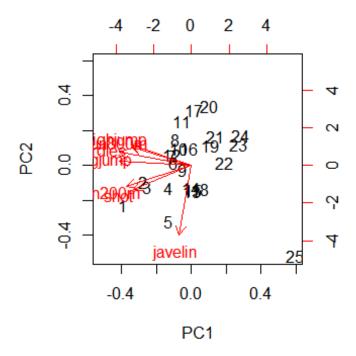


```
# normal scree plot (line)
plot(heppca, type="line")
```





PCA biplot
biplot(heppca)



Get scores heppca\$x ## PC1 PC2 PC3 PC4 PC5 ## [1,] -4.121447626 -1.24240435 0.36991309 0.02300174 -0.42600624 [2,] -2.882185935 -0.52372600 0.89741472 -0.47545176 0.70306588 ## ## [3,] -2.649633766 -0.67876243 -0.45917668 -0.67962860 -0.10552518 [4,] -1.343351210 -0.69228324 0.59527044 -0.14067052 0.45392816 [5,] -1.359025696 -1.75316563 -0.15070126 -0.83595001 0.68719483 ## [6,] -1.043847471 0.07940725 -0.67453049 -0.20557253 ## 0.73793351 ## ## [8,] -0.923173639 0.80681365 0.81241866 -0.03022915 0.09086737 [9,] -0.530250689 -0.14632191 0.16122744 0.61590242 0.56851477 ## [10,] -0.759819024 ## [13,] 0.015461226 -0.80644305 -1.96745373 0.73341733 -0.02177427 0.003774223 -0.71479785 -0.32496780 1.06604134 -0.18389959 ## [14,] ## [15,] 0.090747709 -0.76304501 -0.94571404 0.26883477 -0.18416945 ## [17,] 0.171128651 1.74319472 0.58701048 0.47103131 -0.05781435## [18,] 0.519252646 -0.72696476 -0.31302308 1.28942720 -0.49779301 ## [19,] ## [20,] 1.085697646 1.84722368 0.01452749 -0.25561691 0.19143514 0.92446876 -0.64596313 -0.21493997 0.49993839 ## [21,] 1.447055499 0.09304121 0.64802905 0.02454548 ## [22,] 2.014029620 0.24445870 ## [23,] 2.880298635 0.66150588 -0.74936718 -1.11903480 -0.47418755 ## [24,] 0.95961101 -0.57118753 -0.11547402 0.58055249 2.970118607 6.270021972 -2.83919926 1.03414797 -0.24141489 -0.16568672 ## [25,] ## PC6 PC7 0.339329222 0.347921325 [1,]## [2,] -0.238087298 0.144015774 ## [3,] 0.239190707 -0.129647756 ## [4,] -0.091805638 -0.486577968 ## [5,] -0.126303968 0.239482044 [6,] 0.355789386 -0.103414314 ## ## [7,] -0.084844490 -0.142871612 ## [8,] 0.151561253 0.034237928 ## [9,] -0.265359696 -0.249591589 ## [10,] -0.396397714 -0.020405097 [11,] 0.344582964 -0.182701990 ## [12,] -0.233718538 -0.070605615 ## [13,] 0.004249913 0.036155878 ## [14,] -0.272903729 0.044351160 ## [15,] -0.141403697 0.135136482 ## [16,] 0.280043639 -0.171160984 ## [17,] -0.147155606 0.520000710 ## [18,] 0.071211150 -0.005529394 ## [19,] 0.427484048 0.081522940

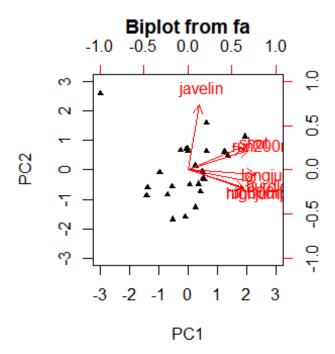
[20,] 0.100087033 0.085430091

```
## [21,] 0.072673266 -0.125585203
## [22,] -0.640572055 -0.215626046
## [23,] 0.180568513 -0.207364881
## [24,] -0.183940799 0.381783751
## [25,] 0.255722133 0.061044365
# using the principal functiuon in the psych package
#install.packages("psych")
#install.packages("GPArotation")
library(psych)
## Warning: package 'psych' was built under R version 3.3.3
library(GPArotation)
summary(prcomp(hep[2:8], scale = TRUE))
## Importance of components:
                                    PC2
                                            PC3
                                                    PC4
                                                            PC5
##
                             PC1
                                                                    PC6
## Standard deviation
                          2.1119 1.0928 0.72181 0.67614 0.49524 0.27010
## Proportion of Variance 0.6372 0.1706 0.07443 0.06531 0.03504 0.01042
## Cumulative Proportion 0.6372 0.8078 0.88223 0.94754 0.98258 0.99300
                             PC7
## Standard deviation
                          0.2214
## Proportion of Variance 0.0070
## Cumulative Proportion 1.0000
heppca2 <- principal(hep[2:8], nfactors = 2, rotate="none")
heppca2 # see the output is the same as usuing the prcomp function
## Principal Components Analysis
## Call: principal(r = hep[2:8], nfactors = 2, rotate = "none")
## Standardized loadings (pattern matrix) based upon correlation matrix
             PC1
                   PC2
                         h2
                               u2 com
## hurdles 0.96 -0.17 0.94 0.055 1.1
## highjump 0.80 -0.27 0.71 0.292 1.2
## shot
            0.77 0.32 0.69 0.312 1.3
## run200m 0.86 0.28 0.82 0.177 1.2
## longjump 0.96 -0.06 0.93 0.068 1.0
## javelin 0.16 0.92 0.87 0.129 1.1
## run800m 0.79 -0.25 0.69 0.313 1.2
##
##
                          PC1 PC2
## SS loadings
                         4.46 1.19
## Proportion Var
                         0.64 0.17
## Cumulative Var
                         0.64 0.81
## Proportion Explained 0.79 0.21
## Cumulative Proportion 0.79 1.00
## Mean item complexity = 1.2
## Test of the hypothesis that 2 components are sufficient.
```

```
## The root mean square of the residuals (RMSR) is 0.07
## with the empirical chi square 5.31 with prob < 0.72
##
## Fit based upon off diagonal values = 0.99

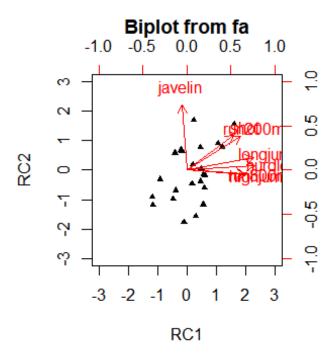
# h2 = the amount of variance in each variable explained by the components.
# u2 = component uniqueness, i.e. the amount of variance not accounted for by the components.

# get biplot
biplot(heppca2)</pre>
```



```
# Using varimax to get components
principal(hep[2:8], nfactors = 2, rotate="varimax")
## Principal Components Analysis
## Call: principal(r = hep[2:8], nfactors = 2, rotate = "varimax")
## Standardized loadings (pattern matrix) based upon correlation matrix
##
              RC1
                   RC2
                         h2
                               u2 com
## hurdles
            0.97 0.06 0.94 0.055 1.0
## highjump 0.84 -0.07 0.71 0.292 1.0
## shot
            0.67 0.49 0.69 0.312 1.8
## run200m
            0.77 0.48 0.82 0.177 1.7
## longjump 0.95 0.17 0.93 0.068 1.1
## javelin -0.07 0.93 0.87 0.129 1.0
## run800m
            0.83 -0.05 0.69 0.313 1.0
##
```

```
##
                          RC1 RC2
## SS loadings
                         4.27 1.39
## Proportion Var
                         0.61 0.20
## Cumulative Var
                         0.61 0.81
## Proportion Explained 0.76 0.24
## Cumulative Proportion 0.76 1.00
##
## Mean item complexity = 1.2
## Test of the hypothesis that 2 components are sufficient.
##
## The root mean square of the residuals (RMSR) is 0.07
## with the empirical chi square 5.31 with prob < 0.72
##
## Fit based upon off diagonal values = 0.99
biplot(principal(hep[2:8], nfactors = 2, rotate="varimax"))
```



```
# Using promax to get components
principal(hep[2:8], nfactors = 2, rotate="promax")

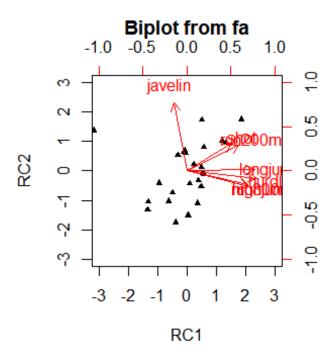
## Principal Components Analysis
## Call: principal(r = hep[2:8], nfactors = 2, rotate = "promax")

## Standardized loadings (pattern matrix) based upon correlation matrix
## RC1 RC2 h2 u2 com

## hurdles 1.00 -0.10 0.94 0.055 1.0

## highjump 0.88 -0.22 0.71 0.292 1.1
## shot 0.63 0.39 0.69 0.312 1.7
```

```
## run200m
            0.73 0.37 0.82 0.177 1.5
## longjump
            0.96
                 0.02 0.93 0.068 1.0
            -0.19
                  0.97 0.87 0.129 1.1
## javelin
## run800m
             0.86 -0.19 0.69 0.313 1.1
##
##
                          RC1 RC2
## SS loadings
                         4.37 1.29
## Proportion Var
                         0.62 0.18
## Cumulative Var
                         0.62 0.81
## Proportion Explained 0.77 0.23
## Cumulative Proportion 0.77 1.00
##
   With component correlations of
##
##
        RC1 RC2
## RC1 1.00 0.28
## RC2 0.28 1.00
##
## Mean item complexity = 1.2
## Test of the hypothesis that 2 components are sufficient.
##
## The root mean square of the residuals (RMSR) is 0.07
  with the empirical chi square 5.31 with prob < 0.72
##
## Fit based upon off diagonal values = 0.99
biplot(principal(hep[2:8], nfactors = 2, rotate="promax"))
```



Get scores heppca2\$scores ## PC1 PC2 ## [1,]1.951501816 1.13684829 0.47922965 ## [2,] 1.364712498 ## [3,] 1.254599251 0.62109401 ## [4,] 0.636075613 0.63346607 ## [5,] 0.643497468 1.60421471 ## [6,] 0.494260857 -0.07266072 ## [7,] 0.521031629 -0.29624661 ## [8,] 0.437121904 -0.73826586 ## [9,] 0.251073233 0.13389024 ## [10,] 0.359773638 -0.48132480 ## [11,] 0.263392550 -1.27765212 ## [12,] 0.561784843 -0.32370952 ## [13,] -0.007320877 0.73792674 ## [14,] -0.001787091 0.65406782 ## [15,] -0.042968960 0.69821585 ## [16,] 0.064976125 -0.49159598 ## [17,] -0.081029266 -1.59509094 ## [18,] -0.245865670 0.66520101 ## [19,] -0.532914655 -0.58085789 ## [20,] -0.514076878 -1.69028148 ## [21,] -0.685179502 -0.84592486 ## [22,] -0.953641249 -0.08513632 ## [23,] -1.363818863 -0.60530360 ## [24,] -1.406348540 -0.87808138 ## [25,] -2.968849873 2.59797770 # show covariance data Harman74.cor ## \$cov VisualPerception Cubes PaperFormBoard Flags ## ## VisualPerception 1.000 0.318 0.403 0.468 ## Cubes 0.317 0.230 0.318 1.000 ## PaperFormBoard 0.403 0.317 1.000 0.305 ## Flags 0.468 0.230 0.305 1.000 ## GeneralInformation 0.321 0.285 0.247 0.227 ## PargraphComprehension 0.335 0.234 0.268 0.327 ## SentenceCompletion 0.304 0.157 0.223 0.335 ## WordClassification 0.332 0.157 0.382 0.391 ## WordMeaning 0.326 0.195 0.184 0.325 ## Addition 0.116 0.057 -0.075 0.099 ## Code 0.308 0.150 0.091 0.110 ## CountingDots 0.314 0.145 0.140 0.160 ## StraightCurvedCapitals 0.489 0.239 0.321 0.327

0.125 0.103

0.238 0.131

0.177 0.066

0.065 0.127

WordRecognition

NumberRecognition

##	FigureRecognition	0.414 0.	272 0.263	0.322
##	ObjectNumber	0.176 0.	005 0.177	0.187
##	NumberFigure	0.368 0.	255 0.211	0.251
##	FigureWord	0.270 0.	0.312	0.137
##	Deduction	0.365 0.	292 0.297	0.339
##	NumericalPuzzles	0.369 0.	306 0.165	0.349
##	ProblemReasoning	0.413 0.	232 0.250	0.380
	SeriesCompletion	0.474 0.	348 0.383	0.335
	ArithmeticProblems	0.282 0.	211 0.203	0.248
##		GeneralInformation		
##	VisualPerception	0.321	0.3	35
##	Cubes	0.285	0.2	.34
##	PaperFormBoard	0.247	0.2	.68
	Flags	0.227	0.3	27
	GeneralInformation	1.000	0.6	522
	PargraphComprehension	0.622	1.0	
	SentenceCompletion	0.656	0.7	
	WordClassification	0.578	0.5	
	WordMeaning	0.723	0.7	
	Addition	0.311	0.2	
	Code	0.344	0.3	
	CountingDots	0.215	0.0	
	StraightCurvedCapitals	0.344	0.3	
	WordRecognition	0.280	0.2	
	NumberRecognition	0.229	0.2	
	FigureRecognition	0.187	0.2	
	ObjectNumber	0.208	0.2	
	NumberFigure	0.263	0.1	
	FigureWord	0.190	0.2	
	Deduction	0.398	0.4	
	NumericalPuzzles	0.318	0.2	
	ProblemReasoning	0.441	0.3	
	SeriesCompletion	0.435	0.4	
	ArithmeticProblems		0.4	
	Arithmeticarobiems	0.420		
##	Visual Dancontion	SentenceCompletion 0.304	0.332	0.326
	VisualPerception			
	Cubes	0.157	0.157	0.195
	PaperFormBoard	0.223	0.382	0.184
	Flags	0.335	0.391	0.325
	GeneralInformation	0.656	0.578	0.723
	PargraphComprehension	0.722	0.527	0.714
	SentenceCompletion	1.000	0.619	0.685
	WordClassification	0.619	1.000	0.532
	WordMeaning	0.685	0.532	1.000
	Addition	0.246	0.285	0.170
	Code	0.232	0.300	0.280
	CountingDots	0.181	0.271	0.113
	StraightCurvedCapitals	0.345	0.395	0.280
	WordRecognition	0.236	0.252	0.260
##	NumberRecognition	0.172	0.175	0.248

	FigureRecognition			180		.296	0.242
	ObjectNumber			228		. 255	0.274
##	NumberFigure			159		. 250	0.208
##	FigureWord			226		. 274	0.274
	Deduction			451	0	.427	0.446
##	NumericalPuzzles		0.	314	0	. 362	0.266
	ProblemReasoning		0.	396		. 357	0.483
##	SeriesCompletion		0.	405	0	.501	0.504
##	ArithmeticProblems			437		. 388	0.424
##		Addition		CountingDots	Strai	ghtCurvedCa	-
##	VisualPerception	0.116		0.314			0.489
	Cubes	0.057		0.145			0.239
##	PaperFormBoard	-0.075		0.140			0.321
	Flags	0.099	0.110	0.160			0.327
	GeneralInformation	0.311		0.215			0.344
	PargraphComprehension	0.203	0.353	0.095			0.309
	SentenceCompletion	0.246		0.181			0.345
	WordClassification	0.285		0.271			0.395
	WordMeaning	0.170		0.113			0.280
##	Addition	1.000	0.484	0.585			0.408
	Code	0.484		0.428			0.535
	CountingDots	0.585	0.428	1.000			0.512
	StraightCurvedCapitals	0.408		0.512			1.000
	WordRecognition	0.172		0.131			0.195
##	NumberRecognition	0.154		0.173			0.139
##	FigureRecognition	0.124		0.119			0.281
##	ObjectNumber	0.289		0.278			0.194
	NumberFigure	0.317		0.349			0.323
	FigureWord		0.290	0.110			0.263
	Deduction	0.173		0.246			0.241
	NumericalPuzzles	0.405		0.355			0.425
	ProblemReasoning	0.160		0.193			0.279
	SeriesCompletion	0.262		0.350			0.382
	ArithmeticProblems	0.531		0.414	• . •		0.358
##	v: 15 · · ·	WordReco	-	NumberRecogn		FigureReco	_
	VisualPerception		0.125		0.238		0.414
	Cubes		0.103		0.131		0.272
	PaperFormBoard		0.177		0.065		0.263
	Flags		0.066		0.127		0.322
	GeneralInformation		0.280		0.229		0.187
	PargraphComprehension		0.292		0.251		0.291
	SentenceCompletion		0.236		0.172		0.180
	WordClassification		0.252		0.175		0.296
	WordMeaning		0.260		0.248		0.242
	Addition		0.172		0.154		0.124
	Code		0.350		0.240		0.314
	CountingDots		0.131		0.173		0.119
	StraightCurvedCapitals		0.195		0.139		0.281
	WordRecognition		1.000		0.370		0.412
##	NumberRecognition		0.370		1.000		0.325

	FigureRecognition	0.412		0.325	1.000
	ObjectNumber	0.341		0.345	0.324
##	NumberFigure	0.201		0.334	0.344
	FigureWord	0.206		0.192	0.258
##	Deduction	0.302		0.272	0.388
##	NumericalPuzzles	0.183		0.232	0.348
##	ProblemReasoning	0.243		0.246	0.283
##	SeriesCompletion	0.242		0.256	0.360
##	ArithmeticProblems	0.304		0.165	0.262
##		ObjectNumber Numb	perFigure	FigureWord	Deduction
##	VisualPerception	0.176	0.368	0.270	0.365
##	Cubes	0.005	0.255	0.112	0.292
##	PaperFormBoard	0.177	0.211	0.312	0.297
##	Flags	0.187	0.251	0.137	0.339
##	GeneralInformation	0.208	0.263	0.190	0.398
##	PargraphComprehension	0.273	0.167	0.251	0.435
##	SentenceCompletion	0.228	0.159	0.226	0.451
##	WordClassification	0.255	0.250	0.274	0.427
##	WordMeaning	0.274	0.208	0.274	0.446
##	Addition	0.289	0.317	0.190	0.173
##	Code	0.362	0.350	0.290	0.202
##	CountingDots	0.278	0.349	0.110	0.246
##	StraightCurvedCapitals	0.194	0.323	0.263	0.241
	WordRecognition	0.341	0.201	0.206	0.302
##	NumberRecognition	0.345	0.334	0.192	0.272
##	FigureRecognition	0.324	0.344	0.258	0.388
##	ObjectNumber	1.000	0.448	0.324	0.262
##	NumberFigure	0.448	1.000	0.358	0.301
##	FigureWord	0.324	0.358	1.000	0.167
##	Deduction	0.262	0.301	0.167	1.000
##	NumericalPuzzles	0.173	0.357	0.331	0.413
##	ProblemReasoning	0.273	0.317	0.342	0.463
##	SeriesCompletion	0.287	0.272	0.303	0.509
##	ArithmeticProblems	0.326	0.405	0.374	0.366
##		NumericalPuzzles	ProblemRe	easoning Ser	riesCompletion
##	VisualPerception	0.369		0.413	0.474
##	Cubes	0.306		0.232	0.348
##	PaperFormBoard	0.165		0.250	0.383
##	Flags	0.349		0.380	0.335
	GeneralInformation	0.318		0.441	0.435
	PargraphComprehension	0.263		0.386	0.431
##	SentenceCompletion	0.314		0.396	0.405
##	WordClassification	0.362		0.357	0.501
##	WordMeaning	0.266		0.483	0.504
##	Addition	0.405		0.160	0.262
	Code	0.399		0.304	0.251
##	CountingDots	0.355		0.193	0.350
##	${\tt StraightCurvedCapitals}$	0.425		0.279	0.382
##	WordRecognition	0.183		0.243	0.242
##	NumberRecognition	0.232		0.246	0.256

```
## FigureRecognition
                                     0.348
                                                      0.283
                                                                        0.360
## ObjectNumber
                                     0.173
                                                      0.273
                                                                        0.287
## NumberFigure
                                     0.357
                                                      0.317
                                                                        0.272
## FigureWord
                                                      0.342
                                     0.331
                                                                       0.303
## Deduction
                                     0.413
                                                      0.463
                                                                       0.509
## NumericalPuzzles
                                     1.000
                                                      0.374
                                                                       0.451
## ProblemReasoning
                                     0.374
                                                      1.000
                                                                       0.503
## SeriesCompletion
                                     0.451
                                                      0.503
                                                                        1.000
## ArithmeticProblems
                                     0.448
                                                      0.375
                                                                        0.434
##
                          ArithmeticProblems
## VisualPerception
                                       0.282
## Cubes
                                       0.211
## PaperFormBoard
                                       0.203
## Flags
                                       0.248
## GeneralInformation
                                       0.420
## PargraphComprehension
                                       0.433
## SentenceCompletion
                                       0.437
## WordClassification
                                       0.388
## WordMeaning
                                       0.424
## Addition
                                       0.531
## Code
                                       0.412
## CountingDots
                                       0.414
## StraightCurvedCapitals
                                       0.358
## WordRecognition
                                       0.304
## NumberRecognition
                                       0.165
## FigureRecognition
                                       0.262
## ObjectNumber
                                       0.326
## NumberFigure
                                       0.405
## FigureWord
                                       0.374
## Deduction
                                       0.366
## NumericalPuzzles
                                       0.448
## ProblemReasoning
                                       0.375
## SeriesCompletion
                                       0.434
## ArithmeticProblems
                                       1.000
##
## $center
   ##
##
## $n.obs
## [1] 145
# convert covariance to correlations
correlations <- cov2cor(Harman74.cor$cov)</pre>
correlations
##
                          VisualPerception Cubes PaperFormBoard Flags
## VisualPerception
                                     1.000 0.318
                                                          0.403 0.468
## Cubes
                                     0.318 1.000
                                                          0.317 0.230
## PaperFormBoard
                                     0.403 0.317
                                                          1.000 0.305
## Flags
                                     0.468 0.230
                                                          0.305 1.000
```

	GeneralInformation PangnaphCompnehonsion	0.321 0.		7 0.227
	PargraphComprehension	0.335 0.		8 0.327
	SentenceCompletion	0.304 0.		3 0.335
	WordClassification	0.332 0.		2 0.391
	WordMeaning	0.326 0.		4 0.325
	Addition	0.116 0.		5 0.099
	Code	0.308 0.		1 0.110
	CountingDots	0.314 0.		0.160
	StraightCurvedCapitals	0.489 0.		1 0.327
	WordRecognition	0.125 0.		7 0.066
	NumberRecognition	0.238 0.		5 0.127
	FigureRecognition	0.414 0.		3 0.322
	ObjectNumber	0.176 0.		7 0.187
	NumberFigure	0.368 0.		1 0.251
	FigureWord	0.270 0.		2 0.137
	Deduction	0.365 0.		7 0.339
	NumericalPuzzles	0.369 0.		5 0.349
	ProblemReasoning	0.413 0.		0.380
	SeriesCompletion	0.474 0.		3 0.335
	ArithmeticProblems	0.282 0.		3 0.248
##		GeneralInformation		
	VisualPerception	0.321		.335
	Cubes	0.285		. 234
	PaperFormBoard	0.247		. 268
	Flags	0.227		.327
	GeneralInformation	1.000		.622
	PargraphComprehension	0.622		.000
	SentenceCompletion	0.656		.722
	WordClassification	0.578		.527
	WordMeaning	0.723		.714
	Addition	0.311		. 203
	Code	0.344		.353
	CountingDots	0.215		.095
	StraightCurvedCapitals	0.344		. 309
	WordRecognition	0.280		. 292
	NumberRecognition	0.229		. 251
	FigureRecognition	0.187		.291
	ObjectNumber	0.208		.273
	S	0.263		.167
	FigureWord	0.190		. 251
	Deduction	0.398		.435
	NumericalPuzzles	0.318		.263
	ProblemReasoning	0.441		.386
	SeriesCompletion	0.435		.431
	ArithmeticProblems	0.420		.433
##		SentenceCompletion		•
	VisualPerception	0.304	0.33	
	Cubes	0.157	0.15	
	PaperFormBoard	0.223	0.38	
##	Flags	0.335	0.39	1 0.325

	GeneralInformation			.656	0.	578	0.723
	PargraphComprehension			.722			0.714
	SentenceCompletion			.000			0.685
	WordClassification			.619			0.532
	WordMeaning			.685			1.000
	Addition			. 246			0.170
	Code			. 232			0.280
	CountingDots			.181			0.113
	StraightCurvedCapitals			.345			0.280
	WordRecognition			.236			0.260
	NumberRecognition			.172			0.248
##	FigureRecognition			.180			0.242
	3			.228			0.274
	NumberFigure			.159			0.208
##	FigureWord Deduction			.226			0.274
	NumericalPuzzles			.451 .314			0.446
				.314 .396			0.266 0.483
	ProblemReasoning SeriesCompletion			. 405			0.463 0.504
	ArithmeticProblems			. 405 . 437			0.304 0.424
##	Al Ithmeticri obiems	Addition		CountingDots			
	VisualPerception		0.308	0.314	3 Clarg	iiccui veuca	0.489
	Cubes		0.150	0.145			0.239
	PaperFormBoard	-0.075		0.140			0.321
	Flags		0.110	0.160			0.327
##	GeneralInformation		0.344	0.215			0.344
	PargraphComprehension		0.353	0.095			0.309
	SentenceCompletion		0.232	0.181			0.345
	WordClassification		0.300	0.271			0.395
##	WordMeaning	0.170	0.280	0.113			0.280
##	Addition	1.000	0.484	0.585			0.408
##	Code	0.484	1.000	0.428			0.535
##	CountingDots	0.585	0.428	1.000			0.512
##	StraightCurvedCapitals	0.408	0.535	0.512			1.000
##	WordRecognition	0.172	0.350	0.131			0.195
##	NumberRecognition		0.240	0.173			0.139
	FigureRecognition	0.124	0.314	0.119			0.281
	ObjectNumber		0.362	0.278			0.194
	NumberFigure		0.350	0.349			0.323
	FigureWord		0.290	0.110			0.263
	Deduction		0.202	0.246			0.241
	NumericalPuzzles		0.399	0.355			0.425
	ProblemReasoning		0.304	0.193			0.279
	SeriesCompletion		0.251	0.350			0.382
	ArithmeticProblems		0.412	0.414		F: B	0.358
##	Winner 1 Danie and the second	worakeco	-	n NumberRecogn		rigureReco	_
	VisualPerception		0.12		0.238		0.414
	Cubes		0.10		0.131		0.272
	PaperFormBoard		0.17		0.065		0.263
##	Flags		0.06	J	0.127		0.322

	GeneralInformation	0.280	0.229	0.187
	PargraphComprehension	0.292	0.251	0.291
	SentenceCompletion	0.236	0.172	0.180
	WordClassification	0.252	0.175	0.296
	WordMeaning	0.260	0.248	0.242
	Addition	0.172	0.154	0.124
	Code	0.350	0.240	0.314
	CountingDots	0.131	0.173	0.119
	StraightCurvedCapitals	0.195	0.139	0.281
	WordRecognition	1.000	0.370	0.412
	NumberRecognition	0.370	1.000	0.325
	FigureRecognition	0.412	0.325	1.000
	ObjectNumber	0.341	0.345	0.324
	3	0.201	0.334	0.344
	FigureWord	0.206	0.192	0.258
	Deduction	0.302	0.272	0.388
	NumericalPuzzles	0.183	0.232	0.348
	ProblemReasoning	0.243	0.246	0.283
	SeriesCompletion	0.242	0.256	0.360
	ArithmeticProblems	0.304	0.165	0.262
##		ObjectNumber Number	_	
	VisualPerception	0.176	0.368 0.270	0.365
##	Cubes	0.005	0.255 0.112	0.292
	PaperFormBoard	0.177	0.211 0.312	0.297
	Flags	0.187	0.251 0.137	0.339
	GeneralInformation	0.208	0.263 0.190	0.398
	PargraphComprehension	0.273	0.167 0.251	0.435
	SentenceCompletion	0.228	0.159 0.226	0.451
	WordClassification	0.255	0.250 0.274	0.427
	WordMeaning	0.274	0.208 0.274	0.446
	Addition	0.289	0.317 0.190	0.173
##	Code	0.362	0.350 0.290	0.202
	CountingDots	0.278	0.349 0.110	0.246
	StraightCurvedCapitals	0.194	0.323 0.263	0.241
##	WordRecognition	0.341	0.201 0.206	0.302
##	NumberRecognition	0.345	0.334 0.192	0.272
	FigureRecognition	0.324	0.344 0.258	0.388
	ObjectNumber	1.000	0.448 0.324	0.262
##	NumberFigure	0.448	1.000 0.358	0.301
	FigureWord	0.324	0.358 1.000	0.167
	Deduction	0.262	0.301 0.167	1.000
	NumericalPuzzles	0.173	0.357 0.331	0.413
	ProblemReasoning	0.273	0.317 0.342	0.463
##	SeriesCompletion	0.287	0.272 0.303	0.509
	ArithmeticProblems	0.326	0.405 0.374	0.366
##		NumericalPuzzles Pro		riesCompletion
##	VisualPerception	0.369	0.413	0.474
##	Cubes	0.306	0.232	0.348
##	PaperFormBoard	0.165	0.250	0.383
##	Flags	0.349	0.380	0.335

##	GeneralInformation	0.318	0.441	0.435
	PargraphComprehension	0.263	0.386	0.431
	SentenceCompletion	0.314	0.396	0.405
##	WordClassification	0.362	0.357	0.501
##	WordMeaning	0.266	0.483	0.504
##	Addition	0.405	0.160	0.262
##	Code	0.399	0.304	0.251
##	CountingDots	0.355	0.193	0.350
##	StraightCurvedCapitals	0.425	0.279	0.382
##	WordRecognition	0.183	0.243	0.242
##	NumberRecognition	0.232	0.246	0.256
##	FigureRecognition	0.348	0.283	0.360
##	ObjectNumber	0.173	0.273	0.287
##	NumberFigure	0.357	0.317	0.272
	FigureWord	0.331	0.342	0.303
	Deduction	0.413	0.463	0.509
##	NumericalPuzzles	1.000	0.374	0.451
	ProblemReasoning	0.374	1.000	0.503
	SeriesCompletion	0.451	0.503	1.000
	ArithmeticProblems	0.448	0.375	0.434
##		ArithmeticProblems		
	VisualPerception	0.282		
	Cubes	0.211		
	PaperFormBoard	0.203		
	Flags	0.248		
	GeneralInformation	0.420		
	PargraphComprehension	0.433		
	SentenceCompletion	0.437		
	WordClassification	0.388		
	WordMeaning	0.424		
	Addition	0.531		
	Code	0.412		
	CountingDots	0.414		
	StraightCurvedCapitals	0.358		
	WordRecognition	0.304		
	NumberRecognition	0.165		
	FigureRecognition	0.262		
	ObjectNumber	0.326		
	NumberFigure	0.405		
	FigureWord	0.374		
	Deduction	0.366		
	NumericalPuzzles	0.448		
	ProblemReasoning	0.375		
	SeriesCompletion	0.434		
	ArithmeticProblems	1.000		
##	ALTERIMECTOR LODIEMS	1.000		
# 1	Round to 3DP - still too	difficult to read!		
	und(correlations, 3)			
	, ,			

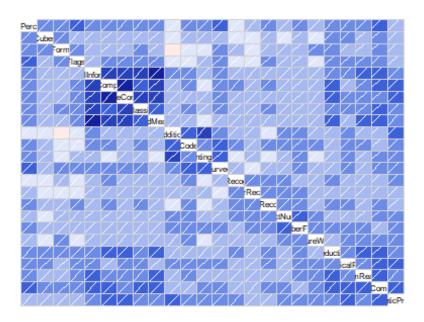
##			ubes PaperFormBoard	_
	VisualPerception	1.000 0		0.468
##	Cubes	0.318 1		0.230
	PaperFormBoard	0.403 0		0.305
	Flags	0.468 0		1.000
##	GeneralInformation	0.321 0	.285 0.247	0.227
	PargraphComprehension	0.335 0	.234 0.268	0.327
##	SentenceCompletion	0.304 0	.157 0.223	0.335
##	WordClassification	0.332 0	.157 0.382	0.391
##	WordMeaning	0.326 0	.195 0.184	0.325
##	Addition	0.116 0	.057 -0.075	0.099
##	Code	0.308 0	.150 0.091	0.110
##	CountingDots	0.314 0	.145 0.146	0.160
##	StraightCurvedCapitals	0.489 0	.239 0.321	0.327
##	WordRecognition	0.125 0	.103 0.177	0.066
##	NumberRecognition	0.238 0	.131 0.065	0.127
##	FigureRecognition	0.414 0	.272 0.263	0.322
##	ObjectNumber	0.176 0	.005 0.177	0.187
##	NumberFigure	0.368 0	.255 0.211	0.251
##	FigureWord	0.270 0	.112 0.312	0.137
##	Deduction	0.365 0	.292 0.297	0.339
##	NumericalPuzzles	0.369 0	.306 0.165	0.349
##	ProblemReasoning	0.413 0	.232 0.250	0.380
##	SeriesCompletion	0.474 0	.348 0.383	0.335
##	ArithmeticProblems	0.282 0	.211 0.203	0.248
##		GeneralInformation	PargraphComprehens	ion
	VisualPerception	GeneralInformation 0.321		ion 335
##	VisualPerception Cubes		0.	
## ##	-	0.321	0. 0.	335
## ## ## ##	Cubes PaperFormBoard Flags	0.321 0.285	0. 0. 0.	335 234
## ## ## ##	Cubes PaperFormBoard	0.321 0.285 0.247	0. 0. 0.	335 234 268
## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension	0.321 0.285 0.247 0.227	0. 0. 0. 0.	335 234 268 327
## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation	0.321 0.285 0.247 0.227 1.000	0. 0. 0. 0. 0.	335 234 268 327 622
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension	0.321 0.285 0.247 0.227 1.000 0.622	0. 0. 0. 0. 0. 1.	335 234 268 327 622 000
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion	0.321 0.285 0.247 0.227 1.000 0.622 0.656	0. 0. 0. 0. 1. 0.	335 234 268 327 622 000 722
## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578	0. 0. 0. 0. 1. 0.	335 234 268 327 622 000 722 527
## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311	0. 0. 0. 0. 1. 0. 0. 0.	335 234 268 327 622 000 722 527 714
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311	0. 0. 0. 0. 1. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311	0. 0. 0. 0. 1. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215	0. 0. 0. 0. 1. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095
## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215	0. 0. 0. 0. 1. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309
## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344	0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292
## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.280	0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292
## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.280 0.229	0. 0. 0. 0. 1. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251
## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.215 0.344	0. 0. 0. 0. 1. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251 291 273
## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.280 0.229 0.187 0.208	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251 291 273 167
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.215 0.349 0.280 0.229 0.187 0.208	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251 291 273 167 251
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles ProblemReasoning	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.280 0.229 0.187 0.208 0.263 0.190 0.398 0.318	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251 291 273 167 251 435
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.280 0.229 0.187 0.208 0.263 0.190 0.398 0.318	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251 291 273 167 251 435 263
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles ProblemReasoning	0.321 0.285 0.247 0.227 1.000 0.622 0.656 0.578 0.723 0.311 0.344 0.215 0.344 0.280 0.229 0.187 0.208 0.263 0.190 0.398 0.318	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	335 234 268 327 622 000 722 527 714 203 353 095 309 292 251 291 273 167 251 435 263 386

			_			
##		Sentence	-	ion WordClass		_
	VisualPerception			304	0.332	0.326
	Cubes			157	0.157	0.195
	PaperFormBoard			223	0.382	0.184
	Flags			335	0.391	0.325
	GeneralInformation			656	0.578	0.723
	PargraphComprehension			722	0.527	0.714
	SentenceCompletion			000	0.619	0.685
	WordClassification			619	1.000	0.532
	WordMeaning			685	0.532	1.000
	Addition			246	0.285	0.170
	Code			232	0.300	0.280
	CountingDots			181	0.271	0.113
	StraightCurvedCapitals			345	0.395	0.280
	WordRecognition			236	0.252	0.260
	NumberRecognition			172	0.175	0.248
	FigureRecognition			180	0.296	0.242
	ObjectNumber			228	0.255	0.274
	NumberFigure			159	0.250	0.208
	FigureWord			226	0.274	0.274
	Deduction			451	0.427	0.446
	NumericalPuzzles			314	0.362	0.266
	ProblemReasoning			396	0.357	0.483
	SeriesCompletion			405	0.501	0.504
##	ArithmeticProblems		0.4	437	0.388	0.424
##		Addition		_	StraightCu	urvedCapitals
##	VisualPerception	0.116	0.308	0.314	StraightCu	0.489
## ##	Cubes	0.116 0.057	0.308 0.150	0.314 0.145	StraightCu	0.489 0.239
## ## ##	Cubes PaperFormBoard	0.116 0.057 -0.075	0.308 0.150 0.091	0.314 0.145 0.140	StraightCu	0.489 0.239 0.321
## ## ## ##	Cubes PaperFormBoard Flags	0.116 0.057 -0.075 0.099	0.308 0.150 0.091 0.110	0.314 0.145 0.140 0.160	StraightCu	0.489 0.239 0.321 0.327
## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation	0.116 0.057 -0.075 0.099 0.311	0.308 0.150 0.091 0.110 0.344	0.314 0.145 0.140 0.160 0.215	StraightCu	0.489 0.239 0.321 0.327 0.344
## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension	0.116 0.057 -0.075 0.099 0.311 0.203	0.308 0.150 0.091 0.110 0.344 0.353	0.314 0.145 0.140 0.160 0.215 0.095	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309
## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion	0.116 0.057 -0.075 0.099 0.311 0.203 0.246	0.308 0.150 0.091 0.110 0.344 0.353 0.232	0.314 0.145 0.140 0.160 0.215 0.095 0.181	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280
## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408
## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000
## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.280 0.408 0.535 0.512 1.000 0.195
## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000 0.195 0.139
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.173	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281
######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314 0.362	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.179 0.278	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194
######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289 0.317	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314 0.362 0.350	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.173 0.119 0.278 0.349	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194 0.323
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289 0.317 0.190	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314 0.362 0.350 0.290	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.173 0.119 0.278 0.349 0.110	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194 0.323 0.263
#######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289 0.317 0.190 0.173	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314 0.362 0.350 0.290 0.202	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.173 0.119 0.278 0.349 0.110 0.246	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.395 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194 0.323 0.263 0.241
##########################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289 0.317 0.190 0.173 0.405	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.240 0.314 0.362 0.350 0.290 0.202 0.399	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.119 0.278 0.349 0.110	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194 0.323 0.263 0.241 0.425
###########################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles ProblemReasoning	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289 0.317 0.190 0.173 0.405 0.160	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314 0.362 0.350 0.290 0.292 0.399 0.304	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.173 0.119 0.278 0.349 0.110 0.246 0.355 0.193	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194 0.323 0.263 0.241 0.425 0.279
#######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles	0.116 0.057 -0.075 0.099 0.311 0.203 0.246 0.285 0.170 1.000 0.484 0.585 0.408 0.172 0.154 0.124 0.289 0.317 0.190 0.173 0.405	0.308 0.150 0.091 0.110 0.344 0.353 0.232 0.300 0.280 0.484 1.000 0.428 0.535 0.350 0.240 0.314 0.362 0.350 0.290 0.202 0.304 0.251	0.314 0.145 0.140 0.160 0.215 0.095 0.181 0.271 0.113 0.585 0.428 1.000 0.512 0.131 0.173 0.119 0.278 0.349 0.110	StraightCu	0.489 0.239 0.321 0.327 0.344 0.309 0.345 0.280 0.408 0.535 0.512 1.000 0.195 0.139 0.281 0.194 0.323 0.263 0.241 0.425

##		WordRecognition	NumberRecognition	FigureRecognition
	VisualPerception	0.125	0.238	0.414
	Cubes	0.103	0.131	0.272
##	PaperFormBoard	0.177	0.065	0.263
	Flags	0.066	0.127	0.322
##	GeneralInformation	0.280	0.229	0.187
##	PargraphComprehension	0.292	0.251	0.291
	SentenceCompletion	0.236	0.172	0.180
##	WordClassification	0.252	0.175	0.296
##	WordMeaning	0.260	0.248	0.242
##	Addition	0.172	0.154	0.124
##	Code	0.350	0.240	0.314
##	CountingDots	0.131	0.173	0.119
##	StraightCurvedCapitals	0.195	0.139	0.281
##	WordRecognition	1.000	0.370	0.412
	NumberRecognition	0.370	1.000	0.325
##	FigureRecognition	0.412	0.325	1.000
	ObjectNumber	0.341	0.345	0.324
	NumberFigure	0.201	0.334	0.344
	FigureWord	0.206	0.192	0.258
	Deduction	0.302	0.272	0.388
	NumericalPuzzles	0.183	0.232	0.348
	ProblemReasoning	0.243	0.246	0.283
	SeriesCompletion	0.242	0.256	0.360
	ArithmeticProblems	0.304	0.165	0.262
##		ObjectNumber Num	nberFigure FigureWo	ord Deduction
		_		
	VisualPerception	0.176	0.368 0.2	270 0.365
##	Cubes	0.176 0.005	0.368 0.2 0.255 0.1	270 0.365 112 0.292
## ##	Cubes PaperFormBoard	0.176 0.005 0.177	0.368 0.255 0.211 0.336	0.365 112 0.292 312 0.297
## ## ##	Cubes PaperFormBoard Flags	0.176 0.005 0.177 0.187	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1	0.365 112 0.292 312 0.297 137 0.339
## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation	0.176 0.005 0.177 0.187 0.208	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1	0.365 112 0.292 312 0.297 137 0.339 190 0.398
## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension	0.176 0.005 0.177 0.187 0.208 0.273	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2	0.365 0.292 312 0.297 137 0.339 190 0.398 251 0.435
## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion	0.176 0.005 0.177 0.187 0.208 0.273 0.228	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2	0.365 0.292 0.297 0.37 0.339 0.398 0.435 0.451
## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2	0.365 0.292 0.297 0.37 0.339 0.398 0.435 0.451 0.427
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2	0.365 0.292 312 0.297 0.339 0.398 0.435 0.435 0.451 0.427 0.446
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.1	0.365 0.292 0.297 0.37 0.339 0.398 0.435 0.435 0.451 0.427 0.446 0.173
## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.3 0.350 0.2	0.365 0.292 0.297 0.37 0.339 0.398 0.435 0.435 0.451 0.427 0.427 0.446 0.90 0.173 0.202
## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.1 0.350 0.2 0.349 0.1	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.1 0.350 0.2 0.349 0.3 0.323 0.2	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241
## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.3 0.350 0.2 0.349 0.3 0.323 0.2 0.201 0.3	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302
## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.3 0.349 0.3 0.323 0.2 0.334 0.3 0.334 0.3	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272
## ## ## ## ## ## ## ## ## ## ## ## ##	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.324	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.250 0.2 0.288 0.2 0.317 0.1 0.350 0.2 0.349 0.1 0.323 0.2 0.334 0.1 0.334 0.3 0.344 0.3	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388
######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.324 1.000	0.368	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262
######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.324 1.000 0.448	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.1 0.350 0.2 0.349 0.1 0.323 0.2 0.334 0.1 0.334 0.1 0.344 0.3 0.448 0.3 1.000 0.3	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262 358 0.301
######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.324 1.000 0.448	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.250 0.2 0.208 0.2 0.317 0.3 0.349 0.3 0.323 0.2 0.334 0.1 0.344 0.2 0.348 0.3 0.349 0.3 0.358 1.6	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262 358 0.301 300 0.167
#######################################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.344 1.000 0.448 0.324 0.262	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.1 0.349 0.1 0.323 0.2 0.334 0.1 0.344 0.3 0.448 0.3 1.000 0.3 0.358 1.6 0.301 0.1	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262 358 0.301 300 0.167 1.000
########################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.324 1.000 0.448 0.324 0.262	0.368 0.255 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.208 0.2 0.317 0.1 0.350 0.2 0.349 0.1 0.323 0.2 0.344 0.3 0.344 0.3 0.348 0.3 0.358 1.0 0.357 0.3	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.427 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262 358 0.301 300 0.167 167 1.000 331 0.413
#########################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles ProblemReasoning	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.344 1.000 0.448 0.324 0.262	0.368 0.2 0.255 0.1 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.250 0.2 0.208 0.2 0.317 0.1 0.349 0.1 0.323 0.2 0.334 0.1 0.344 0.3 0.448 0.3 1.000 0.3 0.358 1.6 0.301 0.1	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262 358 0.301 300 0.167 1.000 331 0.413 342 0.463
###########################	Cubes PaperFormBoard Flags GeneralInformation PargraphComprehension SentenceCompletion WordClassification WordMeaning Addition Code CountingDots StraightCurvedCapitals WordRecognition NumberRecognition FigureRecognition ObjectNumber NumberFigure FigureWord Deduction NumericalPuzzles	0.176 0.005 0.177 0.187 0.208 0.273 0.228 0.255 0.274 0.289 0.362 0.278 0.194 0.341 0.345 0.324 1.000 0.448 0.324 0.262 0.173 0.273	0.368 0.255 0.211 0.3 0.251 0.1 0.263 0.1 0.167 0.2 0.159 0.2 0.208 0.2 0.317 0.3 0.349 0.3 0.323 0.2 0.334 0.3 0.344 0.3 0.344 0.3 0.358 1.6 0.357 0.3 0.317 0.3 0.317 0.3 0.272 0.3	270 0.365 112 0.292 312 0.297 137 0.339 190 0.398 251 0.435 226 0.451 274 0.446 190 0.173 290 0.202 110 0.246 263 0.241 206 0.302 192 0.272 258 0.388 324 0.262 358 0.301 300 0.167 1.000 331 0.413 342 0.463

##		NumericalPuzzles	ProblemReasoning	SeriesCompletion
##	VisualPerception	0.369	0.413	0.474
	Cubes	0.306	0.232	0.348
##	PaperFormBoard	0.165	0.250	0.383
	Flags	0.349	0.380	0.335
	GeneralInformation	0.318	0.441	0.435
##	PargraphComprehension	0.263	0.386	0.431
	SentenceCompletion	0.314	0.396	0.405
	WordClassification	0.362	0.357	0.501
##	WordMeaning	0.266	0.483	0.504
##	Addition	0.405	0.160	0.262
##	Code	0.399	0.304	0.251
##	CountingDots	0.355	0.193	0.350
##	StraightCurvedCapitals	0.425	0.279	0.382
##	WordRecognition	0.183	0.243	0.242
##	NumberRecognition	0.232	0.246	0.256
##	FigureRecognition	0.348	0.283	0.360
##	ObjectNumber	0.173	0.273	0.287
##	NumberFigure	0.357	0.317	0.272
##	FigureWord	0.331	0.342	0.303
##	Deduction	0.413	0.463	0.509
##	NumericalPuzzles	1.000	0.374	0.451
##	ProblemReasoning	0.374	1.000	0.503
##	SeriesCompletion	0.451	0.503	1.000
##	ArithmeticProblems	0.448	0.375	0.434
##		ArithmeticProblem		
	VisualPerception	0.28		
##	Cubes	0.21		
	PaperFormBoard	0.20		
	Flags	0.24		
	GeneralInformation	0.42		
	PargraphComprehension	0.43		
	SentenceCompletion	0.43		
	WordClassification	0.38		
	WordMeaning	0.42		
	Addition	0.53		
	Code	0.41		
	CountingDots	0.41		
	StraightCurvedCapitals	0.35		
	WordRecognition	0.30		
	NumberRecognition	0.16		
	FigureRecognition	0.26		
	ObjectNumber	0.32		
	NumberFigure	0.40		
	FigureWord	0.37		
	Deduction	0.36		
	NumericalPuzzles	0.44		
	ProblemReasoning	0.37		
	SeriesCompletion	0.43		
##	ArithmeticProblems	1.00	טע	

library(corrgram) # Could also try plotcorr() in ellipse package? corrgram(correlations)

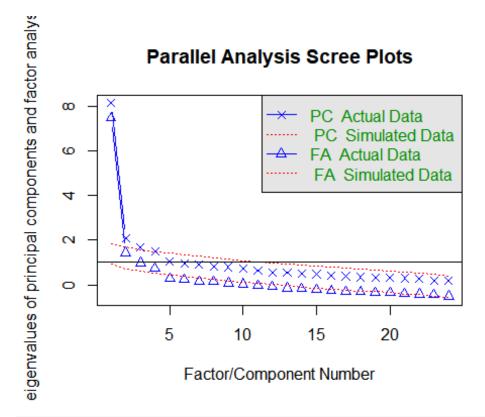


```
fa.parallel(correlations, n.obs=145, fa="both", n.iter=100)

## Warning in fac(r = r, nfactors = nfactors, n.obs = n.obs, rotate =
## rotate, : A loading greater than abs(1) was detected. Examine the loadings
## carefully.

## The estimated weights for the factor scores are probably incorrect. Try a
different factor extraction method.

## Warning in fac(r = r, nfactors = nfactors, n.obs = n.obs, rotate =
## rotate, : An ultra-Heywood case was detected. Examine the results
carefully
```



```
## Parallel analysis suggests that the number of factors = 4
                                                                and the number
of components = 4
# FA with 4 factors using maximum likelihood
fa(correlations, nfactors=4, rotate="none", fm="ml")
## Factor Analysis using method = ml
## Call: fa(r = correlations, nfactors = 4, rotate = "none", fm = "ml")
## Standardized loadings (pattern matrix) based upon correlation matrix
##
                                  ML2
                                        ML3
                                              ML4
                                                    h2
                           ML1
                                                         u2 com
## VisualPerception
                          0.55
                                0.04
                                      0.45 -0.22 0.56 0.44 2.3
## Cubes
                          0.34 - 0.01
                                      0.29 -0.13 0.22 0.78 2.3
## PaperFormBoard
                          0.38 - 0.11
                                      0.42 -0.16 0.36 0.64 2.4
                          0.46 -0.07
## Flags
                                      0.30 -0.20 0.35 0.65 2.2
## GeneralInformation
                          0.74 -0.23 -0.22 -0.04 0.65 0.35 1.4
## PargraphComprehension
                          0.74 -0.35 -0.15
                                             0.06 0.69 0.31 1.5
## SentenceCompletion
                          0.74 -0.32 -0.24 -0.10 0.72 0.28 1.7
## WordClassification
                          0.70 -0.12 -0.03 -0.12 0.51 0.49 1.1
## WordMeaning
                          0.75 -0.39 -0.16
                                             0.06 0.74 0.26 1.6
## Addition
                          0.49
                                0.62 -0.38 -0.01 0.76 0.24 2.6
## Code
                          0.54
                                0.37 -0.04
                                             0.14 0.45 0.55 1.9
## CountingDots
                          0.45
                                0.57 -0.04 -0.19 0.56 0.44 2.2
## StraightCurvedCapitals 0.58
                                0.31
                                      0.12 -0.26 0.51 0.49 2.1
## WordRecognition
                                      0.08
                                             0.43 0.35 0.65 2.1
                          0.40
                                0.04
## NumberRecognition
                          0.36
                                0.07
                                      0.16
                                             0.37 0.30 0.70 2.4
## FigureRecognition
                          0.45
                                0.07
                                      0.42
                                             0.26 0.45 0.55 2.6
## ObjectNumber
                          0.44
                                0.19
                                      0.08
                                             0.41 0.40 0.60 2.4
```

```
0.46 0.31 0.24 0.18 0.41 0.59 2.7
## NumberFigure
                         0.42 0.09 0.17
## FigureWord
                                           0.16 0.24 0.76 1.8
## Deduction
                         0.60 -0.09 0.19 0.04 0.41 0.59 1.3
                         0.56 0.27 0.15 -0.09 0.42 0.58 1.7
## NumericalPuzzles
## ProblemReasoning
                         0.59 -0.08 0.19 0.04 0.40 0.60 1.3
## SeriesCompletion
                         0.67 0.00 0.22 -0.09 0.50 0.50 1.2
## ArithmeticProblems
                         0.65 0.24 -0.11 0.06 0.50 0.50 1.3
##
##
                         ML1 ML2 ML3 ML4
## SS loadings
                        7.52 1.70 1.33 0.92
## Proportion Var
                        0.31 0.07 0.06 0.04
## Cumulative Var
                        0.31 0.38 0.44 0.48
## Proportion Explained 0.66 0.15 0.12 0.08
## Cumulative Proportion 0.66 0.80 0.92 1.00
##
## Mean item complexity = 1.9
## Test of the hypothesis that 4 factors are sufficient.
##
## The degrees of freedom for the null model are 276 and the objective
function was 11.44
## The degrees of freedom for the model are 186 and the objective function
was 1.71
##
## The root mean square of the residuals (RMSR) is 0.04
## The df corrected root mean square of the residuals is 0.05
## Fit based upon off diagonal values = 0.98
## Measures of factor score adequacy
                                                  ML1 ML2 ML3
                                                                 ML4
## Correlation of scores with factors
                                                 0.97 0.91 0.86 0.78
## Multiple R square of scores with factors
                                                 0.95 0.83 0.75 0.61
## Minimum correlation of possible factor scores 0.89 0.66 0.49 0.23
# with varimax rotation
fa(correlations, nfactors=4, rotate="varimax", fm="ml")
## Factor Analysis using method = ml
## Call: fa(r = correlations, nfactors = 4, rotate = "varimax", fm = "ml")
## Standardized loadings (pattern matrix) based upon correlation matrix
##
                          ML1
                                ML3
                                      ML2 ML4
                                                 h2
                                                      u2 com
## VisualPerception
                         0.16
                               0.69 0.19 0.16 0.56 0.44 1.4
## Cubes
                         0.12 0.44 0.08 0.10 0.22 0.78 1.3
## PaperFormBoard
                         0.14
                               0.57 -0.02 0.11 0.36 0.64 1.2
                         0.23
                               0.53 0.10 0.08 0.35 0.65 1.5
## Flags
## GeneralInformation
                         0.74
                               0.19 0.21 0.15 0.65 0.35 1.4
                         0.77 0.20 0.07 0.23 0.69 0.31 1.4
## PargraphComprehension
## SentenceCompletion
                         0.81 0.20 0.15 0.07 0.72 0.28 1.2
## WordClassification
                         0.57 0.34 0.24 0.13 0.51 0.49 2.2
                         0.81 0.20 0.04 0.23 0.74 0.26 1.3
## WordMeaning
                         0.17 -0.12 0.83 0.17 0.76 0.24 1.2
## Addition
```

```
## Code
                         0.18 0.12 0.51 0.37 0.45 0.55 2.2
## CountingDots
                         0.02 0.21 0.72 0.09 0.56 0.44 1.2
## StraightCurvedCapitals 0.19
                               0.44 0.53 0.08 0.51 0.49 2.3
## WordRecognition
                         0.20 0.05 0.08 0.55 0.35 0.65 1.3
## NumberRecognition
                         0.12 0.12 0.07 0.52 0.30 0.70 1.3
## FigureRecognition
                         0.07 0.41 0.06 0.53 0.45 0.55 2.0
## ObjectNumber
                         0.14 0.06 0.22 0.57 0.40 0.60 1.4
                         0.03 0.29 0.34 0.46 0.41 0.59 2.6
## NumberFigure
                         0.15 0.24 0.16 0.37 0.24 0.76 2.6
## FigureWord
## Deduction
                         0.38 0.40 0.12 0.30 0.41 0.59 3.0
## NumericalPuzzles
                         0.17 0.38 0.44 0.22 0.42 0.58 2.8
                         0.37 0.40 0.12 0.30 0.40 0.60 3.1
## ProblemReasoning
## SeriesCompletion
                         0.37 0.50 0.24 0.24 0.50 0.50 2.9
## ArithmeticProblems
                         0.37 0.16 0.50 0.30 0.50 0.50 2.8
##
##
                         ML1 ML3 ML2 ML4
## SS loadings
                        3.65 2.87 2.66 2.29
## Proportion Var
                        0.15 0.12 0.11 0.10
## Cumulative Var
                        0.15 0.27 0.38 0.48
## Proportion Explained 0.32 0.25 0.23 0.20
## Cumulative Proportion 0.32 0.57 0.80 1.00
##
## Mean item complexity = 1.9
## Test of the hypothesis that 4 factors are sufficient.
##
## The degrees of freedom for the null model are 276 and the objective
function was 11.44
## The degrees of freedom for the model are 186 and the objective function
was 1.71
##
## The root mean square of the residuals (RMSR) is 0.04
## The df corrected root mean square of the residuals is 0.05
##
## Fit based upon off diagonal values = 0.98
## Measures of factor score adequacy
##
                                                  ML1 ML3 ML2 ML4
## Correlation of scores with factors
                                                 0.93 0.87 0.91 0.82
## Multiple R square of scores with factors
                                                 0.87 0.76 0.83 0.68
## Minimum correlation of possible factor scores 0.73 0.52 0.66 0.36
# with promax roation
fa(correlations, nfactors=4, rotate="promax", fm="ml")
## Factor Analysis using method = ml
## Call: fa(r = correlations, nfactors = 4, rotate = "promax", fm = "ml")
## Standardized loadings (pattern matrix) based upon correlation matrix
                                 ML3
                                       ML2
                           ML1
                                             ML4
                                                   h2
                                                        u2 com
## VisualPerception
                         -0.07
                                0.78 0.05 -0.04 0.56 0.44 1.0
## Cubes
                         -0.02
                                0.50 -0.01 -0.03 0.22 0.78 1.0
## PaperFormBoard
                         -0.02 0.69 -0.17 -0.02 0.36 0.64 1.1
```

```
## Flags
                          0.10 0.59 -0.02 -0.10 0.35 0.65 1.1
## GeneralInformation
                           0.80 -0.03 0.09 -0.05 0.65 0.35 1.0
## PargraphComprehension
                          0.84 -0.01 -0.12 0.09 0.69 0.31 1.1
                          0.91 -0.01 0.03 -0.14 0.72 0.28 1.1
## SentenceCompletion
## WordClassification
                          0.54 0.21 0.13 -0.08 0.51 0.49 1.5
## WordMeaning
                          0.89 -0.02 -0.15
                                            0.08 0.74 0.26 1.1
                                             0.00 0.76 0.24 1.3
## Addition
                          0.08 - 0.41
                                       0.99
## Code
                          0.03 -0.09
                                      0.50
                                            0.29 0.45 0.55 1.7
## CountingDots
                          -0.17 0.10 0.83 -0.13 0.56 0.44 1.2
## StraightCurvedCapitals 0.01
                                0.40
                                      0.53 -0.17 0.51 0.49 2.1
## WordRecognition
                          0.10 -0.15 -0.07
                                             0.65 0.35 0.65 1.2
## NumberRecognition
                          0.00 -0.03 -0.07
                                            0.61 0.30 0.70 1.0
                         -0.16 0.37 -0.13
                                            0.55 0.45 0.55 2.1
## FigureRecognition
## ObjectNumber
                          0.00 -0.15
                                       0.10
                                            0.65 0.40 0.60 1.2
                         -0.20 0.19
                                      0.25
                                             0.43 0.41 0.59 2.6
## NumberFigure
## FigureWord
                          0.01 0.15
                                      0.05
                                             0.35 0.24 0.76 1.4
## Deduction
                          0.27 0.33 -0.05
                                             0.19 0.41 0.59 2.6
## NumericalPuzzles
                         -0.01
                                0.31
                                       0.40
                                             0.05 0.42 0.58 1.9
## ProblemReasoning
                          0.26 0.32 -0.04
                                             0.19 0.40 0.60 2.6
                                      0.10
## SeriesCompletion
                          0.22 0.45
                                            0.05 0.50 0.50 1.6
## ArithmeticProblems
                          0.27 -0.07 0.46
                                            0.16 0.50 0.50 1.9
##
##
                         ML1
                              ML3 ML2 ML4
## SS loadings
                         3.72 2.88 2.72 2.15
## Proportion Var
                         0.16 0.12 0.11 0.09
## Cumulative Var
                         0.16 0.27 0.39 0.48
## Proportion Explained 0.32 0.25 0.24 0.19
## Cumulative Proportion 0.32 0.58 0.81 1.00
##
##
   With factor correlations of
##
        ML1 ML3 ML2 ML4
## ML1 1.00 0.59 0.48 0.54
## ML3 0.59 1.00 0.53 0.59
## ML2 0.48 0.53 1.00 0.56
## ML4 0.54 0.59 0.56 1.00
##
## Mean item complexity = 1.5
## Test of the hypothesis that 4 factors are sufficient.
## The degrees of freedom for the null model are 276 and the objective
function was 11.44
## The degrees of freedom for the model are 186 and the objective function
was 1.71
##
## The root mean square of the residuals (RMSR) is
## The df corrected root mean square of the residuals is 0.05
## Fit based upon off diagonal values = 0.98
## Measures of factor score adequacy
##
                                                   ML1 ML3 ML2 ML4
```