

Homework 4

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```
music<-read.csv("music.csv")

fit1<-factanal(music[, -28], factors=2, score="reg", rotation="varimax")
fit1 #31, 47 maybe, 49 maybe, 53, 54

##
## Call:
## factanal(x = music[, -28], factors = 2, scores = "reg", rotation =
"varimax")
##
## Uniquenesses:
##   V28   V29   V30   V31   V32   V33   V34   V35   V36   V37   V38   V39
## 0.303 0.369 0.392 0.617 0.289 0.365 0.400 0.399 0.266 0.302 0.262 0.292
##   V40   V41   V42   V43   V44   V45   V46   V47   V48   V49   V50   V51
## 0.317 0.259 0.389 0.353 0.441 0.538 0.355 0.496 0.466 0.629 0.491 0.427
##   V52   V53   V54
## 0.418 0.437 0.562
##
## Loadings:
##      Factor1 Factor2
## V28 0.468    0.691
## V29 0.420    0.674
## V30 0.372    0.685
## V31 0.389    0.481
## V32 0.301    0.788
## V33 0.197    0.772
## V34 0.178    0.754
## V35 0.709    0.314
## V36 0.770    0.376
## V37 0.741    0.386
## V38 0.791    0.335
## V39 0.768    0.345
## V40 0.797    0.218
## V41 0.803    0.310
## V42 0.655    0.427
## V43 0.178    0.785
## V44 0.730    0.161
## V45 0.643    0.221
## V46 0.187    0.781
## V47 0.401    0.586
## V48 0.643    0.347
## V49 0.514    0.326
```

```

## V50 0.337 0.629
## V51 0.738 0.170
## V52 0.415 0.641
## V53 0.570 0.488
## V54 0.479 0.456
##
##               Factor1 Factor2
## SS loadings      8.65  7.517
## Proportion Var   0.32  0.278
## Cumulative Var   0.32  0.599
##
## Test of the hypothesis that 2 factors are sufficient.
## The chi square statistic is 2837.96 on 298 degrees of freedom.
## The p-value is 0

#musicpca<-prcomp(music[, -28], scale=T)
#musicpca$rotation #31, 49

alpha(music[, -28], check.keys=TRUE) #31, 34, 43, 45, 49

##
## Reliability analysis
## Call: alpha(x = music[, -28], check.keys = TRUE)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd
##      0.97      0.97    0.97      0.51  28 0.0014  3.2 0.89
##
##   lower alpha upper      95% confidence boundaries
## 0.96 0.97 0.97
##
## Reliability if an item is dropped:
##   raw_alpha std.alpha G6(smc) average_r S/N alpha se
## V28      0.96      0.96    0.97      0.51  27 0.0015
## V29      0.96      0.96    0.97      0.51  27 0.0015
## V30      0.96      0.96    0.97      0.51  27 0.0015
## V31      0.96      0.97    0.97      0.52  28 0.0014
## V32      0.96      0.96    0.97      0.51  27 0.0015
## V33      0.96      0.96    0.97      0.51  28 0.0014
## V34      0.96      0.97    0.97      0.52  28 0.0014
## V35      0.96      0.96    0.97      0.51  27 0.0015
## V36      0.96      0.96    0.97      0.51  27 0.0015
## V37      0.96      0.96    0.97      0.51  27 0.0015
## V38      0.96      0.96    0.97      0.51  27 0.0015
## V39      0.96      0.96    0.97      0.51  27 0.0015
## V40      0.96      0.96    0.97      0.51  27 0.0015
## V41      0.96      0.96    0.97      0.51  27 0.0015
## V42      0.96      0.96    0.97      0.51  27 0.0015
## V43      0.96      0.97    0.97      0.51  28 0.0014
## V44      0.96      0.96    0.97      0.51  28 0.0014
## V45      0.96      0.97    0.97      0.52  28 0.0014

```

```

## V46      0.96      0.96      0.97      0.51  28  0.0014
## V47      0.96      0.96      0.97      0.51  27  0.0015
## V48      0.96      0.96      0.97      0.51  27  0.0015
## V49      0.96      0.97      0.97      0.52  28  0.0014
## V50      0.96      0.96      0.97      0.51  27  0.0015
## V51      0.96      0.96      0.97      0.51  28  0.0014
## V52      0.96      0.96      0.97      0.51  27  0.0015
## V53      0.96      0.96      0.97      0.51  27  0.0015
## V54      0.96      0.96      0.97      0.51  27  0.0015

```

```
##
```

```
## Item statistics
```

```

##          n raw.r std.r r.cor r.drop mean  sd
## V28 1278  0.82  0.82  0.81  0.80  3.1 1.3
## V29 1278  0.78  0.78  0.77  0.76  3.0 1.2
## V30 1278  0.76  0.75  0.74  0.73  2.8 1.3
## V31 1278  0.63  0.63  0.61  0.60  3.0 1.2
## V32 1278  0.77  0.76  0.75  0.74  2.7 1.3
## V33 1278  0.69  0.68  0.66  0.66  2.4 1.3
## V34 1278  0.66  0.65  0.64  0.63  2.4 1.4
## V35 1278  0.73  0.74  0.73  0.71  3.7 1.2
## V36 1278  0.81  0.82  0.81  0.79  3.6 1.1
## V37 1278  0.80  0.81  0.80  0.78  3.5 1.2
## V38 1278  0.79  0.80  0.80  0.77  3.7 1.2
## V39 1278  0.78  0.79  0.79  0.76  3.6 1.2
## V40 1278  0.74  0.75  0.74  0.71  3.8 1.2
## V41 1278  0.79  0.80  0.79  0.77  3.7 1.1
## V42 1278  0.77  0.77  0.76  0.74  3.2 1.2
## V43 1278  0.68  0.67  0.66  0.65  2.3 1.3
## V44 1278  0.66  0.67  0.66  0.64  4.1 1.1
## V45 1278  0.65  0.65  0.64  0.62  3.8 1.2
## V46 1278  0.69  0.68  0.67  0.66  2.5 1.4
## V47 1278  0.72  0.71  0.70  0.69  3.2 1.3
## V48 1278  0.72  0.72  0.71  0.69  3.6 1.1
## V49 1278  0.64  0.64  0.62  0.60  3.3 1.3
## V50 1278  0.70  0.70  0.68  0.68  2.9 1.3
## V51 1278  0.67  0.68  0.66  0.64  4.0 1.1
## V52 1278  0.76  0.75  0.74  0.73  3.0 1.2
## V53 1278  0.76  0.76  0.75  0.74  3.2 1.3
## V54 1278  0.69  0.69  0.67  0.66  3.2 1.3

```

```
##
```

```
## Non missing response frequency for each item
```

```

##          0      1      2      3      4      5 miss
## V28 0.02 0.12 0.12 0.33 0.27 0.13      0
## V29 0.02 0.13 0.13 0.39 0.22 0.11      0
## V30 0.03 0.19 0.17 0.28 0.22 0.11      0
## V31 0.02 0.11 0.15 0.35 0.27 0.10      0
## V32 0.02 0.20 0.19 0.30 0.19 0.09      0
## V33 0.03 0.29 0.21 0.25 0.14 0.08      0
## V34 0.03 0.33 0.18 0.19 0.18 0.09      0
## V35 0.02 0.06 0.05 0.22 0.41 0.24      0

```

```
## V36 0.02 0.05 0.05 0.29 0.38 0.20 0
## V37 0.03 0.05 0.08 0.27 0.36 0.21 0
## V38 0.02 0.05 0.07 0.20 0.44 0.23 0
## V39 0.02 0.04 0.06 0.24 0.42 0.22 0
## V40 0.02 0.05 0.05 0.17 0.41 0.30 0
## V41 0.02 0.04 0.05 0.24 0.44 0.21 0
## V42 0.03 0.06 0.11 0.40 0.27 0.14 0
## V43 0.03 0.33 0.23 0.23 0.11 0.06 0
## V44 0.02 0.02 0.03 0.13 0.37 0.43 0
## V45 0.03 0.04 0.06 0.19 0.37 0.32 0
## V46 0.02 0.30 0.18 0.26 0.14 0.10 0
## V47 0.02 0.13 0.10 0.27 0.30 0.18 0
## V48 0.02 0.05 0.06 0.28 0.40 0.20 0
## V49 0.02 0.09 0.12 0.23 0.34 0.19 0
## V50 0.02 0.15 0.14 0.34 0.25 0.10 0
## V51 0.03 0.02 0.02 0.14 0.43 0.36 0
## V52 0.02 0.12 0.14 0.41 0.21 0.10 0
## V53 0.02 0.11 0.15 0.27 0.28 0.16 0
## V54 0.02 0.09 0.14 0.27 0.32 0.15 0
```

##all three methods suggest removing 31 and 49, also removing 54 because of promiscuity

```
fit2<-factanal(music[, -
c(4,22,27,28)],factors=2,score="reg",rotation="varimax")
fit2loadings<-fit2$loadings
fit2loadings[fit2loadings<.3]<-0
fit2loadings
```

```
##
## Loadings:
##      Factor1 Factor2
## V28 0.473    0.688
## V29 0.423    0.671
## V30 0.373    0.681
## V32 0.308    0.783
## V33      0.771
## V34      0.756
## V35 0.715    0.309
## V36 0.776    0.371
## V37 0.745    0.382
## V38 0.800    0.328
## V39 0.776    0.340
## V40 0.789
## V41 0.808    0.305
## V42 0.662    0.422
## V43      0.783
## V44 0.722
## V45 0.634
## V46      0.782
```

```
## V47 0.404    0.586
## V48 0.646    0.343
## V50 0.336    0.628
## V51 0.734
## V52 0.419    0.636
## V53 0.570    0.483
##
##                Factor1 Factor2
## SS loadings      7.917   6.755
## Proportion Var   0.330   0.281
## Cumulative Var   0.330   0.611

#Factor 1 is social aspects of music. Includes questions 28, 29, 30, 32, 33, 34, 43, 46, 47, 50, 52
#Factor 2 is personal aspects. Includes questions 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 48, 51

music1<-music[,c(1,2,3,5,6,7,16,19,20,23,25)]
music2<-music[,c(8,9,10,11,12,13,14,15,17,18,21,24)]

alpha(music1)

##
## Reliability analysis
## Call: alpha(x = music1)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean sd
##      0.94      0.94    0.94      0.6  16 0.0024  2.8  1
##
##   lower alpha upper      95% confidence boundaries
## 0.94 0.94 0.95
##
## Reliability if an item is dropped:
##   raw_alpha std.alpha G6(smc) average_r S/N alpha se
## V28      0.93      0.94    0.94      0.59  14 0.0027
## V29      0.94      0.94    0.94      0.60  15 0.0027
## V30      0.94      0.94    0.94      0.60  15 0.0026
## V32      0.93      0.93    0.94      0.59  14 0.0027
## V33      0.94      0.94    0.94      0.60  15 0.0026
## V34      0.94      0.94    0.94      0.60  15 0.0026
## V43      0.94      0.94    0.94      0.60  15 0.0026
## V46      0.94      0.94    0.94      0.60  15 0.0027
## V47      0.94      0.94    0.94      0.61  16 0.0025
## V50      0.94      0.94    0.94      0.61  15 0.0026
## V52      0.94      0.94    0.94      0.60  15 0.0026
##
## Item statistics
##      n raw.r std.r r.cor r.drop mean  sd
## V28 1278 0.84 0.84 0.83 0.80 3.1 1.3
## V29 1278 0.81 0.81 0.80 0.77 3.0 1.2
```

```
## V30 1278 0.80 0.80 0.77 0.75 2.8 1.3
## V32 1278 0.85 0.85 0.83 0.81 2.7 1.3
## V33 1278 0.80 0.80 0.78 0.75 2.4 1.3
## V34 1278 0.79 0.78 0.76 0.73 2.4 1.4
## V43 1278 0.80 0.80 0.78 0.75 2.3 1.3
## V46 1278 0.82 0.81 0.79 0.77 2.5 1.4
## V47 1278 0.75 0.74 0.71 0.69 3.2 1.3
## V50 1278 0.75 0.76 0.72 0.70 2.9 1.3
## V52 1278 0.78 0.78 0.75 0.73 3.0 1.2
##
```

```
## Non missing response frequency for each item
```

```
##      0      1      2      3      4      5 miss
## V28 0.02 0.12 0.12 0.33 0.27 0.13 0
## V29 0.02 0.13 0.13 0.39 0.22 0.11 0
## V30 0.03 0.19 0.17 0.28 0.22 0.11 0
## V32 0.02 0.20 0.19 0.30 0.19 0.09 0
## V33 0.03 0.29 0.21 0.25 0.14 0.08 0
## V34 0.03 0.33 0.18 0.19 0.18 0.09 0
## V43 0.03 0.33 0.23 0.23 0.11 0.06 0
## V46 0.02 0.30 0.18 0.26 0.14 0.10 0
## V47 0.02 0.13 0.10 0.27 0.30 0.18 0
## V50 0.02 0.15 0.14 0.34 0.25 0.10 0
## V52 0.02 0.12 0.14 0.41 0.21 0.10 0
```

```
alpha(music2)
```

```
##
```

```
## Reliability analysis
```

```
## Call: alpha(x = music2)
```

```
##
```

```
##      raw_alpha std.alpha G6(smc) average_r S/N ase mean sd
##      0.95      0.95      0.96      0.63 20 0.002 3.7 0.94
```

```
##
```

```
## lower alpha upper      95% confidence boundaries
```

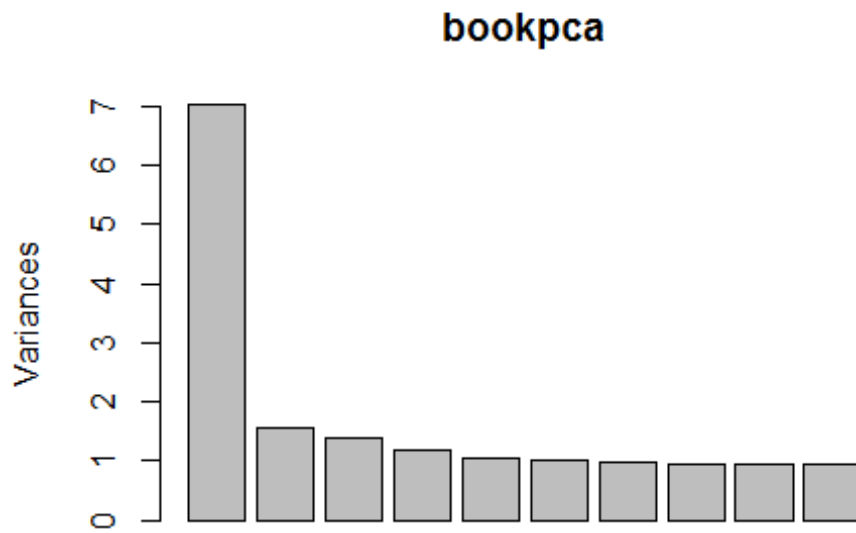
```
## 0.95 0.95 0.96
```

```
##
```

```
## Reliability if an item is dropped:
```

```
##      raw_alpha std.alpha G6(smc) average_r S/N alpha se
## V35      0.95      0.95      0.95      0.63 19 0.0021
## V36      0.95      0.95      0.95      0.62 18 0.0022
## V37      0.95      0.95      0.95      0.62 18 0.0022
## V38      0.95      0.95      0.95      0.62 18 0.0022
## V39      0.95      0.95      0.95      0.62 18 0.0022
## V40      0.95      0.95      0.95      0.62 18 0.0022
## V41      0.95      0.95      0.95      0.62 18 0.0022
## V42      0.95      0.95      0.95      0.63 19 0.0021
## V44      0.95      0.95      0.95      0.63 19 0.0021
## V45      0.95      0.95      0.95      0.64 20 0.0020
## V48      0.95      0.95      0.95      0.64 19 0.0021
## V51      0.95      0.95      0.95      0.63 19 0.0021
```

```
##
## Item statistics
##      n raw.r std.r r.cor r.drop mean  sd
## V35 1278 0.81 0.81 0.79 0.76 3.7 1.2
## V36 1278 0.87 0.87 0.86 0.84 3.6 1.1
## V37 1278 0.84 0.84 0.82 0.80 3.5 1.2
## V38 1278 0.87 0.87 0.86 0.84 3.7 1.2
## V39 1278 0.85 0.85 0.84 0.82 3.6 1.2
## V40 1278 0.83 0.83 0.81 0.79 3.8 1.2
## V41 1278 0.87 0.87 0.86 0.84 3.7 1.1
## V42 1278 0.78 0.78 0.76 0.74 3.2 1.2
## V44 1278 0.77 0.77 0.75 0.72 4.1 1.1
## V45 1278 0.72 0.71 0.68 0.66 3.8 1.2
## V48 1278 0.76 0.76 0.73 0.71 3.6 1.1
## V51 1278 0.77 0.77 0.75 0.73 4.0 1.1
##
## Non missing response frequency for each item
##      0    1    2    3    4    5 miss
## V35 0.02 0.06 0.05 0.22 0.41 0.24    0
## V36 0.02 0.05 0.05 0.29 0.38 0.20    0
## V37 0.03 0.05 0.08 0.27 0.36 0.21    0
## V38 0.02 0.05 0.07 0.20 0.44 0.23    0
## V39 0.02 0.04 0.06 0.24 0.42 0.22    0
## V40 0.02 0.05 0.05 0.17 0.41 0.30    0
## V41 0.02 0.04 0.05 0.24 0.44 0.21    0
## V42 0.03 0.06 0.11 0.40 0.27 0.14    0
## V44 0.02 0.02 0.03 0.13 0.37 0.43    0
## V45 0.03 0.04 0.06 0.19 0.37 0.32    0
## V48 0.02 0.05 0.06 0.28 0.40 0.20    0
## V51 0.03 0.02 0.02 0.14 0.43 0.36    0
```



```
##
## Loadings:
##           Factor1 Factor2 Factor3
## fiction1      0.353   0.414   0.328
## classics3           0.429
## cartoons5      0.363
## legends6
## philosophy7    0.428   0.440
## religion8      0.398   0.518
## psychology9    0.312
## linguistics10  0.425   0.308
## art12           0.443   0.359
## music14           0.318
## facsimile17
## history19           0.713   0.322
## conthist20      0.509
## economy21      0.466
## politics22
## science23      0.471   0.318
## compsci26      0.391
## railroads27           0.347
## maps30
## travelguides31  0.380   0.541
## health35       0.606   0.336
## cooking36           0.476
## learning37      0.597
## GamesRiddles38
```



```

## sports39
## hobby40          0.349          0.578
## nature41          0.439
## encyclopaedia44 0.436
## videos50
## nonbooks99
##
##          Factor1 Factor2 Factor3
## SS loadings    2.503    2.121    1.720
## Proportion Var  0.083    0.071    0.057
## Cumulative Var  0.083    0.154    0.211
##
## Reliability analysis
## Call: alpha(x = book, check.keys = TRUE)
##
##      raw_alpha std.alpha G6(smc) average_r S/N      ase mean   sd
##      0.87      0.87      0.88      0.19 6.9 0.0016 0.23 0.23
##
## lower alpha upper      95% confidence boundaries
## 0.87 0.87 0.87
##
## Reliability if an item is dropped:
##      raw_alpha std.alpha G6(smc) average_r S/N alpha se
## fiction1      0.86      0.86      0.87      0.18 6.4 0.0018
## classics3     0.87      0.87      0.88      0.19 6.6 0.0017
## cartoons5     0.86      0.87      0.88      0.18 6.6 0.0017
## legends6      0.87      0.87      0.88      0.19 6.7 0.0017
## philosophy7   0.87      0.87      0.88      0.19 6.6 0.0017
## religion8      0.86      0.87      0.88      0.18 6.5 0.0017
## psychology9   0.87      0.87      0.88      0.19 6.9 0.0017
## linguistics10 0.87      0.87      0.88      0.19 6.6 0.0017
## art12         0.86      0.87      0.88      0.18 6.5 0.0017
## music14       0.87      0.87      0.88      0.19 6.6 0.0017
## facsimile17   0.87      0.87      0.88      0.19 7.0 0.0017
## history19     0.86      0.86      0.87      0.18 6.4 0.0018
## conthist20    0.87      0.87      0.88      0.19 6.6 0.0017
## economy21     0.87      0.87      0.88      0.19 6.7 0.0017
## politics22    0.87      0.87      0.88      0.19 6.9 0.0017
## science23     0.86      0.87      0.88      0.18 6.5 0.0017
## compsci26     0.87      0.87      0.88      0.19 6.7 0.0017
## railroads27   0.87      0.87      0.88      0.19 6.8 0.0017
## maps30        0.87      0.87      0.88      0.19 6.8 0.0017
## travelguides31 0.86      0.87      0.87      0.18 6.4 0.0018
## health35      0.86      0.87      0.87      0.18 6.5 0.0017
## cooking36     0.87      0.87      0.88      0.19 6.6 0.0017
## learning37    0.86      0.87      0.88      0.18 6.6 0.0017
## GamesRiddles38 0.87      0.87      0.88      0.19 6.9 0.0017
## sports39      0.87      0.88      0.89      0.20 7.1 0.0016
## hobby40       0.86      0.86      0.87      0.18 6.4 0.0017

```

```

## nature41          0.87      0.87      0.88      0.19 6.6  0.0017
## encyclopaedia44  0.86      0.87      0.88      0.18 6.5  0.0017
## videos50         0.87      0.87      0.88      0.19 7.0  0.0016
## nonbooks99       0.87      0.87      0.88      0.19 6.9  0.0016
##
## Item statistics
##          n raw.r std.r r.cor r.drop  mean   sd
## fiction1    9856  0.64  0.64 0.636  0.599 0.2594 0.496
## classics3   9856  0.47  0.48 0.460  0.428 0.1093 0.324
## cartoons5   9856  0.53  0.53 0.510  0.482 0.1890 0.415
## legends6    9856  0.39  0.42 0.380  0.357 0.0581 0.226
## philosophy7 9856  0.48  0.50 0.473  0.436 0.1365 0.374
## religion8    9856  0.61  0.59 0.580  0.547 0.3627 0.642
## psychology9  9856  0.28  0.33 0.281  0.258 0.0280 0.148
## linguistics10 9856  0.48  0.51 0.484  0.442 0.1162 0.316
## art12       9856  0.55  0.54 0.526  0.498 0.2596 0.506
## music14     9856  0.56  0.50 0.476  0.454 0.6950 0.893
## facsimile17 9856  0.22  0.26 0.207  0.195 0.0285 0.163
## history19   9856  0.71  0.66 0.664  0.631 0.7742 0.893
## conthist20   9856  0.56  0.50 0.486  0.464 0.6239 0.888
## economy21    9856  0.42  0.45 0.416  0.382 0.1057 0.313
## politics22   9856  0.24  0.28 0.230  0.220 0.0177 0.117
## science23    9856  0.57  0.58 0.563  0.518 0.1833 0.444
## compsci26    9856  0.39  0.42 0.388  0.357 0.0786 0.270
## railroads27  9856  0.35  0.35 0.315  0.311 0.0938 0.330
## maps30       9856  0.33  0.37 0.321  0.306 0.0497 0.200
## travelguides31 9856  0.65  0.62 0.617  0.585 0.4647 0.739
## health35     9856  0.62  0.60 0.593  0.536 0.6456 0.861
## cooking36    9856  0.47  0.47 0.446  0.420 0.1729 0.436
## learning37   9856  0.52  0.53 0.512  0.462 0.3148 0.541
## GamesRiddles38 9856  0.23  0.29 0.234  0.214 0.0256 0.137
## sports39     9856  0.08  0.15 0.081  0.076 0.0014 0.031
## hobby40      9856  0.64  0.64 0.634  0.586 0.2720 0.517
## nature41     9856  0.51  0.51 0.491  0.461 0.1605 0.386
## encyclopaedia44 9856  0.56  0.57 0.556  0.517 0.2318 0.446
## videos50     9856  0.26  0.25 0.191  0.189 0.2116 0.472
## nonbooks99   9856  0.33  0.34 0.286  0.266 0.2782 0.449
##
##          PC1          PC2          PC3          PC4
## fiction1    0.25074501  0.0820764459 -0.094337131  0.12510577
## classics3   0.18686809  0.1663536589 -0.299609662  0.14742881
## cartoons5   0.20342234 -0.0543773519  0.021647080 -0.00726636
## legends6    0.15572802  0.1242233723 -0.112002666  0.18184085
## philosophy7 0.19063345 -0.0884608233 -0.426387996 -0.04004194
## religion8    0.23019170  0.0152196341 -0.295331145 -0.04611727
## psychology9 0.11542275 -0.2026697272 -0.191268453 -0.04858941
## linguistics10 0.19385842 -0.1511567006 -0.206269390 -0.09238473
## art12       0.20940782  0.2672451057 -0.051235682  0.13734414
## music14     0.19012051  0.0724391776  0.129349653 -0.06162488
## facsimile17 0.08684507  0.2096804585 -0.060248097  0.21704431

```

## history19	0.25668717	0.2862297627	-0.138666794	-0.14886849
## conthist20	0.19203524	0.2534715330	-0.021023520	-0.44709267
## economy21	0.16592962	-0.3339091661	0.113665914	-0.14248873
## politics22	0.09481150	-0.0875553778	-0.004063375	-0.29008907
## science23	0.22271818	-0.1423580536	-0.113021754	-0.07063066
## compsci26	0.15602836	-0.2651775173	0.139068689	-0.12534048
## railroads27	0.12662851	0.2906142431	0.267442915	-0.33625618
## maps30	0.13087560	0.1257851504	0.146541773	-0.01434070
## travelguides31	0.24027716	0.2141794254	0.176427926	0.05549579
## health35	0.23076209	-0.2990567598	0.149020431	0.06378902
## cooking36	0.18016734	-0.0078534461	0.288634194	0.30537521
## learning37	0.20180557	-0.3559124745	0.043952405	-0.04572015
## GamesRiddles38	0.09582888	-0.1379686459	0.092729384	0.13056936
## sports39	0.03391254	-0.0006539113	-0.010013950	0.11564319
## hobby40	0.24542305	0.0169581694	0.250679995	0.19683684
## nature41	0.19721612	0.0063652474	0.196783324	0.28222094
## encyclopaedia44	0.22160820	-0.1127376002	-0.057385337	-0.05602809
## videos50	0.07651157	0.0636673233	0.319048430	-0.32593420
## nonbooks99	0.11751507	-0.0147523142	0.074380949	0.15471712
##	PC5	PC6	PC7	PC8
## fiction1	-0.18589450	0.090993460	-0.080965420	-0.120712633
## classics3	-0.12495257	0.051683089	-0.095000332	-0.103034179
## cartoons5	-0.38927990	0.110639595	-0.003337074	-0.039077414
## legends6	-0.14002515	0.047709502	-0.009291422	-0.064633155
## philosophy7	0.03120301	-0.027104270	-0.099368198	0.017673132
## religion8	0.02648359	-0.019601484	-0.072477385	0.054745674
## psychology9	-0.08231424	-0.073120378	-0.204972429	0.333953245
## linguistics10	-0.06459610	-0.049321708	0.271064007	-0.128730121
## art12	0.10168314	-0.006322187	-0.008218071	0.143420282
## music14	-0.36963491	0.030136834	-0.148020753	0.049995060
## facsimile17	0.35216273	0.166713737	0.307181973	0.532170267
## history19	0.10646893	-0.036677605	0.026141052	0.004577140
## conthist20	0.03617816	-0.057722959	-0.043078311	-0.058214342
## economy21	0.26545622	0.056855869	-0.090240583	-0.026995488
## politics22	0.29948891	0.165441630	-0.403181572	0.222265844
## science23	0.12650650	-0.028957044	0.126234147	0.049556807
## compsci26	0.17516679	-0.052650236	0.248096718	-0.081575885
## railroads27	0.07401520	-0.064228529	0.134606661	0.010863628
## maps30	0.10237501	-0.122062095	0.320517754	-0.277128048
## travelguides31	0.07403439	-0.057677166	-0.047802777	-0.092037406
## health35	0.06415006	0.032335863	-0.147294906	-0.002047499
## cooking36	0.05287580	0.081622244	-0.203275135	-0.106687301
## learning37	-0.04785892	0.001885391	0.114617667	-0.045156040
## GamesRiddles38	-0.28736706	-0.186571556	0.360749233	0.492822505
## sports39	0.05746533	-0.887568256	-0.195563201	0.033869894
## hobby40	0.14031684	-0.011972912	-0.036885189	0.030273017
## nature41	0.08671133	-0.017273835	-0.181193764	-0.040206520
## encyclopaedia44	-0.04628526	0.006323452	0.275221685	-0.185221900
## videos50	-0.35574775	-0.001584486	-0.094553483	0.296932300
## nonbooks99	-0.05612837	0.211819877	0.009426879	0.030537422

##	PC9	PC10	PC11	PC12
## fiction1	0.079993900	0.127849514	0.068843678	-0.07944381
## classics3	0.003732325	0.014679231	0.053423884	-0.13148793
## cartoons5	0.034311975	0.238873442	0.020359901	-0.20555181
## legends6	-0.056362238	0.068597640	0.142009400	0.36692611
## philosophy7	-0.075879927	-0.169925133	-0.013379203	0.16445302
## religion8	-0.062464074	-0.047214558	-0.017394619	0.15078978
## psychology9	0.071470373	-0.520748145	-0.298754030	-0.11355571
## linguistics10	-0.015621648	0.103846153	0.095608714	-0.23132736
## art12	0.035678376	-0.039144529	0.034134559	-0.08969755
## music14	0.008212801	-0.025624174	0.073147618	-0.15145873
## facsimile17	-0.126652689	-0.012221724	0.313665713	-0.29591556
## history19	0.050828576	0.038824557	-0.019695056	0.08111015
## conthist20	0.108470008	0.129757356	-0.023894266	0.12342510
## economy21	-0.009815682	-0.003020742	0.170339386	0.05732840
## politics22	-0.067474505	0.477020514	-0.324653109	-0.25302438
## science23	0.035472420	-0.154448911	-0.006674418	0.26436257
## compsci26	-0.043257008	0.049567549	0.208959348	0.10806281
## railroads27	0.176487924	-0.045194603	0.006502862	0.23510634
## maps30	-0.286434037	-0.268631154	-0.526621785	-0.26118524
## travelguides31	0.012384034	-0.096792595	-0.092644792	-0.08715190
## health35	0.022508222	-0.074394480	0.036132257	0.06096891
## cooking36	0.146336032	-0.047189870	-0.018578482	-0.10568927
## learning37	-0.001310023	-0.018271052	0.115205109	-0.12055624
## GamesRiddles38	0.262410711	0.291697854	-0.374413506	0.21000816
## sports39	-0.230313994	0.194206991	0.155248080	-0.09394900
## hobby40	0.115363426	-0.008855370	0.052235976	0.06128453
## nature41	0.129344250	-0.055523094	-0.093350848	0.14294400
## encyclopaedia44	0.003488096	0.093634749	0.001714275	-0.22356002
## videos50	-0.327543700	-0.268264797	0.279701605	-0.06530018
## nonbooks99	-0.734985890	0.188909392	-0.184713565	0.31971145
##	PC13	PC14	PC15	PC16
## fiction1	-0.0287672990	-0.01775985	-0.203240187	0.01254386
## classics3	-0.0940142680	0.02721463	-0.344532853	0.38420608
## cartoons5	0.0125394735	-0.13738545	0.004937474	-0.32746743
## legends6	-0.7595703150	0.02007183	0.051896301	-0.16452973
## philosophy7	0.0957868971	0.17901466	0.016223947	0.05932556
## religion8	0.1812415558	0.22273787	0.194531016	-0.23580279
## psychology9	-0.1258835324	-0.45451419	-0.211588674	-0.03853946
## linguistics10	-0.1264129682	-0.25437830	0.286252681	0.24874834
## art12	0.1757710893	0.06965268	-0.064222606	0.30785547
## music14	0.1435747595	0.20955634	-0.138831931	-0.22648927
## facsimile17	-0.0678934625	-0.05792525	0.023785336	-0.28301319
## history19	0.1272227243	0.01541438	0.060511008	-0.10823478
## conthist20	0.1293999750	-0.13964935	-0.043966121	-0.23534037
## economy21	-0.0903165588	-0.05283165	-0.121268266	-0.05316085
## politics22	-0.2699878256	0.15212477	0.032428649	0.14877640
## science23	0.0142985331	0.16167798	0.086927272	0.06881714
## compsci26	-0.0006140313	0.20782296	-0.606160576	0.05590386
## railroads27	-0.1192529230	-0.38899363	-0.008984671	0.12481036

## maps30	-0.2420734823	0.24793757	-0.032484549	-0.16327212
## travelguides31	0.0788937815	0.04729701	-0.054560386	-0.02596254
## health35	0.0643741715	0.04049857	0.125354968	-0.20827551
## cooking36	0.0109324785	-0.11492105	-0.081164338	-0.05864038
## learning37	-0.0069222315	-0.06864969	0.140278520	-0.04641809
## GamesRiddles38	0.0201866145	0.14117181	-0.073404628	0.07513419
## sports39	-0.0224926160	-0.09462443	-0.011221801	-0.06216445
## hobby40	0.0278182035	-0.07071010	0.061647484	0.15644531
## nature41	0.0161408739	0.09673235	0.347851951	0.15944036
## encyclopaedia44	0.1042427336	-0.08988946	0.206086275	0.17726537
## videos50	-0.1183147188	0.24093886	0.167038418	0.28859123
## nonbooks99	0.2427048841	-0.34005159	-0.073293310	0.05791654
##	PC17	PC18	PC19	PC20
## fiction1	0.14751663	0.094955273	-0.076686749	-8.367955e-02
## classics3	0.22114699	0.343820509	0.124637105	-5.767519e-02
## cartoons5	0.29895811	0.079998536	-0.132272967	-2.220739e-01
## legends6	-0.17698427	-0.151786390	-0.023907756	1.400636e-01
## philosophy7	-0.01181748	0.039510279	0.227697729	-3.058185e-01
## religion8	-0.07736380	-0.041152574	0.047495477	-1.410312e-01
## psychology9	0.03126585	-0.153079151	-0.195395234	1.238913e-01
## linguistics10	-0.26127534	-0.035778378	-0.091509080	7.957177e-02
## art12	-0.26256284	-0.084761304	0.110578932	2.656384e-01
## music14	0.01398212	-0.318085062	0.351979017	4.664153e-01
## facsimile17	0.16500915	0.034478430	0.009502880	-4.860818e-02
## history19	-0.17974117	0.027158410	-0.200448783	7.364999e-02
## conthist20	-0.02791317	0.170374954	-0.282809235	8.615710e-02
## economy21	-0.13059768	0.565515791	0.050770640	3.536180e-01
## politics22	0.03464452	-0.192770613	0.063229712	-6.816011e-02
## science23	0.21911284	-0.193784106	-0.046460395	-8.141755e-02
## compsci26	0.06598146	-0.324093751	-0.250420421	-5.684316e-02
## railroads27	0.21108295	-0.079837065	0.458467970	-2.019241e-01
## maps30	0.08039814	0.155127609	0.064783526	-4.816098e-05
## travelguides31	-0.22268398	0.033975735	-0.004811957	-4.498838e-02
## health35	0.01614319	0.118521805	0.075728042	-8.720717e-02
## cooking36	-0.44171775	-0.104580970	-0.072107304	-4.298604e-01
## learning37	-0.05020078	0.008027111	0.419096978	-9.385512e-03
## GamesRiddles38	-0.15682862	0.212705341	0.013753343	-1.897243e-02
## sports39	0.06717368	-0.021080811	0.027532922	-3.261308e-02
## hobby40	0.12879762	-0.020989294	0.006419256	-1.419270e-02
## nature41	0.42687200	0.008170305	-0.246034380	2.467588e-01
## encyclopaedia44	0.04664814	-0.233546819	-0.151424952	7.392612e-02
## videos50	-0.06616424	0.134778587	-0.214729083	-1.893529e-01
## nonbooks99	-0.01497984	-0.030714645	0.022366465	6.056138e-02
##	PC21	PC22	PC23	PC24
## fiction1	-0.01495170	0.015527098	0.013865255	0.063446777
## classics3	0.11070023	0.162584582	0.231410316	0.129152858
## cartoons5	-0.22283612	-0.395700289	-0.293266422	-0.026530325
## legends6	-0.09077110	-0.032176458	0.112923710	-0.097958678
## philosophy7	0.13600108	0.084672373	-0.232678492	-0.372473875
## religion8	-0.14626297	0.029681013	-0.079119110	-0.107678699

## psychology9	-0.08780183	0.024248340	0.028435629	-0.038495454
## linguistics10	0.16792531	0.197898193	-0.478194274	0.249098546
## art12	-0.38143417	-0.419508325	-0.067109104	0.010885221
## music14	0.37281439	0.091754670	-0.085757122	0.004026790
## facsimile17	0.14521103	0.122025683	0.018888928	-0.029425795
## history19	-0.06694532	0.081678118	0.051720417	0.095702951
## conthist20	0.08538941	0.174001717	0.237299618	0.110449580
## economy21	0.18588426	-0.280975580	-0.125070635	-0.207072442
## politics22	-0.00955483	0.006800011	0.006222293	0.020944405
## science23	0.32452770	-0.455747725	0.126433035	0.518718534
## compsci26	-0.16468865	0.189595911	-0.176000642	-0.067636151
## railroads27	0.03712564	-0.012370068	-0.145460211	-0.155238115
## maps30	0.02243540	-0.054024123	-0.035182517	0.016539842
## travelguides31	-0.18475031	0.119084571	-0.110270878	0.013821863
## health35	-0.13136428	0.122278781	0.153239895	0.037780797
## cooking36	0.38602719	-0.037309746	0.059371872	0.017834016
## learning37	-0.35652833	0.236161237	0.305954493	0.272690118
## GamesRiddles38	0.07265507	0.073417195	0.028352052	-0.057005638
## sports39	0.05273727	-0.065463098	0.038170865	0.001702625
## hobby40	-0.11440188	-0.063485781	0.023267612	-0.002501256
## nature41	0.02577973	0.293096946	-0.205855378	-0.073166647
## encyclopaedia44	0.12513206	-0.136740173	0.469720271	-0.551273082
## videos50	-0.01513614	0.003536195	0.051816406	-0.023812105
## nonbooks99	0.04798760	0.036434430	0.010311781	0.045396339
##	PC25	PC26	PC27	PC28
## fiction1	0.037903831	-0.265449862	-0.6867995384	0.283837547
## classics3	0.187666557	0.081390606	0.3744931047	-0.072030884
## cartoons5	-0.137469782	0.075117298	0.2545230758	-0.093748710
## legends6	-0.049082157	0.013133567	0.0451596574	-0.008308922
## philosophy7	-0.456917782	0.104630407	-0.1665175325	-0.056270106
## religion8	0.569603154	-0.019789635	0.1506695008	-0.099129130
## psychology9	0.039496609	-0.030356220	-0.0015661645	-0.031545457
## linguistics10	0.150263560	0.073436337	-0.0494888664	0.042857327
## art12	-0.119199253	0.275955832	0.0225958128	0.304632545
## music14	0.041031432	0.039710133	-0.0101029247	-0.074373935
## facsimile17	-0.056399865	-0.024953587	0.0071707892	0.049684356
## history19	-0.036286352	0.002503179	0.0170487749	-0.144182605
## conthist20	-0.210683166	0.266817840	-0.0378382122	0.027272204
## economy21	0.015955877	-0.121052254	0.0397259564	-0.066987898
## politics22	0.004439605	-0.037328997	-0.0080060032	-0.008473685
## science23	-0.067914171	-0.197289613	0.0486249292	0.026762057
## compsci26	0.019279319	0.087404268	0.1021495712	0.026725862
## railroads27	0.132975625	-0.031831907	0.0666468700	0.171947596
## maps30	0.016565015	0.197790474	-0.0960216268	0.020918146
## travelguides31	-0.095603486	-0.720153003	0.1574890323	-0.092043677
## health35	0.293884624	0.152674300	-0.0553092015	0.484484295
## cooking36	-0.074754057	0.190358711	0.1492495216	0.034833259
## learning37	-0.340004458	0.001409776	0.0579154087	-0.127249761
## GamesRiddles38	0.001215105	-0.027049950	0.0038374289	0.013626330
## sports39	-0.010956601	-0.010575076	-0.0005887391	0.033569432

## hobby40	0.187614943	0.223130216	-0.3751072765	-0.667894496
## nature41	-0.206331619	0.032691334	0.1991641300	0.148361718
## encyclopaedia44	0.041436958	-0.130330983	0.0518000845	0.034422311
## videos50	0.004779417	0.007641183	-0.0347014573	0.002765571
## nonbooks99	-0.018751467	-0.015421107	0.0101737490	0.006020294
##	PC29	PC30		
## fiction1	-0.303787533	0.0261921889		
## classics3	0.097252318	0.0088035680		
## cartoons5	0.083787435	0.0443130785		
## legends6	0.068656281	-0.0564330271		
## philosophy7	0.193011477	-0.0136262605		
## religion8	-0.411804698	-0.2147489841		
## psychology9	-0.041739771	0.0113538617		
## linguistics10	0.110775666	-0.0823875060		
## art12	-0.034122789	-0.1253333246		
## music14	0.070198437	0.0246661896		
## facsimile17	0.005535565	-0.0564196534		
## history19	0.002009627	0.7940463914		
## conthist20	0.043911785	-0.4557538780		
## economy21	-0.157720614	0.0439408105		
## politics22	0.007900444	0.0134132182		
## science23	0.049533549	-0.0442195988		
## compsci26	-0.043464668	0.0143681778		
## railroads27	-0.092877656	0.0857657106		
## maps30	-0.064167691	0.0093677603		
## travelguides31	0.285924960	-0.2203826081		
## health35	0.533613036	0.1061382752		
## cooking36	-0.233377926	0.0134991845		
## learning37	-0.303008711	0.0154870947		
## GamesRiddles38	-0.002334941	-0.0087207003		
## sports39	-0.023565323	0.0233531720		
## hobby40	0.213012808	-0.0988808749		
## nature41	-0.228238335	0.0025915919		
## encyclopaedia44	0.036432604	-0.0001643334		
## videos50	-0.057897715	0.0277461862		
## nonbooks99	-0.010408845	-0.0001481261		

```
##
## Loadings:
##
```

	Factor1	Factor2	Factor3
## classics3	0.173	0.365	0.195
## religion8	0.354	0.470	0.156
## psychology9	0.287	0.112	
## linguistics10	0.453	0.299	
## art12	0.104	0.451	0.361
## music14	0.226	0.272	0.287
## history19	0.161	0.808	0.217
## conthist20	0.153	0.568	0.102
## economy21	0.474		0.193
## science23	0.463	0.305	0.192

```

## compsci26      0.410      0.168
## travelguides31 0.162    0.429    0.490
## health35       0.559    0.109    0.393
## cooking36      0.188    0.117    0.520
## learning37     0.610      0.188
## hobby40        0.302    0.243    0.593
## nature41       0.219    0.179    0.498
## encyclopaedia44 0.453    0.307    0.186
##
##               Factor1 Factor2 Factor3
## SS loadings    2.252    2.223    1.777
## Proportion Var 0.125    0.123    0.099
## Cumulative Var 0.125    0.249    0.347

```