PCA_Thesis

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
## Warning: package 'FactoMineR' was built under R version 3.4.4

## Loading required package: ggplot2

## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa

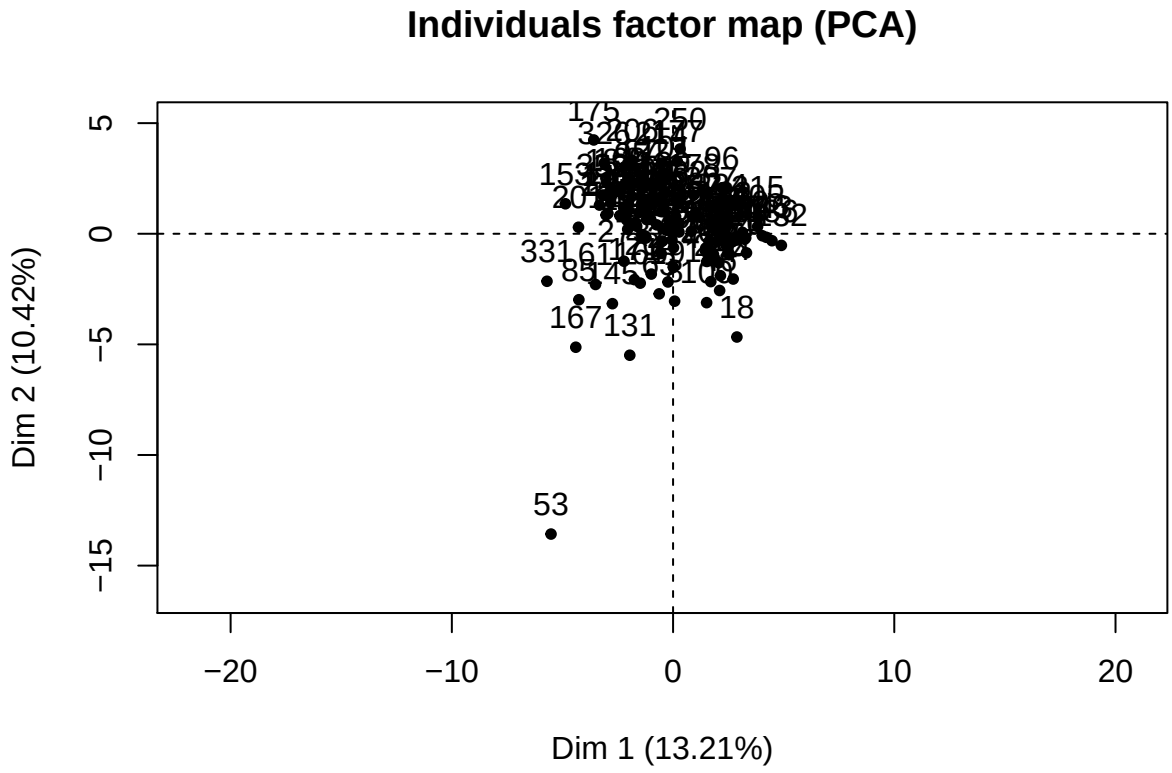
## -- Attaching packages --------------------------------------- tidyverse 1.3.0 --

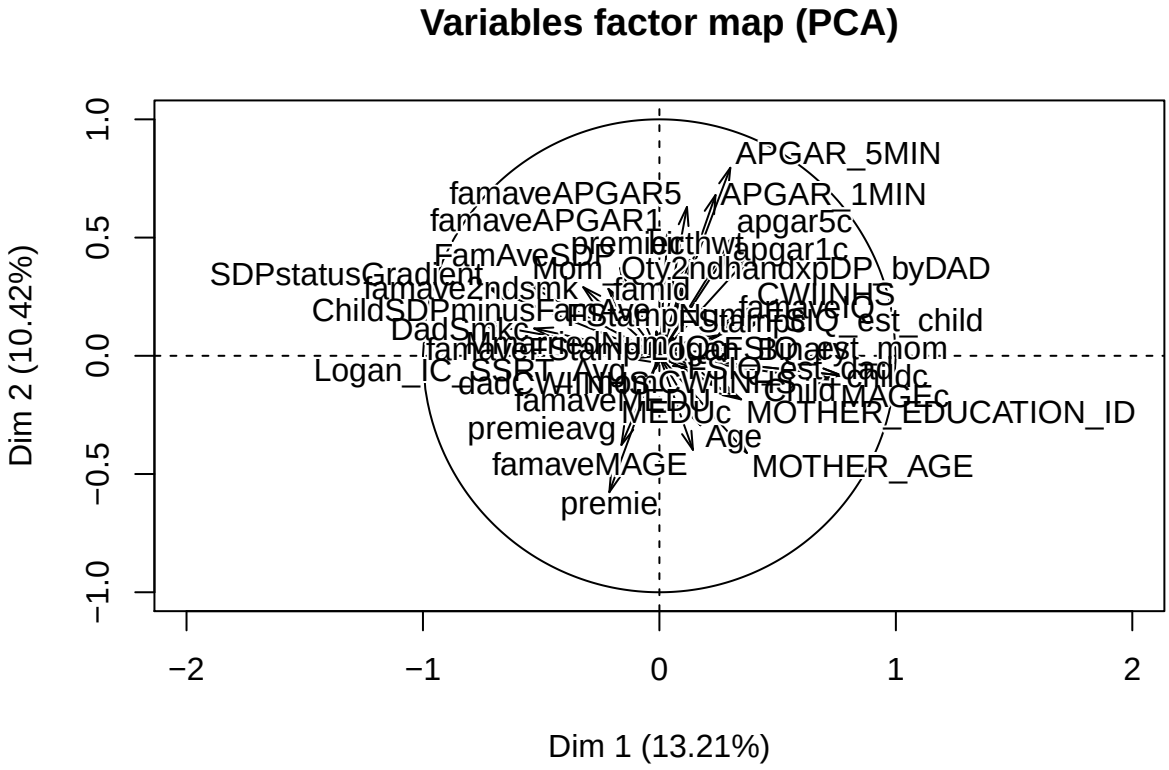
## v tibble  3.0.4     v dplyr   1.0.2
## v readr   1.3.1     v stringr 1.4.0
## v purrr   0.3.4     v forcats 0.5.0

## Warning: package 'readr' was built under R version 3.4.4

## Warning: package 'stringr' was built under R version 3.4.4

## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```






```
## **Results for the Principal Component Analysis (PCA)**
## The analysis was performed on 128 individuals, described by 40 variables
## *The results are available in the following objects:
##
##    name               description
## 1  "$eig"             "eigenvalues"
## 2  "$var"             "results for the variables"
## 3  "$var$coord"       "coord. for the variables"
## 4  "$var$cor"         "correlations variables - dimensions"
## 5  "$var$cos2"        "cos2 for the variables"
## 6  "$var$contrib"     "contributions of the variables"
## 7  "$ind"             "results for the individuals"
## 8  "$ind$coord"       "coord. for the individuals"
## 9  "$ind$cos2"        "cos2 for the individuals"
## 10 "$ind$contrib"     "contributions of the individuals"
## 11 "$call"            "summary statistics"
## 12 "$call$centre"     "mean of the variables"
## 13 "$call$ecart.type" "standard error of the variables"
## 14 "$call$row.w"      "weights for the individuals"
## 15 "$call$col.w"      "weights for the variables"
```

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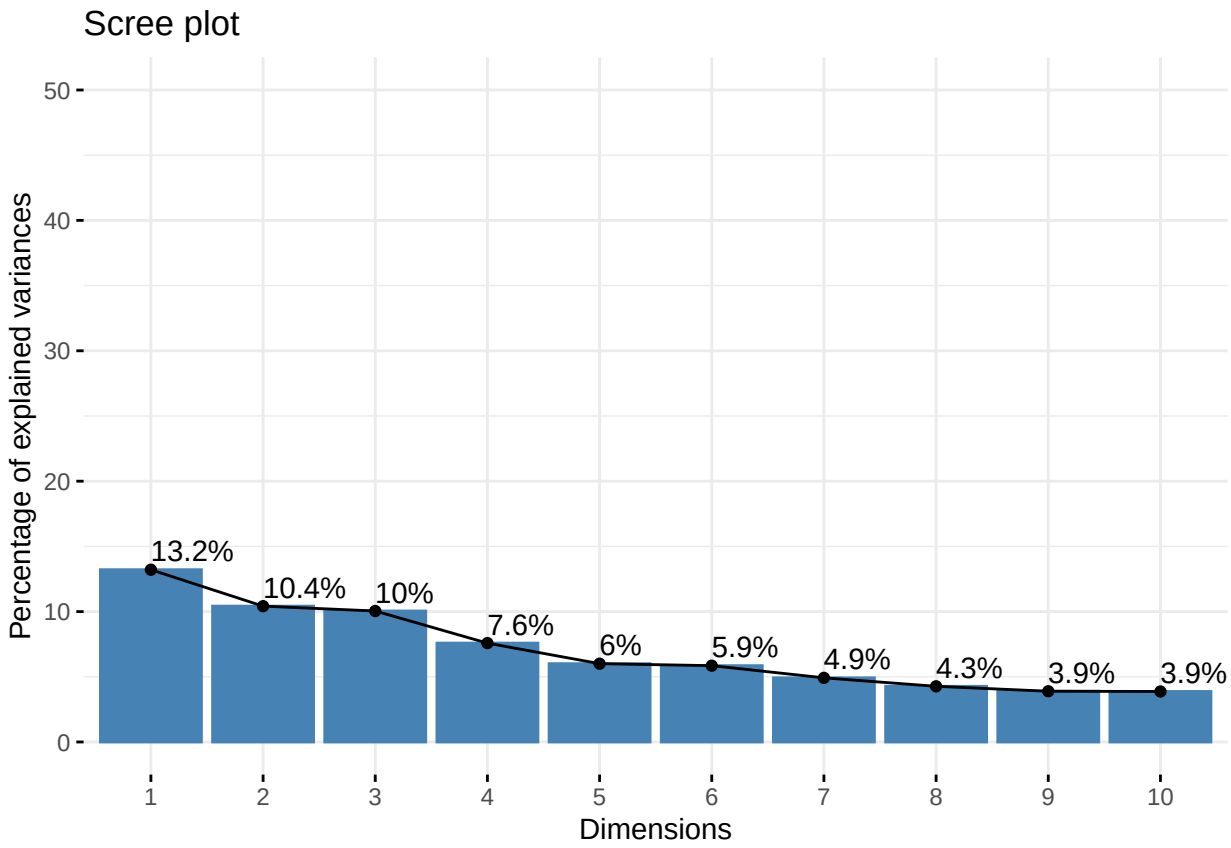
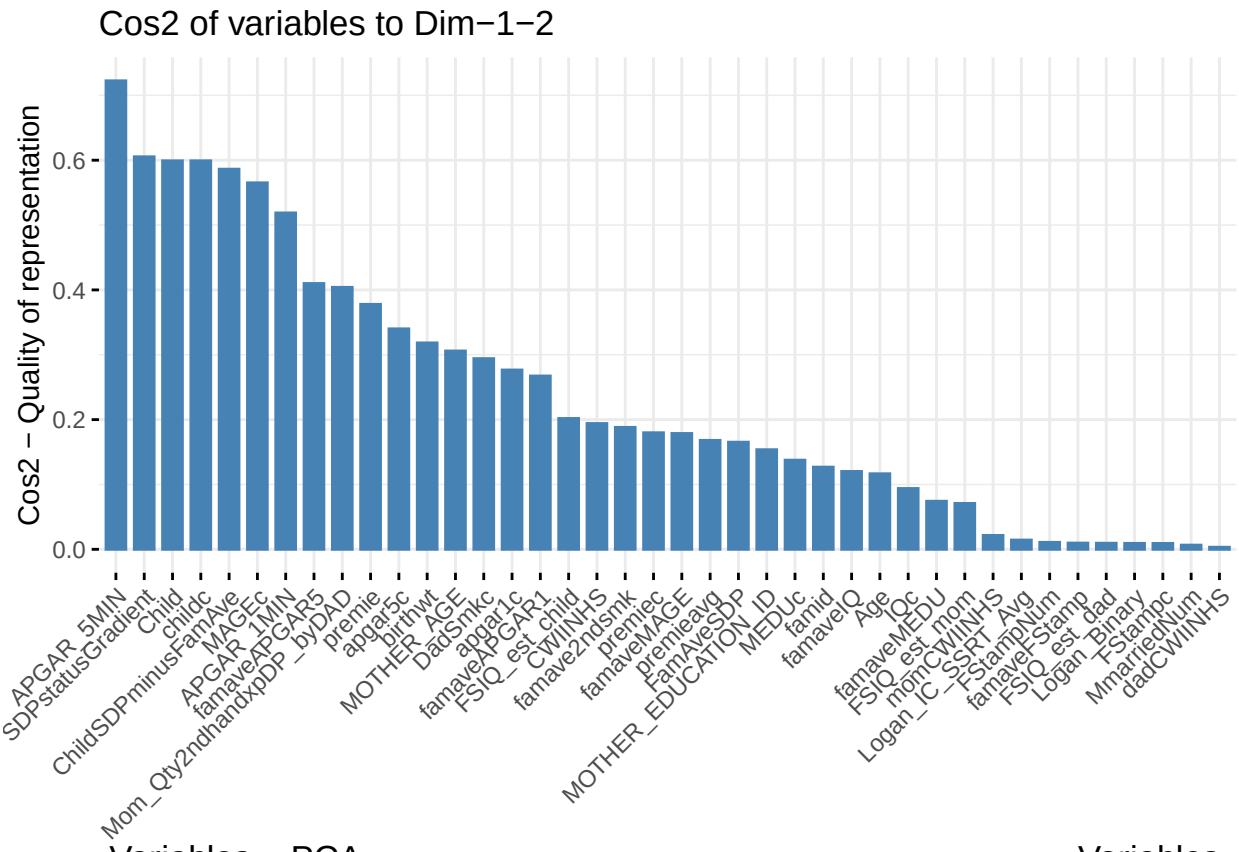
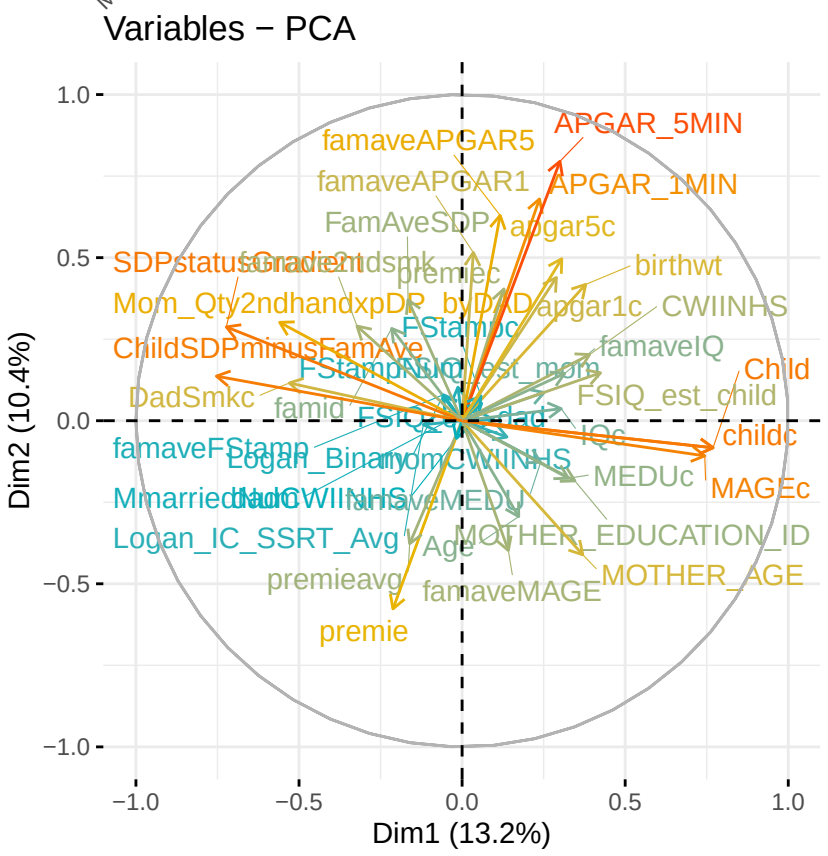
```

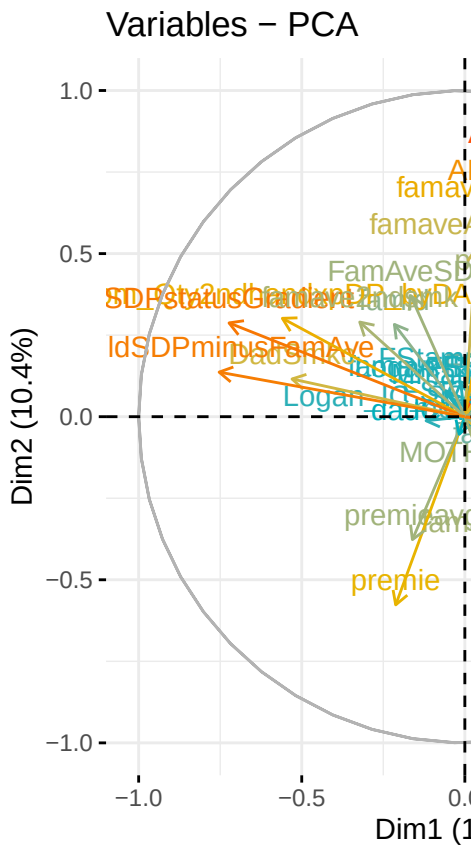
```
##          eigenvalue variance.percent cumulative.variance.percent
## Dim.1  5.283890e+00     1.320973e+01                      13.20973
## Dim.2  4.166473e+00     1.041618e+01                      23.62591
## Dim.3  4.017550e+00     1.004387e+01                      33.66978
## Dim.4  3.032316e+00     7.580791e+00                      41.25057
## Dim.5  2.401902e+00     6.004756e+00                      47.25533
## Dim.6  2.340688e+00     5.851721e+00                      53.10705
## Dim.7  1.967491e+00     4.918729e+00                      58.02578
## Dim.8  1.707311e+00     4.268277e+00                      62.29406
## Dim.9  1.556281e+00     3.890701e+00                      66.18476
## Dim.10 1.548752e+00     3.871880e+00                      70.05664
## Dim.11 1.257064e+00     3.142661e+00                      73.19930
## Dim.12 1.121177e+00     2.802942e+00                      76.00224
## Dim.13 1.066625e+00     2.666563e+00                      78.66880
## Dim.14 1.030309e+00     2.575773e+00                      81.24457
## Dim.15 9.439884e-01     2.359971e+00                      83.60455
## Dim.16 8.783437e-01     2.195859e+00                      85.80041
## Dim.17 7.150503e-01     1.787626e+00                      87.58803
## Dim.18 6.611091e-01     1.652773e+00                      89.24080
## Dim.19 6.255249e-01     1.563812e+00                      90.80462
## Dim.20 5.416379e-01     1.354095e+00                      92.15871
## Dim.21 5.113555e-01     1.278389e+00                      93.43710
## Dim.22 4.293625e-01     1.073406e+00                      94.51051
## Dim.23 3.986607e-01     9.966518e-01                      95.50716
## Dim.24 3.706367e-01     9.265918e-01                      96.43375
## Dim.25 3.421852e-01     8.554631e-01                      97.28921
## Dim.26 3.175787e-01     7.939467e-01                      98.08316
## Dim.27 2.871278e-01     7.178195e-01                      98.80098
## Dim.28 2.462668e-01     6.156671e-01                      99.41665
## Dim.29 1.265368e-01     3.163420e-01                      99.73299
## Dim.30 1.068051e-01     2.670127e-01                     100.00000
## Dim.31 1.042064e-30     2.605159e-30                     100.00000
## Dim.32 2.715078e-31     6.787694e-31                     100.00000
## Dim.33 2.713158e-31     6.782894e-31                     100.00000
## Dim.34 1.868705e-31     4.671762e-31                     100.00000
## Dim.35 1.797648e-31     4.494119e-31                     100.00000
## Dim.36 1.695872e-31     4.239681e-31                     100.00000
## Dim.37 1.033624e-31     2.584060e-31                     100.00000
## Dim.38 4.060900e-32     1.015225e-31                     100.00000
## Dim.39 3.621945e-32     9.054862e-32                     100.00000
## Dim.40 1.989386e-32     4.973465e-32                     100.00000
```




```
## Principal Component Analysis Results for variables
##  ===================================================
##   Name       Description
## 1 "$coord"   "Coordinates for the variables"
## 2 "$cor"     "Correlations between variables and dimensions"
## 3 "$cos2"    "Cos2 for the variables"
## 4 "$contrib" "contributions of the variables"
```

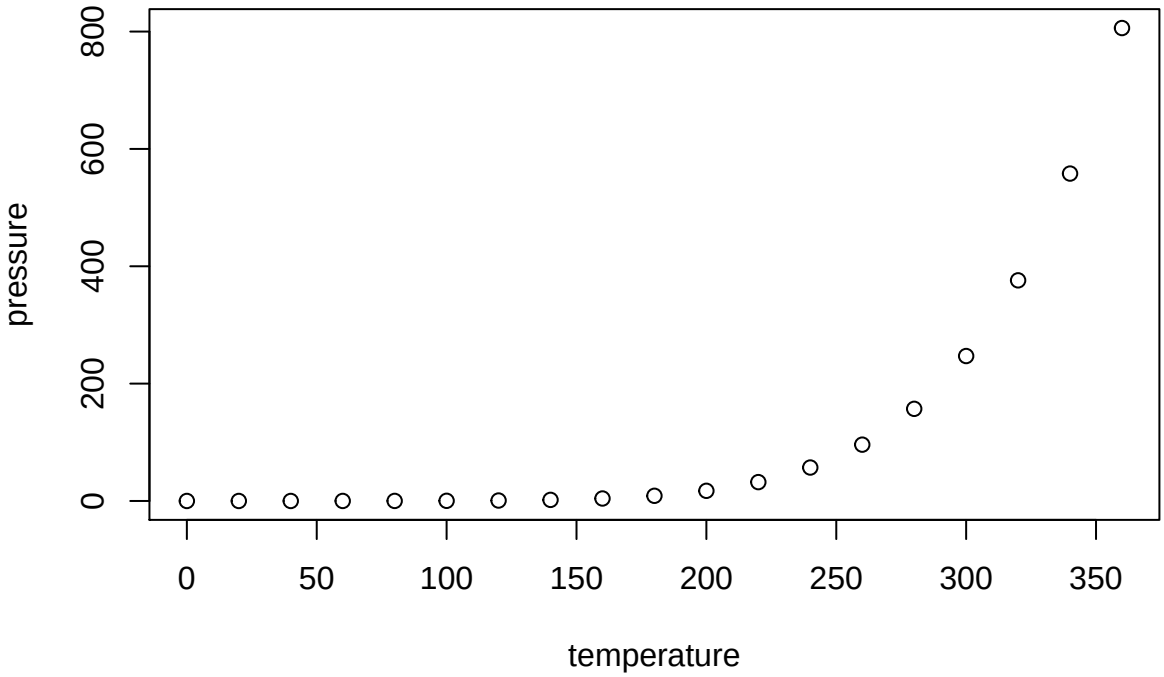

Cos2 of variables to Dim−1−2
Cos2 − Quality of representation
0.0
0.2
0.4
0.6
APGAR_5MIN
SDPstatusGradient
Child
childc
ChildSDPminusFamAve
MAGEc
APGAR_1MIN
famaveAPGAR5
Mom_Qty2ndhandxpDP_byDAD
premie
apgar5c
birthwt
MOTHER_AGE
DadSmkc
apgar1c
famaveAPGAR1
FSIQ_est_child
CWIINHS
famave2ndsmk
premiec
famaveMAGE
premieavg
FamAveSDP
MOTHER_EDUCATION_ID
MEDUc
famaveIQ
Age
IQc
famaveMEDU
FSIQ_est_mom
momCWIINHS
Logan_IC_SSRT_Avg
FStampNum
famaveFStamp
FSIQ_est_dad
Logan_Binary
FStampc
MmarriedNum
dadCWIINHS


Variables − PCA
Dim2 (10.4%)
Dim1 (13.2%)
1.0
0.5
0.0
−0.5
−1.0
APGAR_5MIN
famaveAPGAR5
famaveAPGAR1
APGAR_1MIN
FamAveSDP
apgar5c
SDPstatusGradient
famave2ndsmk
premiec
birthwt
Mom_Qty2ndhandxpDP_byDAD
apgar1c
CWIINHS
FStampc
famaveIQ
ChildSDPminusFamAve
Child
FSIQ_est_mom
DadSmkc
famid
FSIQ_est_child
childc
famaveFStamp
Logan_Binary
momCWIINHS
MEDUc
MAGEc
MmarriedNum
dadCWIINHS
famaveMEDU
Logan_IC_SSRT_Avg
Age
MOTHER_EDUCATION_ID
MOTHER_AGE
premieavg
famaveMAGE
premie
cos2
0.6
0.4
0.2


Variables − PCA
Dim2 (10.4%)
1.0
0.5
0.0
−0.5
−1.0
premie

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.