Übungsaufgabe 12

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Benutzen Sie den ALLBUS 2008 Datensatz

allbus2008 <- read\_spss("allbus2008.sav")

**V71 VERTRAUEN:** GESUNDHEITSWESEN

**V72 VERTRAUEN:** BUNDESVERFASSUNGSGERICHT

**V73 VERTRAUEN:** BUNDESTAG

**V74 VERTRAUEN:** STADT-,GEMEINDEVERWALTUNG

**V75 VERTRAUEN:** JUSTIZ

**V76 VERTRAuEN:** FERNSEHEN

**V77 VERTRAUEN:** ZEITUNGSWESEN

**V78 VERTRAUEN:** HOCHSCHULEN,UNIVERSITAETEN

**V79 VERTRAUEN:** BUNDESREGIERUNG

**V80 VERTRAUEN:** POLIZEI

**V81 VERTRAUEN:** POLITISCHE PARTEIEN

**V82 VERTRAUEN:** KOMMISSION DER EU

**V83 VERTRAUEN:** EUROPAEISCHES PARLAMENT

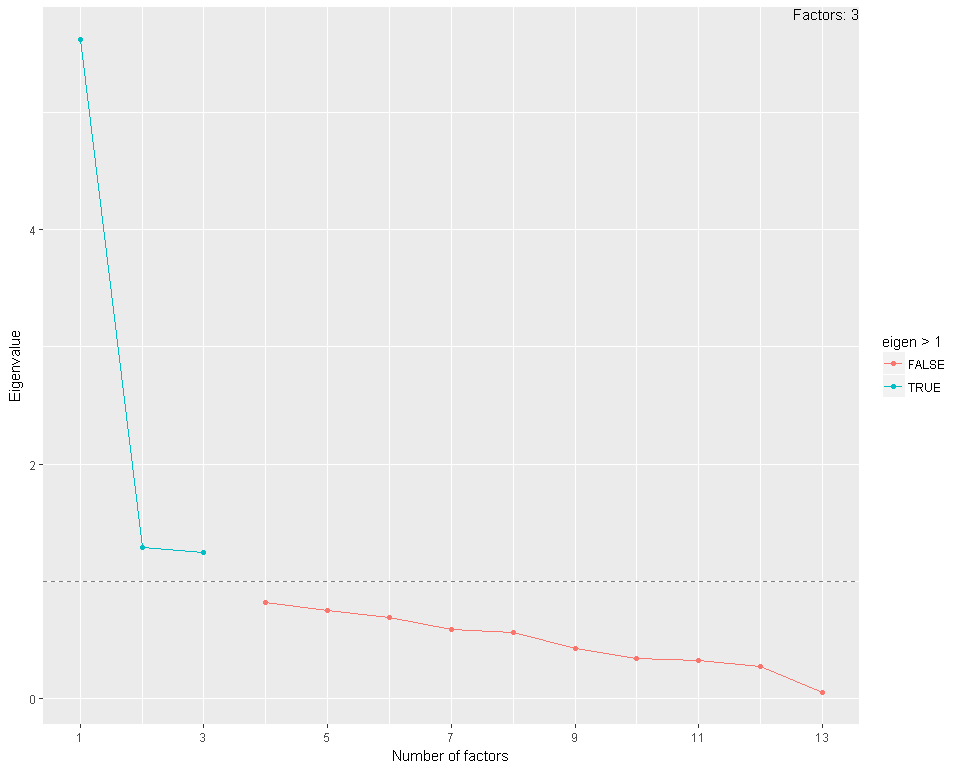
## Aufgabe 1

*Berechnen Sie eine PCA (Oblimin Rotation) mit den Variablen v71 - v83.*

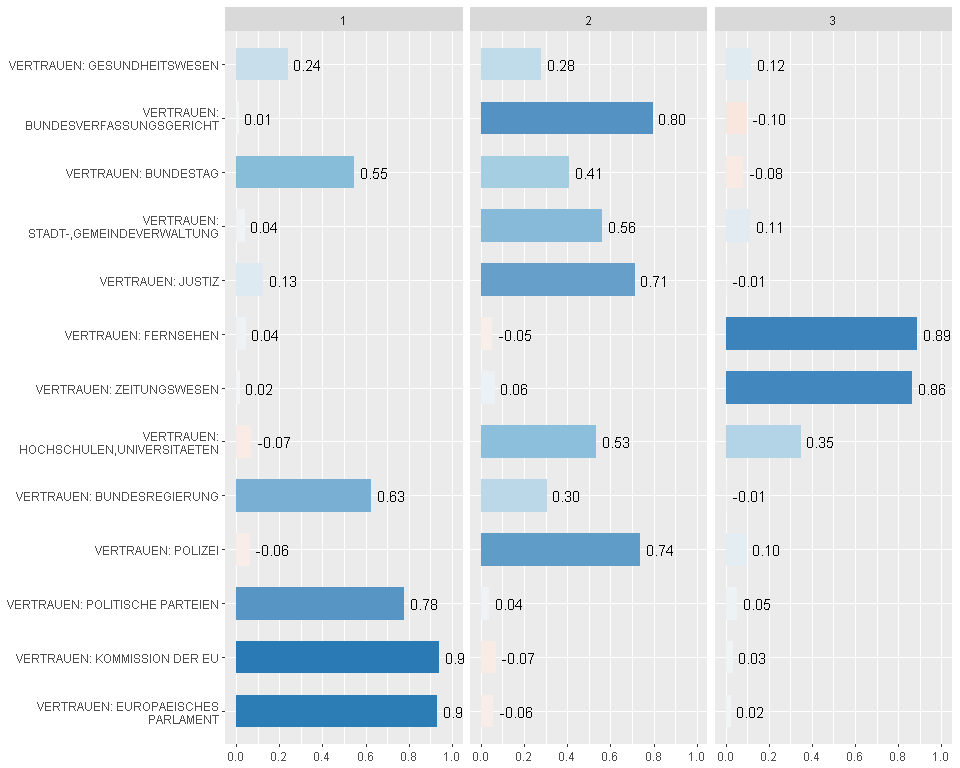
obl\_pca <- allbus2008 %>%   
 select(V71:V83) %>%   
 pca(rotate = "oblimin")  
  
obl\_pca

## Principal Components Analysis  
## Call: principal(r = r, nfactors = nfactors, residuals = residuals,   
## rotate = rotate, n.obs = n.obs, covar = covar, scores = scores,   
## missing = missing, impute = impute, oblique.scores = oblique.scores,   
## method = method)  
## Standardized loadings (pattern matrix) based upon correlation matrix  
## PC1 h2 u2 com  
## V71 0.50 0.25 0.75 1  
## V72 0.60 0.36 0.64 1  
## V73 0.76 0.58 0.42 1  
## V74 0.55 0.30 0.70 1  
## V75 0.68 0.46 0.54 1  
## V76 0.50 0.25 0.75 1  
## V77 0.56 0.31 0.69 1  
## V78 0.57 0.32 0.68 1  
## V79 0.79 0.62 0.38 1  
## V80 0.60 0.36 0.64 1  
## V81 0.74 0.54 0.46 1  
## V82 0.78 0.61 0.39 1  
## V83 0.78 0.60 0.40 1  
##   
## PC1  
## SS loadings 5.58  
## Proportion Var 0.43  
##   
## Mean item complexity = 1  
## Test of the hypothesis that 1 component is sufficient.  
##   
## The root mean square of the residuals (RMSR) is 0.1   
## with the empirical chi square 5623.11 with prob < 0   
##   
## Fit based upon off diagonal values = 0.93

sjp.pca(allbus2008 %>% select(V71:V83),   
 rotation = "oblimin", # Wähle die Rotation (ansonsten: "varimax")  
 plot.eigen = T) # Plot um die Eigenvalues anzuzeigen



## Importance of components:  
## PC1 PC2 PC3 PC4 PC5 PC6  
## Standard deviation 2.3702 1.13525 1.11533 0.90367 0.8691 0.83132  
## Proportion of Variance 0.4321 0.09914 0.09569 0.06282 0.0581 0.05316  
## Cumulative Proportion 0.4321 0.53126 0.62695 0.68977 0.7479 0.80103  
## PC7 PC8 PC9 PC10 PC11 PC12  
## Standard deviation 0.76894 0.74966 0.65505 0.58456 0.57416 0.52689  
## Proportion of Variance 0.04548 0.04323 0.03301 0.02629 0.02536 0.02135  
## Cumulative Proportion 0.84651 0.88974 0.92275 0.94904 0.97439 0.99575  
## PC13  
## Standard deviation 0.23507  
## Proportion of Variance 0.00425  
## Cumulative Proportion 1.00000  
## [1] 5.61763469 1.28879147 1.24395257 0.81662762 0.75530559 0.69110041  
## [7] 0.59126686 0.56198935 0.42909056 0.34170866 0.32966438 0.27760982  
## [13] 0.05525802



### Aufgabe 1a

*Welche Faktoren/Dimensionen können Sie identifizieren und wie würden Sie diese inhaltlich benennen?*

### Aufgabe 1b

*Beurteilen Sie alle Variablen hinsichtlich Ihrer Passung auf die identifizierten Faktoren/Dimensionen. Berücksichtigen Sie dabei Konvergenz- und Diskriminanzvalidität, inhaltliche Aspekte als auch Kommunalitäten.*

## Aufgabe 2

*Berechnen Sie evtl. eine zweite PCA (Oblimin Rotation) nur mit den geeigneten Variablen.*

trust\_pca <- allbus2008 %>%   
 select(V73, V79, V81, V82, V83) %>%   
 pca(rotate = "oblimin")  
  
trust\_pca

## Principal Components Analysis  
## Call: principal(r = r, nfactors = nfactors, residuals = residuals,   
## rotate = rotate, n.obs = n.obs, covar = covar, scores = scores,   
## missing = missing, impute = impute, oblique.scores = oblique.scores,   
## method = method)  
## Standardized loadings (pattern matrix) based upon correlation matrix  
## PC1 h2 u2 com  
## V73 0.78 0.61 0.39 1  
## V79 0.82 0.67 0.33 1  
## V81 0.82 0.67 0.33 1  
## V82 0.89 0.79 0.21 1  
## V83 0.88 0.78 0.22 1  
##   
## PC1  
## SS loadings 3.52  
## Proportion Var 0.70  
##   
## Mean item complexity = 1  
## Test of the hypothesis that 1 component is sufficient.  
##   
## The root mean square of the residuals (RMSR) is 0.12   
## with the empirical chi square 1051.15 with prob < 0.0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000051   
##   
## Fit based upon off diagonal values = 0.96

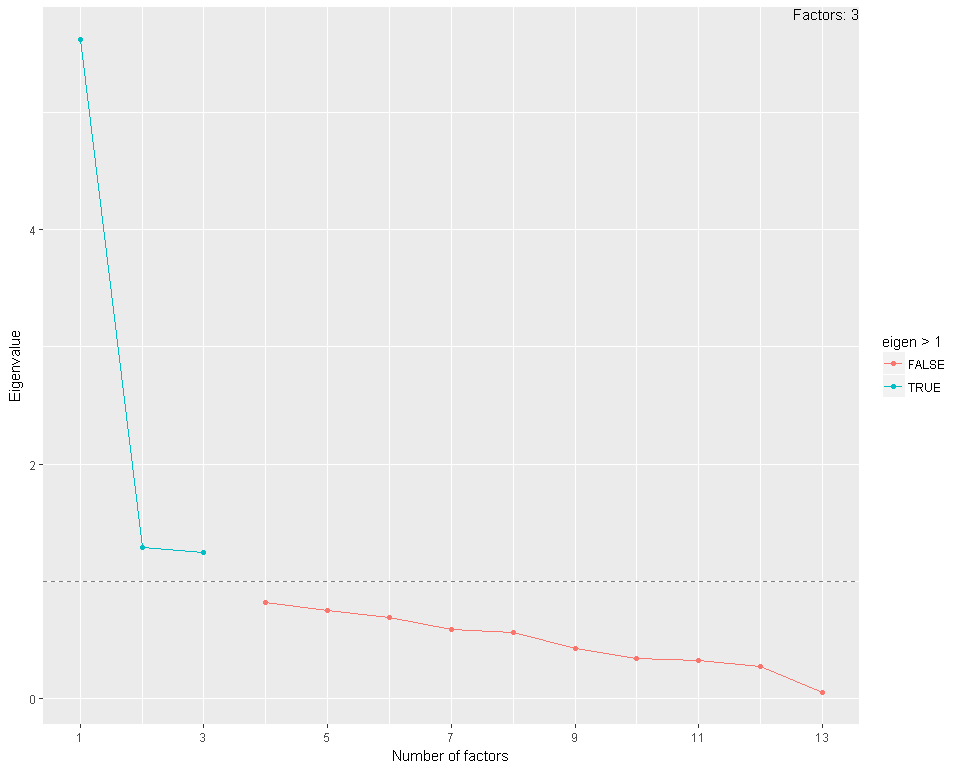
## Aufgabe 3

*Berechnen Sie eine zweite/dritte PCA (Varimax Rotation) mit den gleichen Variablen aus Aufgabe 2 oder 3.*

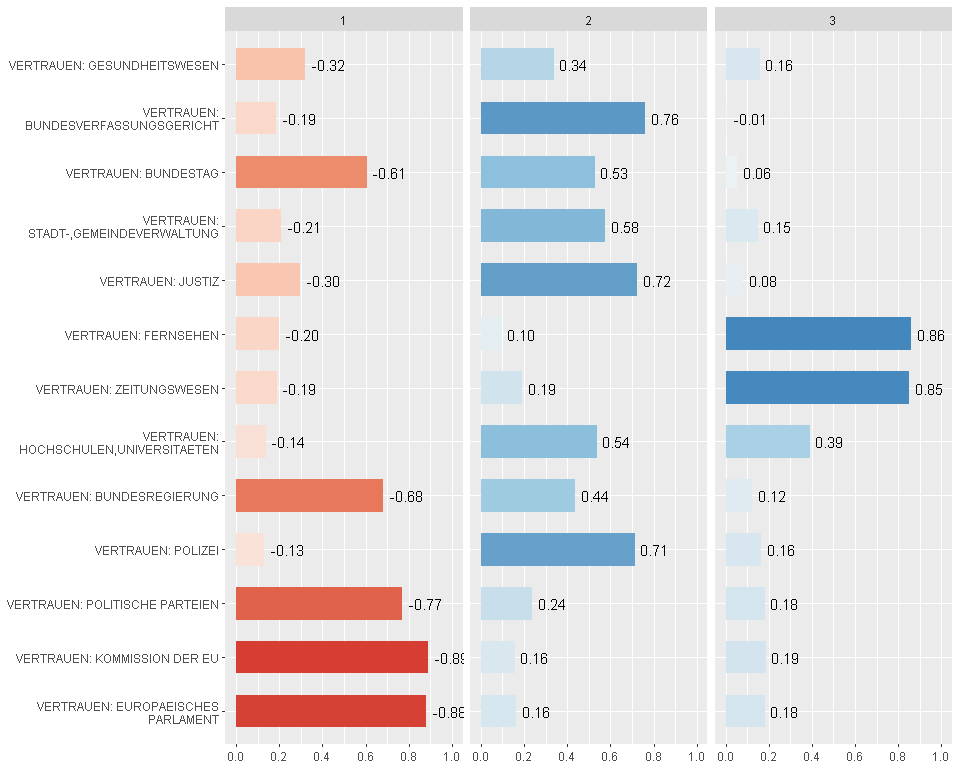
var\_pca <- allbus2008 %>%   
 select(V71:V83) %>%   
 pca(rotate = "varimax")  
  
var\_pca

## Principal Components Analysis  
## Call: principal(r = r, nfactors = nfactors, residuals = residuals,   
## rotate = rotate, n.obs = n.obs, covar = covar, scores = scores,   
## missing = missing, impute = impute, oblique.scores = oblique.scores,   
## method = method)  
## Standardized loadings (pattern matrix) based upon correlation matrix  
## PC1 h2 u2 com  
## V71 0.50 0.25 0.75 1  
## V72 0.60 0.36 0.64 1  
## V73 0.76 0.58 0.42 1  
## V74 0.55 0.30 0.70 1  
## V75 0.68 0.46 0.54 1  
## V76 0.50 0.25 0.75 1  
## V77 0.56 0.31 0.69 1  
## V78 0.57 0.32 0.68 1  
## V79 0.79 0.62 0.38 1  
## V80 0.60 0.36 0.64 1  
## V81 0.74 0.54 0.46 1  
## V82 0.78 0.61 0.39 1  
## V83 0.78 0.60 0.40 1  
##   
## PC1  
## SS loadings 5.58  
## Proportion Var 0.43  
##   
## Mean item complexity = 1  
## Test of the hypothesis that 1 component is sufficient.  
##   
## The root mean square of the residuals (RMSR) is 0.1   
## with the empirical chi square 5623.11 with prob < 0   
##   
## Fit based upon off diagonal values = 0.93

sjp.pca(allbus2008 %>% select(V71:V83),   
 rotation = "varimax", # Wähle die Rotation (ansonsten: "varimax")  
 plot.eigen = T) # Plot um die Eigenvalues anzuzeigen



## Importance of components:  
## PC1 PC2 PC3 PC4 PC5 PC6  
## Standard deviation 2.3702 1.13525 1.11533 0.90367 0.8691 0.83132  
## Proportion of Variance 0.4321 0.09914 0.09569 0.06282 0.0581 0.05316  
## Cumulative Proportion 0.4321 0.53126 0.62695 0.68977 0.7479 0.80103  
## PC7 PC8 PC9 PC10 PC11 PC12  
## Standard deviation 0.76894 0.74966 0.65505 0.58456 0.57416 0.52689  
## Proportion of Variance 0.04548 0.04323 0.03301 0.02629 0.02536 0.02135  
## Cumulative Proportion 0.84651 0.88974 0.92275 0.94904 0.97439 0.99575  
## PC13  
## Standard deviation 0.23507  
## Proportion of Variance 0.00425  
## Cumulative Proportion 1.00000  
## [1] 5.61763469 1.28879147 1.24395257 0.81662762 0.75530559 0.69110041  
## [7] 0.59126686 0.56198935 0.42909056 0.34170866 0.32966438 0.27760982  
## [13] 0.05525802



trust\_var\_pca <- allbus2008 %>%   
 select(V73, V79, V81, V82, V83) %>%   
 pca(rotate = "varimax")  
  
trust\_var\_pca

## Principal Components Analysis  
## Call: principal(r = r, nfactors = nfactors, residuals = residuals,   
## rotate = rotate, n.obs = n.obs, covar = covar, scores = scores,   
## missing = missing, impute = impute, oblique.scores = oblique.scores,   
## method = method)  
## Standardized loadings (pattern matrix) based upon correlation matrix  
## PC1 h2 u2 com  
## V73 0.78 0.61 0.39 1  
## V79 0.82 0.67 0.33 1  
## V81 0.82 0.67 0.33 1  
## V82 0.89 0.79 0.21 1  
## V83 0.88 0.78 0.22 1  
##   
## PC1  
## SS loadings 3.52  
## Proportion Var 0.70  
##   
## Mean item complexity = 1  
## Test of the hypothesis that 1 component is sufficient.  
##   
## The root mean square of the residuals (RMSR) is 0.12   
## with the empirical chi square 1051.15 with prob < 0.0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000051   
##   
## Fit based upon off diagonal values = 0.96

### Aufgabe 3a

*Welche Unterschiede können Sie erkennen?*

### Aufgabe 3b

*Für welche Rotationsmethode würden Sie sich entscheiden und wieso?*