Lab Sesion 1

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```
library(haven)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(corrplot)
```

```
## corrplot 0.84 loaded
```

1. General introduction to the dataset

The European Social Survey is a survey conducted across Europe every two years via face-to-face interviews. The survey measures "attitude, beliefs and behavior patterns" on a representative sample of people aged 15 and over resident within private households. Here we consider the 4th edition, run in 2008 in Belgium.

More information

- Data documentation.
- Source questionnaire
- Data

2. Selection of variables for all the laboratories

We use a subset of 21 variables.

D15-17 & D18-20 & & D21 - 26 & D27 - 29 & D1 - 6: Part of the block D1-50: Welfare includes attitudes towards welfare provision, size of claimant groups, views on taxation, attitutdes towards service delivery and likely future dependence on welfare.

People have different views on what the responsibilities of governments should or should not be. For each of the tasks I read out please tell me on a score of 0-10 how much responsibility you think governments should have. 0 means it should not be governments? responsibility at all and 10 means it should be entirely governments? responsibility. Firstly to? (0 Not governments' responsibility at all - 10 Entirely governments' responsibility)

Welfare Support items:

- gvslvol Standard of living for the old, governments' responsibility
  - . . . **ensure a reasonable standard of living for the old?**
  - D15 - 17
- gvhlthc Health care for the sick, governments' responsibility
  - . . . **ensure adequate health care for the sick?**
  - D15 - 17
- gvjbevn Job for everyone, governments' responsibility
  - . . . **ensure a job for everyone who wants one?**
  - D15 - 17
- gvcldcr Child care services for working parents, governments' responsibility
  - . . . **ensure sufficient child care services for working parents?**
  - D18-20
- ggvslvue Standard of living for the unemployed, governments' responsibility
  - . . . **ensure a reasonable standard of living for the unemployed?**
  - D18-20
- gvpdlwk Paid leave from work to care for sick family, governments' responsibility
  - And how much responsibility do you think governments should have to. . . . . **provide paid leave from work for people who temporarily have to care for sick family members?**
  - D18-20

Economic Criticism items:

(D21-26) Using this card please tell me to what extent you agree or disagree that social benefits and services in [country]. . . (1 Agree strongly - 5 Disagree strongly)

- sbstrec Social benefits/services place too great strain on economy
  - . . . .**place too great a strain on the economy?**
  - D21 - 26
- sbbsntx Social benefits/services cost businesses too much in taxes/charges
  - . . . .**cost businesses too much in taxes and charges?**
  - D21 - 26

Social Criticism items:

- sbprvpv Social benefits/services prevent widespread poverty
  - . . . .**prevent widespread poverty?**
  - D21 - 26
- sbeqsoc Social benefits/services lead to a more equal society
  - . . . .**lead to a more equal society?**
  - D21 - 26
- sbcwkfm Social benefits/services make it easier to combine work and family
  - . . . .**make it easier for people to combine work and family life?**
  - D21 - 26

(D27-29) And to what extent do you agree or disagree that social benefits and services in [country]...

Moral Criticism items:

- sblazy Social benefits/services make people lazy
  - ...**make people lazy?**
  - D27 - 29
- sblwcoa Social benefits/services make people less willing care for one another
  - ...**make people less willing to care for one another?**
  - D27 - 29
- sblwlka Social benefits/services make people less willing look after themselves/family
  - ....**make people less willing to look after themselves and their family?**
  - D27 - 29

Other items:

(D1 - 6) Using this card, please say how much you agree or disagree with each of the following statements (1 Agree strongly - 5 Disagree strongly).

- dfincac Large differences in income acceptable to reward talents and efforts
  - **Large differences in people's incomes are acceptable to properly reward differences in talents and efforts**.
  - D1 - 6
- smdfslv For fair society, differences in standard of living should be small
  - **For a society to be fair, differences in people's standard of living should be small.**
  - D1 - 6

B30 -33: Part of the block D1-50: Politics, including: political interest, efficacy, trust, electoral and other forms of participation, party allegiance, socio-political orietnations.

Using this card, please say to what extent you agree or disagree with each of the following statements (1 Agree strongly - 5 Disagree strongly).

- gincdif Government should reduce differences in income levels
  - **The government should take measures to reduce differences in income levels**
- agea Respondent's age
- eduyrs Years of full-time education completed
- gndr Gender (1 Male, 2 Female)
- hinctnta Household's total net income, all sources (Deciles of the actual household income range in the given country.)

3. Variables used in laboratory session 1

Welfare Support items:

- gvslvol Standard of living for the old, governments' responsibility
- gvhlthc Health care for the sick, governments' responsibility
- gvjbevn Job for everyone, governments' responsibility
- gvcldcr Child care services for working parents, governments' responsibility
- ggvslvue Standard of living for the unemployed, governments' responsibility
- gvpdlwk Paid leave from work to care for sick family, governments' responsibility

2. Analysis plan

3. EFA

```
# Import data
ess_df <- haven::read_sav("data/ESS4_belgium.sav")

# EFA
str(ess_df)
```

```
## tibble [1,760 x 21] (S3: tbl_df/tbl/data.frame)
##  $ gvslvol : dbl+lbl [1:1760]  8,  7,  6,  6,  6, 10, 10,  7,  9,  8,  8,  8,  6,  ...
##    ..@ label      : chr "Standard of living for the old, governments' responsibility"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:14] 0 1 2 3 4 5 6 7 8 9 ...
##    .. ..- attr(*, "names")= chr [1:14] "Not governments' responsibility at all" "1" "2" "3" ...
##  $ gvslvue : dbl+lbl [1:1760]  7,  7,  3,  6,  4,  5,  6,  6,  6,  8,  6,  6,  3,  ...
##    ..@ label      : chr "Standard of living for the unemployed, governments' responsibility"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:14] 0 1 2 3 4 5 6 7 8 9 ...
##    .. ..- attr(*, "names")= chr [1:14] "Not governments' responsibility at all" "1" "2" "3" ...
##  $ gvhlthc : dbl+lbl [1:1760]  8,  8,  6,  6,  7, 10,  8,  9,  9,  8,  8,  8,  7,  ...
##    ..@ label      : chr "Health care for the sick, governments' responsibility"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:14] 0 1 2 3 4 5 6 7 8 9 ...
##    .. ..- attr(*, "names")= chr [1:14] "Not governments' responsibility at all" "1" "2" "3" ...
##  $ gvcldcr : dbl+lbl [1:1760]  5,  7,  5,  6,  5,  5,  6,  7,  5,  8,  7,  8,  4,  ...
##    ..@ label      : chr "Child care services for working parents, governments' responsibility"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:14] 0 1 2 3 4 5 6 7 8 9 ...
##    .. ..- attr(*, "names")= chr [1:14] "Not governments' responsibility at all" "1" "2" "3" ...
##  $ gvjbevn : dbl+lbl [1:1760]  8,  7,  3,  3,  6,  5,  8,  8,  5,  8,  6,  7,  5, 1...
##    ..@ label      : chr "Job for everyone, governments' responsibility"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:14] 0 1 2 3 4 5 6 7 8 9 ...
##    .. ..- attr(*, "names")= chr [1:14] "Not governments' responsibility at all" "1" "2" "3" ...
##  $ gvpdlwk : dbl+lbl [1:1760]  5,  6,  4,  3,  5,  7,  6,  8,  8,  8,  6,  7,  4,  ...
##    ..@ label      : chr "Paid leave from work to care for sick family, governments' responsibility"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:14] 0 1 2 3 4 5 6 7 8 9 ...
##    .. ..- attr(*, "names")= chr [1:14] "Not governments' responsibility at all" "1" "2" "3" ...
##  $ sbstrec : dbl+lbl [1:1760] 2, 4, 2, 3, 4, 3, 4, 4, 2, 4, 2, 1, 2, 4, 4, 4, 4, 4,...
##    ..@ label      : chr "Social benefits/services place too great strain on economy"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ sbbsntx : dbl+lbl [1:1760] 1, 3, 2, 2, 1, 2, 2, 3, 3, 3, 2, 3, 2, 4, 3, 4, 2, 4,...
##    ..@ label      : chr "Social benefits/services cost businesses too much in taxes/charges"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ sbprvpv : dbl+lbl [1:1760] 1, 2, 3, 2, 2, 2, 2, 2, 3, 2, 2, 4, 3, 2, 2, 2, 2, 2,...
##    ..@ label      : chr "Social benefits/services prevent widespread poverty"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
```

```
##  $ sbeqsoc : dbl+lbl [1:1760] 3, 2, 4, 2, 2, 2, 4, 2, 2, 2, 4, 4, 2, 2, 2, 2, 2, 3,...
##    ..@ label      : chr "Social benefits/services lead to a more equal society"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ sbcwkfm : dbl+lbl [1:1760] 2, 2, 3, 2, 2, 3, 3, 2, 3, 3, 4, 3, 2, 3, 2, 2, 2, 4,...
##    ..@ label      : chr "Social benefits/services make it easier to combine work and family"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ sblazy  : dbl+lbl [1:1760] 2, 4, 1, 3, 4, 2, 4, 3, 2, 3, 2, 3, 2, 5, 2, 4, 4, 2,...
##    ..@ label      : chr "Social benefits/services make people lazy"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ sblwcoa : dbl+lbl [1:1760] 2, 4, 1, 2, 3, 4, 3, 4, 2, 4, 2, 2, 4, 4, 2, 3, 4, 2,...
##    ..@ label      : chr "Social benefits/services make people less willing care for one another"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ sblwlka : dbl+lbl [1:1760] 2, 4, 1, 2, 3, 4, 4, 4, 3, 3, 2, 2, 2, 4, 1, 2, 4, 2,...
##    ..@ label      : chr "Social benefits/services make people less willing look after themselves/fami
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ agea    : dbl+lbl [1:1760] 36, 26, 69, 77, 27, 32, 19, 28, 49, 57, 71, 83, 46, 6...
##    ..@ label      : chr "Age of respondent, calculated"
##    ..@ format.spss: chr "F3.0"
##    ..@ labels     : Named num 999
##    .. ..- attr(*, "names")= chr "Not available"
##  $ eduyrs  : dbl+lbl [1:1760] 18, 15, 18, 15, 13, 12, 13, 17, 16, 16, 17, 16,  5, 1...
##    ..@ label      : chr "Years of full-time education completed"
##    ..@ format.spss: chr "F2.0"
##    ..@ labels     : Named num [1:3] 77 88 99
##    .. ..- attr(*, "names")= chr [1:3] "Refusal" "Don't know" "No answer"
##  $ gndr    : dbl+lbl [1:1760] 1, 2, 1, 2, 1, 2, 2, 2, 1, 1, 2, 2, 2, 2, 2, 1, 1, 1,...
##    ..@ label        : chr "Gender"
##    ..@ format.spss  : chr "F1.0"
##    ..@ display_width: int 6
##    ..@ labels       : Named num [1:3] 1 2 9
##    .. ..- attr(*, "names")= chr [1:3] "Male" "Female" "No answer"
##  $ hinctnta: dbl+lbl [1:1760]  4,  7, 10,  7,  7,  6,  8, 10,  4,  9,  7,  8, 10,  ...
##    ..@ label        : chr "Household's total net income, all sources"
##    ..@ format.spss  : chr "F2.0"
##    ..@ display_width: int 9
##    ..@ labels       : Named num [1:13] 1 2 3 4 5 6 7 8 9 10 ...
##    .. ..- attr(*, "names")= chr [1:13] "J - 1st decile" "R - 2nd decile" "C - 3rd decile" "M - 4th de
##  $ gincdif : dbl+lbl [1:1760]  2,  2,  4,  2,  3,  4,  4,  2,  1,  2,  4,  3,  3,  ...
##    ..@ label        : chr "Government should reduce differences in income levels"
##    ..@ format.spss  : chr "F1.0"
##    ..@ display_width: int 9
##    ..@ labels       : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ dfincac : dbl+lbl [1:1760] 3, 3, 1, 2, 4, 2, 2, 3, 4, 2, 4, 2, 4, 2, 2, 4, 2, 1,...
```

```
##    ..@ label      : chr "Large differences in income acceptable to reward talents and efforts"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
##  $ smdfslv : dbl+lbl [1:1760] 2, 2, 4, 2, 4, 4, 2, 2, 2, 3, 3, 2, 2, 3, 2, 2, 3, 4,...
##    ..@ label      : chr "For fair society, differences in standard of living should be small"
##    ..@ format.spss: chr "F1.0"
##    ..@ labels     : Named num [1:8] 1 2 3 4 5 7 8 9
##    .. ..- attr(*, "names")= chr [1:8] "Agree strongly" "Agree" "Neither agree nor disagree" "Disagree
```

```
View(ess_df)
head(ess_df)
```

```
## # A tibble: 6 x 21
##    gvslvol gvslvue  gvhlthc gvcldcr gvjbevn gvpdlwk sbstrec sbbsntx sbprvpv
##   <dbl+lb> <dbl+l> <dbl+lb> <dbl+l> <dbl+l> <dbl+l> <dbl+l> <dbl+l> <dbl+l>
## 1  8 [8]     7 [7]  8 [8]     5 [5]   8 [8]   5 [5] 2 [Agr~ 1 [Agr~ 1 [Agr~
## 2  7 [7]     7 [7]  8 [8]     7 [7]   7 [7]   6 [6] 4 [Dis~ 3 [Nei~ 2 [Agr~
## 3  6 [6]     3 [3]  6 [6]     5 [5]   3 [3]   4 [4] 2 [Agr~ 2 [Agr~ 3 [Nei~
## 4  6 [6]     6 [6]  6 [6]     6 [6]   3 [3]   3 [3] 3 [Nei~ 2 [Agr~ 2 [Agr~
## 5  6 [6]     4 [4]  7 [7]     5 [5]   6 [6]   5 [5] 4 [Dis~ 1 [Agr~ 2 [Agr~
## 6 10 [Ent~   5 [5] 10 [Ent~   5 [5]   5 [5]   7 [7] 3 [Nei~ 2 [Agr~ 2 [Agr~
## # ... with 12 more variables: sbeqsoc <dbl+lbl>, sbcwkfm <dbl+lbl>,
## #   sblazy <dbl+lbl>, sblwcoa <dbl+lbl>, sblwlka <dbl+lbl>, agea <dbl+lbl>,
## #   eduyrs <dbl+lbl>, gndr <dbl+lbl>, hinctnta <dbl+lbl>, gincdif <dbl+lbl>,
## #   dfincac <dbl+lbl>, smdfslv <dbl+lbl>
```

```
# number of subjects
nrow(ess_df)
```

```
## [1] 1760
```

```
# number of variables
ncol(ess_df)
```

```
## [1] 21
```

```
# names of variables
names(ess_df)
```

```
##  [1] "gvslvol"  "gvslvue"  "gvhlthc"  "gvcldcr"  "gvjbevn"  "gvpdlwk"
##  [7] "sbstrec"  "sbbsntx"  "sbprvpv"  "sbeqsoc"  "sbcwkfm"  "sblazy"
## [13] "sblwcoa"  "sblwlka"  "agea"     "eduyrs"   "gndr"     "hinctnta"
## [19] "gincdif"  "dfincac"  "smdfslv"
```

```
# In this first lab, we are exploring two concepts:
# welfare support and welfare criticism. Let's take a closer look at our items

# Select only variables of interest
ess_df_selected <- ess_df %>% select(
  ## Welfare support items ##
  gvslvol, # the old
  gvslvue, # the unemployed
  gvhlthc, # the sick
  gvcldcr, # working parents
  gvjbevn, # job for everyone
  gvpdlwk, # paid sick leave
  ##    Economic criticism items ##
```

```
  sbstrec, # strain on economy
  sbbsntx, # too much taxes
  ##    Social criticism items ##
  sbprvpv, # poverty
  sbeqsoc, # more equal society
  sbcwkfm, # work and family
  ##    Moral criticism items ##
  sblazy,  # people lazy
  sblwcoa, # care for others
  sblwlka  # look after others
)

# Descriptives
descriptive_ess <- as.data.frame(psych::describe(ess_df_selected))
(descriptive_ess <- dplyr::select(descriptive_ess,
                                  n,
                                  mean,
                                  sd,
                                  median,
                                  min,
                                  max,
                                  skew,
                                  kurtosis))
```

```
##            n     mean        sd median min max        skew    kurtosis
## gvslvol 1759 7.871518 1.4811986      8   0  10 -0.78122430  1.37621274
## gvslvue 1753 6.059897 1.9176408      6   0  10 -0.40989634  0.40781515
## gvhlthc 1757 8.030734 1.4715101      8   0  10 -0.94788987  1.81361522
## gvcldcr 1748 7.276316 1.7622804      7   0  10 -0.80981813  1.34667552
## gvjbevn 1756 6.234624 2.2667339      7   0  10 -0.48699173 -0.08302998
## gvpdlwk 1753 7.310325 1.7677965      8   0  10 -0.82684920  1.31394820
## sbstrec 1735 2.963112 1.0193172      3   1   5  0.10310828 -0.92138250
## sbbsntx 1714 2.531505 0.9970179      2   1   5  0.42532526 -0.51782206
## sbprvpv 1740 2.333908 0.8722280      2   1   5  0.85304303  0.41061715
## sbeqsoc 1748 2.374714 0.8341462      2   1   5  0.94680277  0.68051829
## sbcwkfm 1735 2.334870 0.7775840      2   1   5  0.98878599  0.95302935
## sblazy  1751 2.894917 1.0557772      3   1   5  0.10529513 -0.92067158
## sblwcoa 1751 2.919475 1.0352766      3   1   5  0.06846687 -1.05077060
## sblwlka 1746 2.981672 1.0339269      3   1   5 -0.09401127 -1.07498593
```

```
# Calculate variance-covariance matrix
# Welfare support items only
ess_df_welfare_supp <- ess_df %>% select(
  ## Welfare support items ##
  gvslvol, # the old
  gvslvue, # the unemployed
  gvhlthc, # the sick
  gvcldcr, # working parents
  gvjbevn, # job for everyone
  gvpdlwk  # paid sick leave
)
# Sample implied covariance matrix
(welfare_supp_cov <- cov(ess_df_welfare_supp,          # data frame
                         use = "pairwise.complete.obs" # remove NAs
```

```
))
```

```
##           gvslvol   gvslvue   gvhlthc   gvcldcr  gvjbevn   gvpdlwk
## gvslvol 2.1939494 0.8998156 1.3524399 1.0333956 1.203299 1.0712067
## gvslvue 0.8998156 3.6773463 0.8016763 0.7827062 1.488233 0.8159548
## gvhlthc 1.3524399 0.8016763 2.1653419 0.8897580 1.287510 0.9485565
## gvcldcr 1.0333956 0.7827062 0.8897580 3.1056322 1.231219 1.6873857
## gvjbevn 1.2032994 1.4882330 1.2875099 1.2312188 5.138083 1.1656366
## gvpdlwk 1.0712067 0.8159548 0.9485565 1.6873857 1.165637 3.1251045
```

```
# Visualize
(welfare_supp_cor <- cov2cor(welfare_supp_cov))
```

```
##           gvslvol   gvslvue   gvhlthc   gvcldcr   gvjbevn   gvpdlwk
## gvslvol 1.0000000 0.3167911 0.6204995 0.3958934 0.3583933 0.4090983
## gvslvue 0.3167911 1.0000000 0.2840982 0.2316096 0.3423759 0.2406947
## gvhlthc 0.6204995 0.2840982 1.0000000 0.3431102 0.3859995 0.3646428
## gvcldcr 0.3958934 0.2316096 0.3431102 1.0000000 0.3082192 0.5416354
## gvjbevn 0.3583933 0.3423759 0.3859995 0.3082192 1.0000000 0.2908911
## gvpdlwk 0.4090983 0.2406947 0.3646428 0.5416354 0.2908911 1.0000000
```

```
corrplot::corrplot(welfare_supp_cor,
                   is.corr = FALSE,       # whether is a correlation matrix
                   method = "circle",     # magnitude of covariances as circles
                   type = "upper",        # remove the bottom of the covariance matrix
                   addCoef.col = "black"  # add to the plot the coefficients
)
```