

Structural equations modeling

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Data

Write a report on the analysis (10 pages not including appendices & references)

- Theoretical framing of the research problem / Research questions / Hypotheses
- Short description of the dataset used
- Modeling strategy
- Results

```
round <- c(8,9)
countries <- c("Austria","Belgium","Czechia","Estonia","France","Germany",
               "Ireland","Italy","Netherlands","Norway","Poland","Slovenia","Switzerland","United Kingdom",
               "#Hungary", "Finland")
ds_filtradaAll <- ds %>% filter(cntry %in% countries & essround %in% round)
ds_filtradaAll <- copy_labels(ds_filtradaAll, ds)

table(as_character(ds_filtradaAll$cntry),ds_filtradaAll$essround)
```

```
##
##              8      9
## Austria      2010 2499
## Belgium      1766 1767
## Czechia      2269 2398
## Estonia      2019 1904
## France       2070 2010
## Germany      2852 2358
## Ireland      2757 2216
## Italy         2626 2745
## Netherlands  1681 1673
## Norway       1545 1406
## Poland       1694 1500
## Slovenia     1307 1318
## Switzerland  1525 1542
## United Kingdom 1959 2204
```

```
by(ds_filtradaAll, ds_filtradaAll$essround,function(x) describeFast(x))
```

```
## ds_filtradaAll$essround: 8
##
## Number of observations = 28080 of which 9340 are complete cases. Number of variables = 37 o
##
## To list the items and their counts, print with short = FALSE-----
## ds_filtradaAll$essround: 9
##
## Number of observations = 27540 of which 8851 are complete cases. Number of variables = 37 o
##
## To list the items and their counts, print with short = FALSE
```

```

dat2 <- data.frame(reverse.code(keys = rep(-1,5), items = ds_filtradaAll[,items_o], mini = rep(1,5), ma
colnames(dat2) <- paste(items_o,"_r",sep = "")
labels = num_lab("
  1 Not like me at all
  2 Not like me
  3 A little like me
  4 Somewhat like me
  5 Like me
  6 Very much like me
")
val_lab(dat2$iphlpp1_r) <- labels
val_lab(dat2$iplylfr_r) <- labels
val_lab(dat2$ipeqopt_r) <- labels
val_lab(dat2$ipudrst_r) <- labels
val_lab(dat2$impenv_r) <- labels
var_lab(dat2$iphlpp1_r) <- var_lab(ds_filtradaAll$iphlpp1)
var_lab(dat2$iplylfr_r) <- var_lab(ds_filtradaAll$iplylfr)
var_lab(dat2$ipeqopt_r) <- var_lab(ds_filtradaAll$ipeqopt)
var_lab(dat2$ipudrst_r) <- var_lab(ds_filtradaAll$ipudrst)
var_lab(dat2$impenv_r) <- var_lab(ds_filtradaAll$impenv)

ds_filtradaAll <- cbind(ds_filtradaAll,dat2)
items <- paste(items_o,"_r",sep = "")
for (j in round){
  for (i in items){
    print(paste(i,": ", var_lab(eval(parse(text=paste("ds_filtradaAll$",i))))))
    print(use_labels(ds_filtradaAll[ds_filtradaAll$essround == j,],
      table(eval(parse(text=paste("ds_filtradaAll$",i))), as.character(ds_filtradaAll$cnt
    print(use_labels(ds_filtradaAll[ds_filtradaAll$essround == j,],
      round(prop.table(table(eval(parse(text=paste("ds_filtradaAll$",i))),as.character(ds
  }
}

```

```
## [1] "iphlpp1_r : Important to help people and care for others well-being"
```

```
##
##          Austria Belgium Czechia Estonia France Germany
## Not like me at all      45      2      57      9      15      10
## Not like me            66     29     202     115     107      73
## A little like me       266     83     783     384     464     182
## Somewhat like me       942    669    1616    1163     778     814
## Like me               1837    1825    1428    1699    1424    2496
## Very much like me     1308     914     521     539    1257    1586
## <NA>                   45      11      60      14      35      49
##
##          Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all      16     27          3      3      7      6
## Not like me            89     63          32     24     66     21
## A little like me       344    390          84    276    326     46
## Somewhat like me       768   1765          640    550    814    290
## Like me               2144   1999          1779   1338   1399   1472
## Very much like me     1578   1000          793    737    510    766
## <NA>                   34    127          23     23     72     24
##
##          Switzerland United Kingdom
```

```

## Not like me at all      4      5
## Not like me            21     39
## A little like me       77    218
## Somewhat like me      463    567
## Like me               1452   1844
## Very much like me     1026   1455
## <NA>                   24     35
##
## Austria Belgium Czechia Estonia France Germany
## Not like me at all    21.53  0.96  27.27  4.31  7.18  4.78
## Not like me           6.97  3.06  21.33  12.14 11.30  7.71
## A little like me      6.78  2.12  19.96  9.79 11.83  4.64
## Somewhat like me      7.96  5.65  13.65  9.82  6.57  6.88
## Like me               7.61  7.56  5.92  7.04  5.90 10.34
## Very much like me     9.35  6.53  3.72  3.85  8.98 11.34
##
## Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    7.66 12.92      1.44  1.44  3.35  2.87
## Not like me           9.40  6.65      3.38  2.53  6.97  2.22
## A little like me      8.77  9.94      2.14  7.04  8.31  1.17
## Somewhat like me      6.49 14.91      5.41  4.65  6.88  2.45
## Like me               8.88  8.28      7.37  5.54  5.80  6.10
## Very much like me    11.28  7.15      5.67  5.27  3.65  5.48
##
## Switzerland United Kingdom
## Not like me at all    1.91      2.39
## Not like me           2.22      4.12
## A little like me      1.96      5.56
## Somewhat like me      3.91      4.79
## Like me               6.02      7.64
## Very much like me     7.33     10.40
## [1] "iplylfr_r : Important to be loyal to friends and devote to people close"
##
## Austria Belgium Czechia Estonia France Germany
## Not like me at all    26      1     24     11     17     10
## Not like me           37     13     88     44     44     20
## A little like me      179     37    381    146    224     50
## Somewhat like me      445    313   1262    594    566    278
## Like me               1611   1895   1871   2218   1397   2204
## Very much like me     2180   1264    979    897   1800   2598
## <NA>                   31     10     62     13     32     50
##
## Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    20     21      3      1      8      8
## Not like me           87     43      37     12     29     58
## A little like me      341    247      51     95    167     92
## Somewhat like me      726   1389     434    253    483    366
## Like me               2196   2282    1927   1447   1514   1383
## Very much like me     1564   1273     875   1121    932    688
## <NA>                   39    116      27     22     61     30
##
## Switzerland United Kingdom
## Not like me at all      2      8
## Not like me            15     54

```

```

## A little like me          27          212
## Somewhat like me         204          473
## Like me                  1331         1912
## Very much like me        1461         1464
## <NA>                      27           40
##
## Austria Belgium Czechia Estonia France Germany
## Not like me at all    16.25    0.62    15.00    6.88    10.62    6.25
## Not like me           6.37    2.24    15.15    7.57    7.57    3.44
## A little like me      7.96    1.65    16.94    6.49    9.96    2.22
## Somewhat like me      5.72    4.02    16.21    7.63    7.27    3.57
## Like me               6.40    7.52    7.43    8.81    5.55    8.75
## Very much like me     11.42    6.62    5.13    4.70    9.43    13.60
##
## Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    12.50 13.12          1.88    0.62    5.00    5.00
## Not like me           14.97 7.40          6.37    2.07    4.99    9.98
## A little like me      15.16 10.98          2.27    4.22    7.43    4.09
## Somewhat like me      9.32 17.84          5.57    3.25    6.20    4.70
## Like me               8.72 9.06          7.65    5.74    6.01    5.49
## Very much like me     8.19 6.67          4.58    5.87    4.88    3.60
##
## Switzerland United Kingdom
## Not like me at all    1.25          5.00
## Not like me           2.58          9.29
## A little like me      1.20          9.43
## Somewhat like me      2.62          6.08
## Like me               5.28          7.59
## Very much like me     7.65          7.67
## [1] "ipeqopt_r : Important that people are treated equally and have equal opportunities"
##
## Austria Belgium Czechia Estonia France Germany
## Not like me at all    47      8      53      51      18      48
## Not like me           86     54     212     329     71     194
## A little like me      296    117    568    420    271    240
## Somewhat like me      902    699   1362   1059    644    750
## Like me               1800   1680   1627   1627   1215   2340
## Very much like me     1333    957    751    422   1825   1581
## <NA>                  45     18     94     15     36     57
##
## Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    34     31          11     12     20      8
## Not like me           129    112          65    104     80     54
## A little like me      438    402          77    292    223     48
## Somewhat like me      854   1727          501    437    575    222
## Like me               1937   1834          1871   1318   1425   1325
## Very much like me     1542   1121          805    763    809    940
## <NA>                  39    144          24     25     62     28
##
## Switzerland United Kingdom
## Not like me at all    21          28
## Not like me           102          139
## A little like me      178          326
## Somewhat like me      426          663

```

```

## Like me 1342 1661
## Very much like me 962 1304
## <NA> 36 42
##
## Austria Belgium Czechia Estonia France Germany
## Not like me at all 12.05 2.05 13.59 13.08 4.62 12.31
## Not like me 4.97 3.12 12.25 19.01 4.10 11.21
## A little like me 7.60 3.00 14.58 10.78 6.96 6.16
## Somewhat like me 8.34 6.46 12.59 9.79 5.95 6.93
## Like me 7.83 7.30 7.07 7.07 5.28 10.17
## Very much like me 8.82 6.33 4.97 2.79 12.07 10.46
##
## Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all 8.72 7.95 2.82 3.08 5.13 2.05
## Not like me 7.45 6.47 3.76 6.01 4.62 3.12
## A little like me 11.24 10.32 1.98 7.49 5.72 1.23
## Somewhat like me 7.89 15.96 4.63 4.04 5.31 2.05
## Like me 8.42 7.97 8.13 5.73 6.20 5.76
## Very much like me 10.20 7.42 5.33 5.05 5.35 6.22
##
## Switzerland United Kingdom
## Not like me at all 5.38 7.18
## Not like me 5.89 8.03
## A little like me 4.57 8.37
## Somewhat like me 3.94 6.13
## Like me 5.83 7.22
## Very much like me 6.36 8.63
## [1] "ipudrst_r : Important to understand different people"
##
## Austria Belgium Czechia Estonia France Germany
## Not like me at all 63 9 96 15 37 18
## Not like me 129 72 296 137 142 108
## A little like me 360 170 815 343 482 223
## Somewhat like me 1168 852 1628 956 823 787
## Like me 1728 1811 1357 1899 1412 2707
## Very much like me 1011 602 384 560 1150 1310
## <NA> 50 17 91 13 34 57
##
## Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all 33 37 11 4 19 8
## Not like me 177 126 104 63 122 81
## A little like me 530 583 178 319 382 116
## Somewhat like me 940 1857 779 594 698 375
## Like me 2166 1818 1765 1436 1427 1525
## Very much like me 1088 770 489 512 461 495
## <NA> 39 180 28 23 85 25
##
## Switzerland United Kingdom
## Not like me at all 7 26
## Not like me 55 126
## A little like me 120 364
## Somewhat like me 535 716
## Like me 1550 1945
## Very much like me 768 944

```

```

##      <NA>                32                42
##
##      Austria Belgium Czechia Estonia France Germany
## Not like me at all    16.45    2.35    25.07    3.92    9.66    4.70
## Not like me          7.42    4.14    17.03    7.88    8.17    6.21
## A little like me     7.22    3.41    16.35    6.88    9.67    4.47
## Somewhat like me     9.19    6.70    12.81    7.52    6.48    6.19
## Like me              7.04    7.38    5.53    7.74    5.75    11.03
## Very much like me    9.59    5.71    3.64    5.31    10.91    12.42
##
##      Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    8.62  9.66         2.87  1.04  4.96    2.09
## Not like me          10.18  7.25         5.98  3.62  7.02    4.66
## A little like me     10.63 11.70         3.57  6.40  7.66    2.33
## Somewhat like me     7.40 14.61         6.13  4.67  5.49    2.95
## Like me              8.82  7.41         7.19  5.85  5.81    6.21
## Very much like me    10.32  7.30         4.64  4.86  4.37    4.69
##
##      Switzerland United Kingdom
## Not like me at all    1.83         6.79
## Not like me          3.16         7.25
## A little like me     2.41         7.30
## Somewhat like me     4.21         5.63
## Like me              6.31         7.92
## Very much like me    7.28         8.95
## [1] "impenv_r : Important to care for nature and environment"
##
##      Austria Belgium Czechia Estonia France Germany
## Not like me at all    34    10    27    5    33    16
## Not like me          66    29   132    52   157   113
## A little like me     253   158   432   180   491   274
## Somewhat like me     757   717  1200   667   648   856
## Like me             1636  1698  1638   1808  1275  2206
## Very much like me    1732   910  1173   1198  1442  1697
## <NA>                31    11    65    13    34    48
##
##      Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    35    14         16    13    7    3
## Not like me          131    51         68   132   55   25
## A little like me     423   282         163   381  187   51
## Somewhat like me     897  1223         730   631  569  231
## Like me             1825  1921        1609  1207  1390  1198
## Very much like me    1628  1759         745   563   928  1099
## <NA>                34   121         23    24   58   18
##
##      Switzerland United Kingdom
## Not like me at all    4         18
## Not like me          33        134
## A little like me     120        350
## Somewhat like me     460        713
## Like me             1269       1588
## Very much like me    1156       1322
## <NA>                25         38
##

```

```

##          Austria Belgium Czechia Estonia France Germany
## Not like me at all  14.47   4.26   11.49   2.13  14.04   6.81
## Not like me         5.60   2.46   11.21   4.41  13.33   9.59
## A little like me    6.76   4.22   11.54   4.81  13.11   7.32
## Somewhat like me    7.35   6.96   11.65   6.48   6.29   8.31
## Like me             7.35   7.63   7.36   8.12   5.73   9.91
## Very much like me   9.98   5.24   6.76   6.90   8.31   9.78
##
##          Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all  14.89  5.96         6.81  5.53  2.98   1.28
## Not like me        11.12  4.33         5.77  11.21  4.67   2.12
## A little like me    11.30  7.53         4.35  10.17  4.99   1.36
## Somewhat like me    8.71 11.87         7.09  6.13  5.52   2.24
## Like me             8.20  8.63         7.23  5.42  6.24   5.38
## Very much like me   9.38 10.14         4.29  3.24  5.35   6.33
##
##          Switzerland United Kingdom
## Not like me at all    1.70         7.66
## Not like me          2.80        11.38
## A little like me      3.20         9.35
## Somewhat like me      4.47         6.92
## Like me              5.70         7.13
## Very much like me     6.66         7.62
## [1] "iphlppl_r : Important to help people and care for others well-being"
##
##          Austria Belgium Czechia Estonia France Germany
## Not like me at all    45     2     57     9    15     10
## Not like me          66    29    202    115   107     73
## A little like me     266    83    783    384   464    182
## Somewhat like me     942   669   1616   1163   778    814
## Like me             1837   1825   1428   1699   1424   2496
## Very much like me    1308    914    521    539   1257   1586
## <NA>                45     11     60     14     35     49
##
##          Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    16    27         3     3     7     6
## Not like me          89    63         32    24    66    21
## A little like me     344   390         84   276   326    46
## Somewhat like me     768  1765         640   550   814   290
## Like me             2144  1999        1779  1338  1399   1472
## Very much like me    1578  1000         793   737   510   766
## <NA>                34   127         23    23    72    24
##
##          Switzerland United Kingdom
## Not like me at all     4         5
## Not like me          21         39
## A little like me      77        218
## Somewhat like me     463        567
## Like me             1452       1844
## Very much like me    1026       1455
## <NA>                24         35
##
##          Austria Belgium Czechia Estonia France Germany
## Not like me at all   21.53    0.96   27.27    4.31    7.18    4.78

```

```

## Not like me      6.97    3.06    21.33    12.14    11.30    7.71
## A little like me  6.78    2.12    19.96    9.79    11.83    4.64
## Somewhat like me  7.96    5.65    13.65    9.82    6.57    6.88
## Like me          7.61    7.56    5.92    7.04    5.90    10.34
## Very much like me 9.35    6.53    3.72    3.85    8.98    11.34
##
##
##      Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all  7.66 12.92      1.44  1.44  3.35  2.87
## Not like me        9.40 6.65      3.38  2.53  6.97  2.22
## A little like me    8.77 9.94      2.14  7.04  8.31  1.17
## Somewhat like me    6.49 14.91     5.41  4.65  6.88  2.45
## Like me            8.88 8.28      7.37  5.54  5.80  6.10
## Very much like me   11.28 7.15     5.67  5.27  3.65  5.48
##
##
##      Switzerland United Kingdom
## Not like me at all  1.91      2.39
## Not like me        2.22      4.12
## A little like me    1.96      5.56
## Somewhat like me    3.91      4.79
## Like me            6.02      7.64
## Very much like me    7.33     10.40
## [1] "iplylfr_r : Important to be loyal to friends and devote to people close"
##
##
##      Austria Belgium Czechia Estonia France Germany
## Not like me at all  26      1      24      11      17      10
## Not like me        37     13     88     44     44     20
## A little like me   179     37    381    146    224     50
## Somewhat like me   445    313   1262    594    566    278
## Like me           1611   1895   1871   2218   1397   2204
## Very much like me  2180   1264    979    897   1800   2598
## <NA>              31     10     62     13     32     50
##
##
##      Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all  20     21      3      1      8      8
## Not like me        87     43     37     12     29     58
## A little like me   341    247     51     95    167     92
## Somewhat like me   726   1389    434    253    483    366
## Like me           2196   2282   1927   1447   1514   1383
## Very much like me  1564   1273    875   1121    932    688
## <NA>              39    116     27     22     61     30
##
##
##      Switzerland United Kingdom
## Not like me at all  2      8
## Not like me        15     54
## A little like me    27    212
## Somewhat like me    204   473
## Like me           1331   1912
## Very much like me   1461   1464
## <NA>              27     40
##
##
##      Austria Belgium Czechia Estonia France Germany
## Not like me at all  16.25  0.62   15.00   6.88  10.62   6.25
## Not like me        6.37  2.24   15.15   7.57   7.57   3.44
## A little like me    7.96  1.65   16.94   6.49   9.96   2.22

```



```

## Somewhat like me      5.72    4.02    16.21    7.63    7.27    3.57
## Like me                6.40    7.52    7.43    8.81    5.55    8.75
## Very much like me     11.42    6.62    5.13    4.70    9.43    13.60
##
##
##      Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all    12.50 13.12         1.88  0.62  5.00    5.00
## Not like me           14.97  7.40         6.37  2.07  4.99    9.98
## A little like me      15.16 10.98         2.27  4.22  7.43    4.09
## Somewhat like me       9.32 17.84         5.57  3.25  6.20    4.70
## Like me                8.72  9.06         7.65  5.74  6.01    5.49
## Very much like me      8.19  6.67         4.58  5.87  4.88    3.60
##
##
##      Switzerland United Kingdom
## Not like me at all         1.25         5.00
## Not like me                2.58         9.29
## A little like me           1.20         9.43
## Somewhat like me           2.62         6.08
## Like me                    5.28         7.59
## Very much like me          7.65         7.67
## [1] "ipeqopt_r : Important that people are treated equally and have equal opportunities"
##
##
##      Austria Belgium Czechia Estonia France Germany
## Not like me at all        47         8         53         51         18         48
## Not like me               86        54        212        329         71        194
## A little like me          296       117       568       420       271       240
## Somewhat like me          902       699      1362      1059       644       750
## Like me                   1800      1680      1627      1627      1215      2340
## Very much like me        1333       957       751       422      1825      1581
## <NA>                       45        18        94        15        36        57
##
##
##      Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all        34        31         11         12         20         8
## Not like me              129       112         65        104         80        54
## A little like me          438       402         77        292        223        48
## Somewhat like me          854      1727         501        437        575       222
## Like me                   1937      1834        1871       1318       1425      1325
## Very much like me        1542      1121         805        763        809       940
## <NA>                       39       144         24         25         62        28
##
##
##      Switzerland United Kingdom
## Not like me at all         21         28
## Not like me              102        139
## A little like me          178        326
## Somewhat like me          426        663
## Like me                   1342       1661
## Very much like me         962       1304
## <NA>                       36         42
##
##
##      Austria Belgium Czechia Estonia France Germany
## Not like me at all      12.05     2.05    13.59    13.08     4.62    12.31
## Not like me              4.97     3.12    12.25    19.01     4.10    11.21
## A little like me         7.60     3.00    14.58    10.78     6.96     6.16
## Somewhat like me         8.34     6.46    12.59     9.79     5.95     6.93
## Like me                   7.83     7.30     7.07     7.07     5.28    10.17

```

```

##      Very much like me      8.82      6.33      4.97      2.79 12.07      10.46
##
##
##      Ireland Italy Netherlands Norway Poland Slovenia
##      Not like me at all      8.72  7.95      2.82  3.08  5.13      2.05
##      Not like me      7.45  6.47      3.76  6.01  4.62      3.12
##      A little like me      11.24 10.32      1.98  7.49  5.72      1.23
##      Somewhat like me      7.89 15.96      4.63  4.04  5.31      2.05
##      Like me      8.42  7.97      8.13  5.73  6.20      5.76
##      Very much like me      10.20 7.42      5.33  5.05  5.35      6.22
##
##
##      Switzerland United Kingdom
##      Not like me at all      5.38      7.18
##      Not like me      5.89      8.03
##      A little like me      4.57      8.37
##      Somewhat like me      3.94      6.13
##      Like me      5.83      7.22
##      Very much like me      6.36      8.63
## [1] "ipudrst_r : Important to understand different people"
##
##
##      Austria Belgium Czechia Estonia France Germany
##      Not like me at all      63      9      96      15      37      18
##      Not like me      129      72      296      137      142      108
##      A little like me      360      170      815      343      482      223
##      Somewhat like me      1168      852      1628      956      823      787
##      Like me      1728      1811      1357      1899      1412      2707
##      Very much like me      1011      602      384      560      1150      1310
##      <NA>      50      17      91      13      34      57
##
##
##      Ireland Italy Netherlands Norway Poland Slovenia
##      Not like me at all      33      37      11      4      19      8
##      Not like me      177      126      104      63      122      81
##      A little like me      530      583      178      319      382      116
##      Somewhat like me      940      1857      779      594      698      375
##      Like me      2166      1818      1765      1436      1427      1525
##      Very much like me      1088      770      489      512      461      495
##      <NA>      39      180      28      23      85      25
##
##
##      Switzerland United Kingdom
##      Not like me at all      7      26
##      Not like me      55      126
##      A little like me      120      364
##      Somewhat like me      535      716
##      Like me      1550      1945
##      Very much like me      768      944
##      <NA>      32      42
##
##
##      Austria Belgium Czechia Estonia France Germany
##      Not like me at all      16.45      2.35      25.07      3.92      9.66      4.70
##      Not like me      7.42      4.14      17.03      7.88      8.17      6.21
##      A little like me      7.22      3.41      16.35      6.88      9.67      4.47
##      Somewhat like me      9.19      6.70      12.81      7.52      6.48      6.19
##      Like me      7.04      7.38      5.53      7.74      5.75      11.03
##      Very much like me      9.59      5.71      3.64      5.31      10.91      12.42
##

```

```

##          Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all      8.62  9.66          2.87  1.04  4.96    2.09
## Not like me            10.18  7.25          5.98  3.62  7.02    4.66
## A little like me       10.63 11.70          3.57  6.40  7.66    2.33
## Somewhat like me       7.40 14.61          6.13  4.67  5.49    2.95
## Like me                8.82  7.41          7.19  5.85  5.81    6.21
## Very much like me     10.32  7.30          4.64  4.86  4.37    4.69
##
##          Switzerland United Kingdom
## Not like me at all      1.83          6.79
## Not like me            3.16          7.25
## A little like me       2.41          7.30
## Somewhat like me       4.21          5.63
## Like me                6.31          7.92
## Very much like me      7.28          8.95
## [1] "impenv_r : Important to care for nature and environment"
##
##          Austria Belgium Czechia Estonia France Germany
## Not like me at all      34      10      27      5      33      16
## Not like me            66      29     132      52     157     113
## A little like me       253     158     432     180     491     274
## Somewhat like me       757     717    1200     667     648     856
## Like me               1636    1698    1638    1808    1275    2206
## Very much like me     1732     910    1173    1198    1442    1697
## <NA>                  31      11      65      13      34      48
##
##          Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all      35      14          16      13      7      3
## Not like me            131      51          68     132     55     25
## A little like me       423     282          163     381     187     51
## Somewhat like me       897    1223          730     631     569     231
## Like me               1825    1921          1609    1207    1390    1198
## Very much like me     1628    1759          745     563     928    1099
## <NA>                  34     121          23      24     58     18
##
##          Switzerland United Kingdom
## Not like me at all      4          18
## Not like me            33          134
## A little like me       120          350
## Somewhat like me       460          713
## Like me               1269          1588
## Very much like me     1156          1322
## <NA>                  25          38
##
##          Austria Belgium Czechia Estonia France Germany
## Not like me at all     14.47    4.26    11.49    2.13   14.04    6.81
## Not like me            5.60    2.46    11.21    4.41   13.33    9.59
## A little like me       6.76    4.22    11.54    4.81   13.11    7.32
## Somewhat like me       7.35    6.96    11.65    6.48    6.29    8.31
## Like me               7.35    7.63    7.36    8.12    5.73    9.91
## Very much like me     9.98    5.24    6.76    6.90    8.31    9.78
##
##          Ireland Italy Netherlands Norway Poland Slovenia
## Not like me at all     14.89    5.96          6.81    5.53    2.98    1.28

```

```
## Not like me 11.12 4.33 5.77 11.21 4.67 2.12
## A little like me 11.30 7.53 4.35 10.17 4.99 1.36
## Somewhat like me 8.71 11.87 7.09 6.13 5.52 2.24
## Like me 8.20 8.63 7.23 5.42 6.24 5.38
## Very much like me 9.38 10.14 4.29 3.24 5.35 6.33
```

```
##
## Switzerland United Kingdom
## Not like me at all 1.70 7.66
## Not like me 2.80 11.38
## A little like me 3.20 9.35
## Somewhat like me 4.47 6.92
## Like me 5.70 7.13
## Very much like me 6.66 7.62
```

```
#Assign weight and survey structure for ESS data
ds_filtradaAll %>% group_by(essround,cntry) %>%
  summarise(pesos=round(sum(dweight),0), n=n(), diff=n-pesos) %>%
  summarise(Diff_Pesos_N=sum(diff))
```

```
## # A tibble: 2 x 2
##   essround Diff_Pesos_N
##   <labelled> <dbl>
## 1 8 0
## 2 9 0
```

```
ds_filtradaAll$gnrD <- ifelse(ds_filtradaAll$gnr == 1, 0,
                             ifelse(ds_filtradaAll$gnr == 2, 1, ds_filtradaAll$gnr))
var_lab(ds_filtradaAll$gnrD) <- "Gender (Female)"
use_labels(ds_filtradaAll, table(gnrD, as.character(cntry)))
```

```
##
## Gender (Female) Austria Belgium Czechia Estonia France Germany Ireland
## 0 2054 1755 2146 1762 1866 2720 2407
## 1 2455 1778 2521 2161 2214 2490 2566
```

```
##
## Gender (Female) Italy Netherlands Norway Poland Slovenia Switzerland
## 0 2581 1585 1607 1517 1208 1563
## 1 2790 1769 1344 1675 1417 1504
```

```
##
## Gender (Female) United Kingdom
## 0 1870
## 1 2293
```

```
# use_labels(ds_filtradaAll, table(marsts, as.character(cntry)))
# marstsD <- as.dichotomy(ds_filtradaAll$marsts, prefix="marsts")
# names(marstsD)
```

```
val_lab(ds_filtradaAll$eiscd)
```

```
## Not possible to harmonise into ES-ISCED
## 0
## ES-ISCED I , less than lower secondary
## 1
## ES-ISCED II, lower secondary
## 2
## ES-ISCED IIIb, lower tier upper secondary
```

```

##                                     3
##      ES-ISCED IIIa, upper tier upper secondary
##                                     4
##      ES-ISCED IV, advanced vocational, sub-degree
##                                     5
##      ES-ISCED V1, lower tertiary education, BA level
##                                     6
##      ES-ISCED V2, higher tertiary education, >= MA level
##                                     7
##                                     Other
##                                     55
##                                     Refusal
##                                     77
##                                     Don't know
##                                     88
##                                     No answer
##                                     99

ds_filtradaAll$eiscedT <- ifelse(ds_filtradaAll$eisced %in% c(1,2,3) , 1,
                                ifelse(ds_filtradaAll$eisced %in% c(4,5),2,
                                         ifelse(ds_filtradaAll$eisced %in% c(6,7), 3,NA)))
val_lab(ds_filtradaAll$eiscedT) = num_lab("
  1 Less than Upper secondary
  2 Upper secondary or vocational
  3 Bachelor or higher
")
var_lab(ds_filtradaAll$eiscedT) <- var_lab(ds_filtradaAll$eisced)
use_labels(ds_filtradaAll,table(eiscedT,as.character(cntry)))

##
## Highest level of education, ES - ISCED eiscedT Austria Belgium Czechia
##      Less than Upper secondary      3097      1192      1952
##      Upper secondary or vocational    807      1086      2022
##      Bachelor or higher              594      1233      688
##
## Highest level of education, ES - ISCED eiscedT Estonia France Germany
##      Less than Upper secondary      805      2006      2551
##      Upper secondary or vocational  1987      1292      1308
##      Bachelor or higher            1129      776      1324
##
## Highest level of education, ES - ISCED eiscedT Ireland Italy Netherlands
##      Less than Upper secondary      1750      2812      1823
##      Upper secondary or vocational  1886      1832      457
##      Bachelor or higher            1311      677      1053
##
## Highest level of education, ES - ISCED eiscedT Norway Poland Slovenia
##      Less than Upper secondary      1040      1628      1034
##      Upper secondary or vocational   708      825      1061
##      Bachelor or higher            1189      726      522
##
## Highest level of education, ES - ISCED eiscedT Switzerland United Kingdom
##      Less than Upper secondary      1687      1605
##      Upper secondary or vocational   744      1277
##      Bachelor or higher            624      1172

```

```

eiscedD <- as.dichotomy(ds_filtradaAll$eiscedT, prefix="eisced")
names(eiscedD)

## [1] "eisced1" "eisced2" "eisced3"
val_lab(ds_filtradaAll$domicil)

##          A big city Suburbs or outskirts of big city
##              1                      2
##      Town or small city          Country village
##              3                      4
##      Farm or home in countryside          Refusal
##              5                      7
##      Don't know                      No answer
##              8                      9

ds_filtradaAll$domicilT <- ifelse(ds_filtradaAll$domicil %in% c(4,5) , 1,
                                ifelse(ds_filtradaAll$domicil %in% c(3) , 2,
                                        ifelse(ds_filtradaAll$domicil %in% c(2),3,
                                              ifelse(ds_filtradaAll$domicil %in% c(1),4,NA))))

val_lab(ds_filtradaAll$domicilT) <- num_lab("
  1 Countryside
  2 Town or small city
  3 Suburbs or outskirts of big city
  4 A big city
")

var_lab(ds_filtradaAll$domicilT) <- var_lab(ds_filtradaAll$domicil)
use_labels(ds_filtradaAll,table(domicilT,as.character(cntry)))

##
## Domicile, respondent's description domicilT Austria Belgium Czechia
##      Countryside          2054      1790      1436
##      Town or small city    1085      871      1510
##      Suburbs or outskirts of big city    358      310      179
##      A big city          1012      562      1542
##
## Domicile, respondent's description domicilT Estonia France Germany Ireland
##      Countryside          1127      1444      1719      2078
##      Town or small city    1246      1441      1925      1444
##      Suburbs or outskirts of big city    369      512      778      1016
##      A big city          1180      682      787      428
##
## Domicile, respondent's description domicilT Italy Netherlands Norway
##      Countryside          2529          1530      1085
##      Town or small city    1880          879      915
##      Suburbs or outskirts of big city    322          312      494
##      A big city          628          633      452
##
## Domicile, respondent's description domicilT Poland Slovenia Switzerland
##      Countryside          1426      1441          1714
##      Town or small city    1021      573          851
##      Suburbs or outskirts of big city    85      289          243
##      A big city          655      318          259
##

```

```
## Domicile, respondent's description domicilT United Kingdom
##          Countryside                      1076
##          Town or small city                1893
##          Suburbs or outskirts of big city   817
##          A big city                        373

domicilD <- as.dichotomy(ds_filtradaAll$domicilT, prefix="domicil")
names(domicilD)

## [1] "domicil1" "domicil2" "domicil3" "domicil4"

# use_labels(ds_filtradaAll, table(chldhhe, as.character(cntry)))
# ds_filtradaAll$chldhheD <- ifelse(ds_filtradaAll$chldhhe == 2, 0, ds_filtradaAll$chldhhe)
#
# use_labels(ds_filtradaAll, table(lvgptnea, as.character(cntry)))
# ds_filtradaAll$lvgptneaD <- ifelse(ds_filtradaAll$lvgptnea == 2, 0, ds_filtradaAll$lvgptnea)

ds_filtradaAll <- cbind(ds_filtradaAll, eiscedD, domicilD)#, marstsD
ds_filtradaAll <- ds_filtradaAll[, !colnames(ds_filtradaAll) %in% c("eisced55")]
```

Model CFA

```
model1<-'
achie =~ ipshabt + ipsuces
Benev =~ iphlpppl + iplylfr
confo =~ ipfrule + ipbhprp
hedon =~ ipgdtim + impfun
power =~ imprich + iprspot
secur =~ impsafe + ipstrgv
selfd =~ ipcrtiv + impfree
stimu =~ impdiff + ipadvnt
tradi =~ ipmodst + imptrad
Unive =~ ipeqopt + ipudrst + impenv'

for (r in c(8,9)) {
  ds_filtrada <- ds_filtradaAll %>% filter(essround == r)
  survey.design <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada)

  lavaan.fit1 <- lavaan(model1, data=ds_filtrada, auto.fix.first=TRUE,
    auto.var=TRUE, int.ov.free=TRUE,
    auto.cov.lv.x=TRUE, estimator="MLM",
    cluster = "cntry", meanstructure=TRUE)

  survey.fit1 <- lavaan.survey(lavaan.fit=lavaan.fit1, survey.design=survey.design)
  print(paste("ESS round: ", r))
  print(fitMeasures(survey.fit1, c("cfi", "rmsea", "srmr")))
  print(modindices(survey.fit1, sort=T)[1:10,])
}

## [1] "ESS round: 8"
##      cfi rmsea srmr
## 0.902 0.058 0.049
##      lhs op      rhs      mi      epc sepc.lv sepc.all sepc.nox
## 173 confo =~ imprich 2635.432 -0.869 -0.680 -0.527 -0.527
## 289 tradi =~ imprich 2510.648 -0.966 -0.522 -0.405 -0.405
```

```
## 174 confo =~ iprspot 2510.041 0.951 0.743 0.550 0.550
## 290 tradi =~ iprspot 2442.709 1.065 0.575 0.426 0.426
## 232 secur =~ imprich 1908.016 -0.679 -0.562 -0.436 -0.436
## 314 Unive =~ impdiff 1850.133 0.740 0.426 0.319 0.319
## 315 Unive =~ ipadvnt 1832.963 -0.846 -0.487 -0.343 -0.343
## 233 secur =~ iprspot 1822.581 0.742 0.614 0.454 0.454
## 256 selfd =~ ipadvnt 1790.034 -1.182 -0.811 -0.571 -0.571
## 255 selfd =~ impdiff 1763.892 1.020 0.700 0.524 0.524
## [1] "ESS round: 9"
## cfi rmsea srmr
## 0.900 0.058 0.048
## lhs op rhs mi epc sepc.lv sepc.all sepc.nox
## 289 tradi =~ imprich 2455.685 -0.871 -0.468 -0.384 -0.384
## 173 confo =~ imprich 2411.447 -0.834 -0.589 -0.484 -0.484
## 290 tradi =~ iprspot 2247.085 1.023 0.549 0.402 0.402
## 174 confo =~ iprspot 2224.435 0.983 0.694 0.508 0.508
## 232 secur =~ imprich 1779.921 -0.623 -0.499 -0.410 -0.410
## 233 secur =~ iprspot 1763.434 0.752 0.602 0.441 0.441
## 314 Unive =~ impdiff 1356.475 0.691 0.375 0.280 0.280
## 154 Benev =~ imprich 1353.931 -0.550 -0.368 -0.303 -0.303
## 155 Benev =~ iprspot 1348.768 0.671 0.449 0.329 0.329
## 315 Unive =~ ipadvnt 1305.687 -0.781 -0.424 -0.297 -0.297
```

```
model3<-'  
Benev =~ iphlppl_r + iplylfr_r  
Unive =~ ipeqopt_r + ipudrst_r + impenv_r  
Benev ~~ Unive  
'  
for (r in c(8,9)) {  
  ds_filtrada <- ds_filtradaAll %>% filter(essround == r)  
  survey.design <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada)  
  
  lavaan.fit3 <- lavaan(model3, data=ds_filtrada, auto.fix.first=TRUE,  
                        auto.var=TRUE, int.ov.free=TRUE,  
                        auto.cov.lv.x=TRUE, estimator="MLM",  
                        cluster = "cntry", meanstructure=TRUE)  
  survey.fit3 <- lavaan.survey(lavaan.fit=lavaan.fit3,survey.design=survey.design)  
  assign(paste0("survey.fit3r",r),survey.fit3)  
  
  print(paste("ESS round: ", r))  
  print(fitMeasures(survey.fit3, c("cfi", "rmsea", "srmr")))  
  print(modindices(survey.fit3,sort=T)[1:10,])  
  
  cov <- round(cov(ds_filtrada[,items], use="complete.obs"),3)  
  print(lowerMat(cov, digits=3))  
  print(round(colMeans(ds_filtrada[,items], na.rm = TRUE),3))  
  print(fitted(survey.fit3))  
  invisible(semPaths(survey.fit3,"model","stand", style = "lisrel", rainbowStart = 0.8))  
}
```

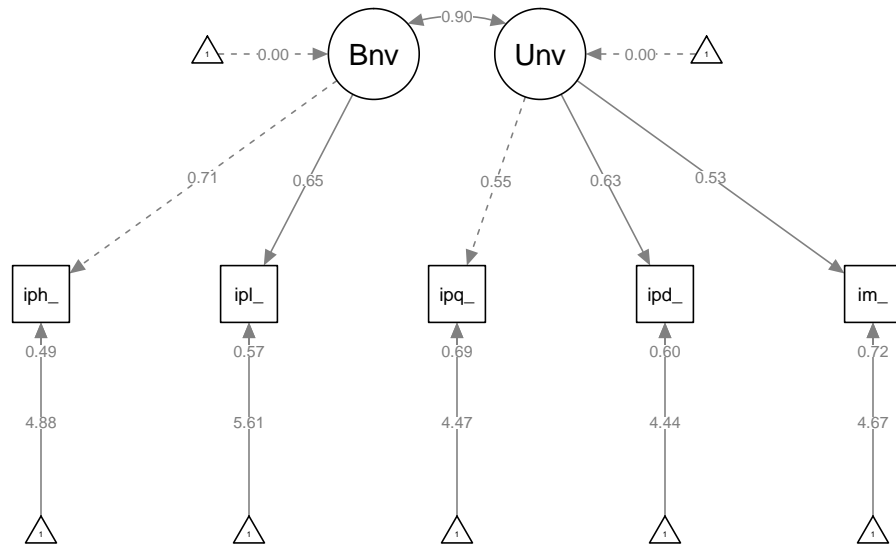
```
## [1] "ESS round: 8"  
## cfi rmsea srmr  
## 0.990 0.047 0.014  
## lhs op rhs mi epc sepc.lv sepc.all sepc.nox  
## 32 iplylfr_r ~~ impenv_r 166.589 0.065 0.065 0.109 0.109
```



```

## 21      Benev =~ ipeqopt_r 130.387 -0.830 -0.583 -0.543 -0.543
## 35 ipudrst_r ~~ impenv_r 130.387 -0.075 -0.075 -0.106 -0.106
## 23      Benev =~ impenv_r 91.091 0.634 0.445 0.431 0.431
## 33 ipeqopt_r ~~ ipudrst_r 91.091 0.068 0.068 0.094 0.094
## 30 iplylfr_r ~~ ipeqopt_r 64.763 -0.043 -0.043 -0.070 -0.070
## 28 iphlppl_r ~~ ipudrst_r 29.456 0.034 0.034 0.060 0.060
## 31 iplylfr_r ~~ ipudrst_r 17.367 -0.023 -0.023 -0.041 -0.041
## 29 iphlppl_r ~~ impenv_r 12.375 -0.020 -0.020 -0.033 -0.033
## 27 iphlppl_r ~~ ipeqopt_r 5.289 -0.014 -0.014 -0.022 -0.022
##          iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.944
## iplylfr_r 0.401 0.791
## ipeqopt_r 0.354 0.276 1.124
## ipudrst_r 0.409 0.329 0.398 1.069
## impenv_r 0.332 0.318 0.321 0.318 1.052
## [1] 0.401 0.354 0.409 0.332 0.276 0.329 0.318 0.398 0.321 0.318
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
##      4.813      5.062      4.806      4.645      4.827
## $cov
##          iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.969
## iplylfr_r 0.413 0.814
## ipeqopt_r 0.375 0.314 1.154
## ipudrst_r 0.415 0.347 0.390 1.091
## impenv_r 0.345 0.289 0.324 0.358 1.069
##
## $mean
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
##      4.808      5.062      4.797      4.642      4.830

```

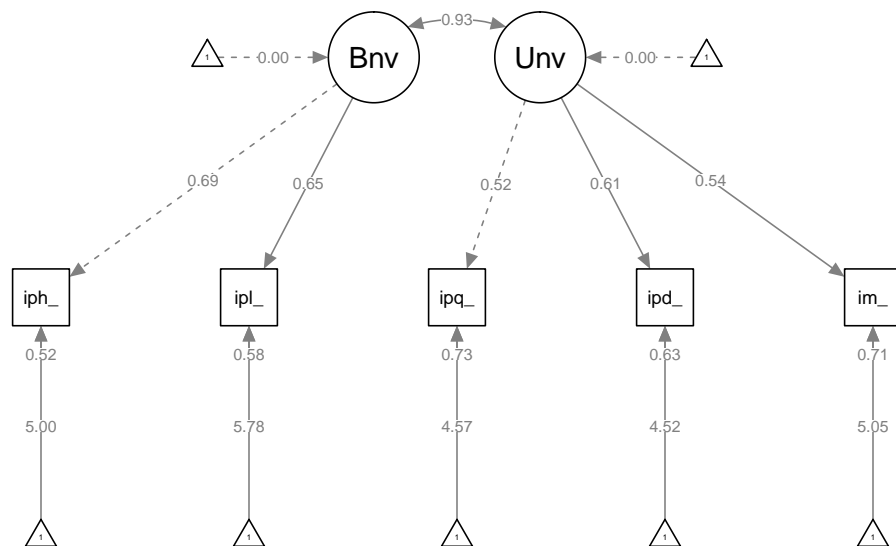


```

## [1] "ESS round: 9"
##   cfi rmsea srmr
## 0.985 0.058 0.017
##           lhs op           rhs           mi      epc sepc.lv sepc.all sepc.nox
## 32 iplylfr_r ~~ impenv_r 343.794 0.093 0.093 0.166 0.166
## 33 ipeqopt_r ~~ ipudrst_r 135.389 0.079 0.079 0.107 0.107
## 23 Benev == impenv_r 135.388 1.202 0.807 0.815 0.815
## 30 iplylfr_r ~~ ipeqopt_r 94.716 -0.051 -0.051 -0.085 -0.085
## 35 ipudrst_r ~~ impenv_r 86.516 -0.061 -0.061 -0.089 -0.089
## 21 Benev == ipeqopt_r 86.515 -0.983 -0.660 -0.625 -0.625
## 31 iplylfr_r ~~ ipudrst_r 72.357 -0.047 -0.047 -0.086 -0.086
## 29 iphlppl_r ~~ impenv_r 58.934 -0.043 -0.043 -0.074 -0.074
## 28 iphlppl_r ~~ ipudrst_r 40.168 0.040 0.040 0.069 0.069
## 22 Benev == ipudrst_r 5.674 -0.304 -0.204 -0.198 -0.198
##           iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.917
## iplylfr_r 0.373 0.763
## ipeqopt_r 0.337 0.257 1.100
## ipudrst_r 0.389 0.306 0.366 1.044
## impenv_r 0.315 0.321 0.280 0.305 0.974
## [1] 0.373 0.337 0.389 0.315 0.257 0.306 0.321 0.366 0.280 0.305
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
## 4.847 5.099 4.821 4.667 4.996
## $cov
##           iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.938

```

```
## iplylfr_r 0.386 0.781
## ipeqopt_r 0.344 0.294 1.116
## ipudrst_r 0.392 0.335 0.347 1.065
## impenv_r 0.334 0.285 0.295 0.337 0.981
##
## $mean
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
## 4.848 5.105 4.826 4.666 5.007
```



```
for (r in c(8,9)) {
  ds_filtrada <- ds_filtradaAll %>% filter(essround == r)
  survey.design <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada)

  # 1. CONFIGURAL EQUIVALENCE
  ## Add the "meanstructure" argument to add means/intercepts
  lavaan.conf3 <- lavaan(model3, data=ds_filtrada,
    auto.fix.first=TRUE, #factor loading of first indicator set to 1
    int.ov.free=TRUE,   #intercepts not fixed to 0
    meanstructure=TRUE, #the means of the observed variables enter the model,
    auto.var=TRUE,      #residual variances and variances of exogeneous laten
    auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are inclu
    estimator="MLM",
    group = "cntry",
    group.label = countries
    #group.equal = ... #vector for multigroup analysis specify the pattern o
  )
  survey.conf3 <- lavaan.survey(lavaan.fit=lavaan.conf3,survey.design=survey.design)
```

```

assign(paste0("survey.conf3",r),survey.conf3)
# 2. METRIC EQUIVALENCE: set the factor loadings equal across groups

lavaan.metrfit3 <- lavaan(model3, data=ds_filtrada,
  auto.fix.first=TRUE, #factor loading of first indicator set to 1
  int.ov.free=TRUE, #intercepts not fixed to 0
  meanstructure=TRUE, #the means of the observed variables enter the model, n
  auto.var=TRUE, #residual variances and variances of exogeneous latent
  auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are include
  estimator="MLM",
  group = "cntry",
  group.label = countries,
  group.equal=c("loadings") #vector for multigroup analysis specify the pattern
)
survey.metrfit3 <- lavaan.survey(lavaan.fit=lavaan.metrfit3,survey.design=survey.design)

# 3. SCALAR EQUIVALENCE: set the factor loadings and the intercepts equal across groups

lavaan.scalfit3 <- lavaan(model3, data=ds_filtrada,
  auto.fix.first=TRUE, #factor loading of first indicator set to 1
  int.ov.free=TRUE, #intercepts not fixed to 0
  meanstructure=TRUE, #the means of the observed variables enter the model, n
  auto.var=TRUE, #residual variances and variances of exogeneous latent
  auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are include
  estimator="MLM",
  group = "cntry",
  group.label = countries,
  group.equal=c("loadings","intercepts"))
survey.scalfit3 <- lavaan.survey(lavaan.fit=lavaan.scalfit3,survey.design=survey.design)

# 4. check whether factor variances are equal across groups
lavaan.varianfit3 <- lavaan(model3, data=ds_filtrada,
  auto.fix.first=TRUE, #factor loading of first indicator set to 1
  int.ov.free=TRUE, #intercepts not fixed to 0
  meanstructure=TRUE, #the means of the observed variables enter the model, n
  auto.var=TRUE, #residual variances and variances of exogeneous latent
  auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are include
  estimator="MLM",
  group = "cntry",
  group.label = countries,
  group.equal=c("loadings","intercepts","lv.variances"))
survey.varianfit3 <- lavaan.survey(lavaan.fit=lavaan.varianfit3,survey.design=survey.design)

invar <- data.frame(round(rbind(Configural = fitMeasures(survey.conf3, c("cfi", "rmsea", "srmr")),
Metric = fitMeasures(survey.metrfit3, c("cfi", "rmsea", "srmr")),
Scalar = fitMeasures(survey.scalfit3, c("cfi", "rmsea", "srmr")),
Strict = fitMeasures(survey.varianfit3, c("cfi", "rmsea", "srmr"))),3))
dif <- invar %>%
  mutate_all(funs(. - lag(.)))
print(paste("ESS round: ", r))
print(cbind(invar,dif))

```

```

}

## [1] "ESS round: 8"
##           cfi rmsea srmr      cfi  rmsea  srmr
## Configural 0.982 0.062 0.018      NA     NA     NA
## Metric     0.974 0.057 0.029 -0.008 -0.005 0.011
## Scalar     0.886 0.100 0.059 -0.088  0.043 0.030
## Strict     0.852 0.105 0.106 -0.034  0.005 0.047
## [1] "ESS round: 9"
##           cfi rmsea srmr      cfi  rmsea  srmr
## Configural 0.979 0.066 0.018      NA     NA     NA
## Metric     0.968 0.063 0.032 -0.011 -0.003 0.014
## Scalar     0.870 0.107 0.063 -0.098  0.044 0.031
## Strict     0.838 0.109 0.103 -0.032  0.002 0.040

```

Model SEM

```

# semmodel <-'
# benev =~ iphlppl_r + iplylfr_r
# unive =~ ipeqopt_r + ipudrst_r + impenv_r
# unive ~~ benev
# unive ~ agea + gndrD + eisced1 + eisced2 + eisced3 + eisced4 + eisced5 + eisced6 + domicil2 + domicil3 + domicil4
# '

semmodel <-'
Benev =~ iphlppl_r + iplylfr_r
Unive =~ ipeqopt_r + ipudrst_r + impenv_r
STrasc =~ Unive + Benev
STrasc ~ agea + gndrD + eisced2 + eisced3 + domicil2 + domicil3 + domicil4
'

for (r in c(8,9)) {
  ds_filtrada2 <- ds_filtradaAll %>% filter(essround == r)
  survey.design2 <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada2)

  lavaan.semfit <- lavaan(semmodel, data=ds_filtrada2,
    auto.fix.first=TRUE, #factor loading of first indicator set to 1
    int.ov.free=TRUE,    #intercepts not fixed to 0
    meanstructure=TRUE,  #the means of the observed variables enter the model, not the latent variables
    auto.var=TRUE,        #residual variances and variances of exogenous latent variables are included
    auto.cov.lv.x=TRUE,   #covariances of exogenous latent variables are included
    estimator="MLM",
    cluster = "cntry")

  survey.semfit <- lavaan.survey(lavaan.fit=lavaan.semfit,survey.design=survey.design2)
  assign(paste0("survey.semfit",r),survey.semfit)

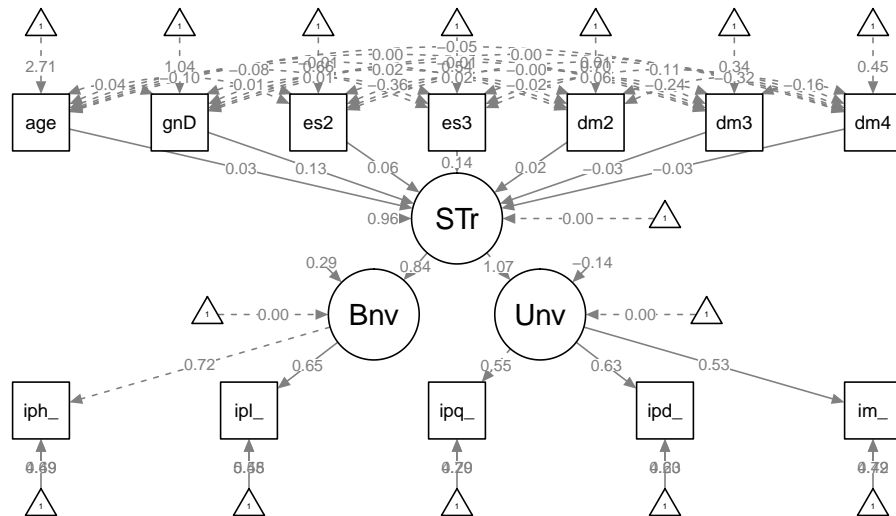
  print(paste("ESS round: ", r))
  print(fitMeasures(survey.semfit, c("cfi", "rmsea", "srmr")))
  print(modindices(survey.semfit,sort=T)[1:10,])
  invisible(semPaths(survey.semfit,"model","stand", style = "lisrel"))
}

```

```

## [1] "ESS round: 8"
##   cfi rmsea srmr
## 0.934 0.046 0.021
##      lhs op      rhs      mi      epc sepc.lv sepc.all sepc.nox
## 82 iplylfr_r ~~ impenv_r 177.131 0.067 0.067 0.111 0.111
## 85 ipudrst_r ~~ impenv_r 142.662 -0.079 -0.079 -0.111 -0.111
## 73 STRasc == ipeqopt_r 142.660 1.605 1.008 0.941 0.941
## 83 ipeqopt_r ~~ ipudrst_r 93.195 0.068 0.068 0.094 0.094
## 75 STRasc == impenv_r 93.189 -1.189 -0.747 -0.723 -0.723
## 68 Benev == impenv_r 81.100 0.570 0.402 0.389 0.389
## 66 Benev == ipeqopt_r 73.928 -0.587 -0.415 -0.387 -0.387
## 70 Unive == iplylfr_r 48.066 -2.602 -1.532 -1.702 -1.702
## 69 Unive == iphlppl_r 48.063 3.144 1.852 1.882 1.882
## 80 iplylfr_r ~~ ipeqopt_r 45.105 -0.035 -0.035 -0.058 -0.058

```

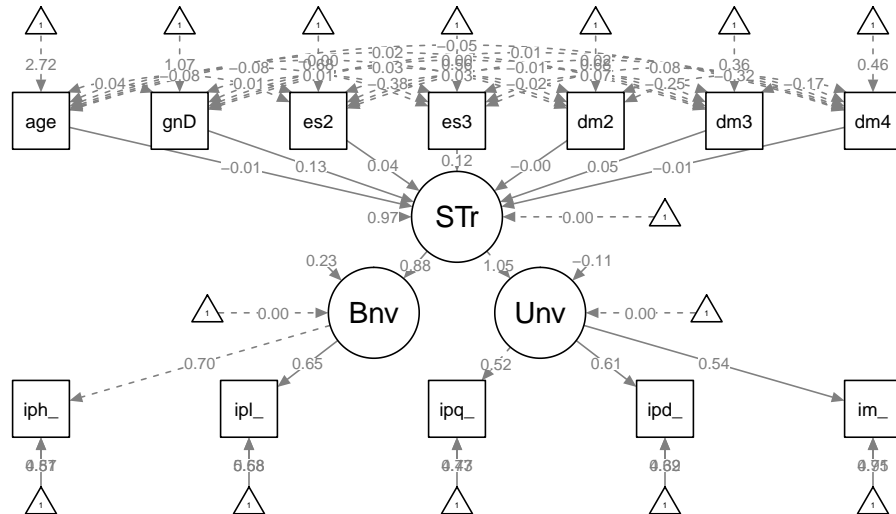


```

## [1] "ESS round: 9"
##   cfi rmsea srmr
## 0.938 0.043 0.019
##      lhs op      rhs      mi      epc sepc.lv sepc.all sepc.nox
## 82 iplylfr_r ~~ impenv_r 360.764 0.094 0.094 0.168 0.168
## 68 Benev == impenv_r 156.189 1.120 0.756 0.765 0.765
## 75 STRasc == impenv_r 121.568 -1.964 -1.134 -1.147 -1.147
## 83 ipeqopt_r ~~ ipudrst_r 121.568 0.075 0.075 0.102 0.102
## 85 ipudrst_r ~~ impenv_r 89.875 -0.062 -0.062 -0.091 -0.091
## 73 STRasc == ipeqopt_r 89.870 1.742 1.006 0.956 0.956
## 81 iplylfr_r ~~ ipudrst_r 79.414 -0.049 -0.049 -0.090 -0.090

```

```
## 80 iplylfr_r ~~ ipeqopt_r 70.882 -0.044 -0.044 -0.073 -0.073
## 79 iphlppl_r ~~ impenv_r 51.277 -0.040 -0.040 -0.068 -0.068
## 66 Benev == ipeqopt_r 42.253 -0.605 -0.408 -0.388 -0.388
```



```
for (r in c(8,9)) {
  ds_filtrada2 <- ds_filtradaAll %>% filter(essround == r)
  survey.design2 <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada2)

  # 1. CONFIGURAL EQUIVALENCE
  ## Add the "meanstructure" argument to add means/intercepts
  lavaan.semconffit3 <- lavaan(semmodel, data=ds_filtrada2,
    auto.fix.first=TRUE, #factor loading of first indicator set to 1
    int.ov.free=TRUE, #intercepts not fixed to 0
    meanstructure=TRUE, #the means of the observed variables enter the model,
    auto.var=TRUE, #residual variances and variances of exogeneous laten
    auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are inclu
    estimator="MLM",
    group = "cntry",
    group.label = countries
    #group.equal = ... #vector for multigroup analysis specify the pattern o
  )

  survey.semconffit3 <- lavaan.survey(lavaan.fit=lavaan.semconffit3,survey.design=survey.design2)
  assign(paste0("survey.semconffit3r",r),survey.semconffit3)
  # 2. METRIC EQUIVALENCE: set the factor loadings equal across groups

  lavaan.semmetrfit3 <- lavaan(semmodel, data=ds_filtrada2,
```

```

        auto.fix.first=TRUE, #factor loading of first indicator set to 1
        int.ov.free=TRUE,   #intercepts not fixed to 0
        meanstructure=TRUE, #the means of the observed variables enter the model, n
        auto.var=TRUE,      #residual variances and variances of exogeneous latent
        auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are include
        estimator="MLM",
        group = "cntry",
        group.label = countries,
        group.equal=c("loadings") #vector for multigroup analysis specify the pattern
    )
survey.semimetrfit3 <- lavaan.survey(lavaan.fit=lavaan.semimetrfit3,survey.design=survey.design2)

# 3. SCALAR EQUIVALENCE: set the factor loadings and the intercepts equal across groups

lavaan.semscalfit3 <- lavaan(semmodel, data=ds_filtrada2,
    auto.fix.first=TRUE, #factor loading of first indicator set to 1
    int.ov.free=TRUE,   #intercepts not fixed to 0
    meanstructure=TRUE, #the means of the observed variables enter the model, n
    auto.var=TRUE,      #residual variances and variances of exogeneous latent
    auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are include
    estimator="MLM",
    group = "cntry",
    group.label = countries,
    group.equal=c("loadings","intercepts"))
survey.semscalfit3 <- lavaan.survey(lavaan.fit=lavaan.semscalfit3,survey.design=survey.design2)

# 4. check whether factor variances are equal across groups
lavaan.semvarianfit3 <- lavaan(semmodel, data=ds_filtrada2,
    auto.fix.first=TRUE, #factor loading of first indicator set to 1
    int.ov.free=TRUE,   #intercepts not fixed to 0
    meanstructure=TRUE, #the means of the observed variables enter the model, n
    auto.var=TRUE,      #residual variances and variances of exogeneous latent
    auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are include
    estimator="MLM",
    group = "cntry",
    group.label = countries,
    group.equal=c("loadings","intercepts","lv.variances"))
survey.semvarianfit3 <- lavaan.survey(lavaan.fit=lavaan.semvarianfit3,survey.design=survey.design2)

seminvar <- data.frame(round(rbind(Configural = fitMeasures(survey.semconffit3, c("cfi", "rmsea", "srmr")),
    Metric = fitMeasures(survey.semimetrfit3, c("cfi", "rmsea", "srmr")),
    Scalar = fitMeasures(survey.semscalfit3, c("cfi", "rmsea", "srmr")),
    Strict = fitMeasures(survey.semvarianfit3, c("cfi", "rmsea", "srmr"))))

semdif <- seminvar %>%
    mutate_all(funs(. - lag(.)))
print(paste("ESS round: ", r))
print(cbind(seminvar,semdif))
}

```

```

## [1] "ESS round:  8"
##           cfi rmsea srmr      cfi rmsea srmr
## Configural 0.900 0.056 0.029      NA   NA   NA

```



```
## Metric      0.888 0.056 0.031 -0.012 0.000 0.002
## Scalar      0.812 0.071 0.040 -0.076 0.015 0.009
## Strict      0.775 0.074 0.061 -0.037 0.003 0.021
## [1] "ESS round: 9"
##              cfi rmsea srmr      cfi rmsea srmr
## Configural 0.917 0.050 0.025      NA      NA      NA
## Metric      0.905 0.051 0.029 -0.012 0.001 0.004
## Scalar      0.816 0.068 0.039 -0.089 0.017 0.010
## Strict      0.770 0.074 0.062 -0.046 0.006 0.023
```

```
cntrylabels <- num_lab("

```

```
  1 Austria
  2 Belgium
  3 Czechia
  4 Estonia
  5 France
  6 Germany
  7 Ireland
  8 Italy
  9 Netherlands
 10  Norway
 11  Poland
 12  Slovenia
 13  Switzerland
 14  United Kingdom"
```

```
)
```

```
sum1 <-full_join(parameterEstimates(survey.fit3r8),
  parameterEstimates(survey.fit3r9),
  by=c("lhs", "op", "rhs"))
```

```
sum2 <-full_join(parameterEstimates(survey.conf3r8),
  parameterEstimates(survey.conf3r9),
  by=c("lhs", "op", "rhs", "block", "group"))
```

```
sum2$block <- as.character(sum2$block)
```

```
sum3 <-full_join(parameterEstimates(survey.semfit8),
  parameterEstimates(survey.semfit9),
  by=c("lhs", "op", "rhs"))
```

```
sum4 <-full_join(parameterEstimates(survey.semconf3r8),
  parameterEstimates(survey.semconf3r9),
  by=c("lhs", "op", "rhs", "block", "group"))
```

```
sum4 <- sum4 %>% mutate(est.x = ifelse(pvalue.x > 0.05, NA, round(est.x,3)),
  est.x = ifelse(rhs == "agea", est.x*10, est.x),
  est.y = ifelse(pvalue.y > 0.05, NA, round(est.y,3)),
  est.y = ifelse(rhs == "agea", est.y*10, est.y),
  rhs1 = ifelse(rhs == "gndrD", "Gender (Female / Male)",
    ifelse(rhs == "agea", "Age (10 years increment)",
      ifelse(rhs == "eiscd2", "Highest level of education, (Upper secondary)",
        ifelse(rhs == "eiscd3", "Highest level of education, (Tertiary)",
          ifelse(rhs == "domicil2", "Domicile (Town or village)",
            ifelse(rhs == "domicil3", "Domicile (City or town)",
              ifelse(rhs == "domicil4", "Domicile (Country)",
                NA))))))))))
```

```
val_lab(sum4$block) <- cntrylabels
```

```
sum4$block <- as.character(sum4$block)
```

```

dir <- "G:/My Drive/Master in Statistics/Structural equations/Paper/"
write.table(sum1,paste0(dir,"Parametersfit.csv"), sep = ",", row.names = FALSE)
write.table(sum2,paste0(dir,"ParametersConffit.csv"), sep = ",", row.names = FALSE)

write.table(sum3,paste0(dir,"ParametersSemfit.csv"), sep = ",", row.names = FALSE)
write.table(sum4,paste0(dir,"ParametersSemConffit.csv"), sep = ",", row.names = FALSE)

```

Multilevel SEM

```

Msemmodel <- '
level: 1
Benev_w =~ iphlppl_r + iplylfr_r
Unive_w =~ ipeqopt_r + ipudrst_r + impenv_r
STrasc =~ Unive_w + Benev_w
STrasc ~ agea + gndrD + eisced2 + eisced3 + domicil2 + domicil3 + domicil4
level: 2
Benev_b =~ iphlppl_r + iplylfr_r
Unive_b =~ ipeqopt_r + ipudrst_r + impenv_r
'
for (r in c(8,9)) {
  ds_filtrada2 <- ds_filtradaAll %>% filter(essround == r)

  lavaan.Msemfit <- lavaan(Msemmodel, data=ds_filtrada2,
                           auto.fix.first=TRUE, #factor loading of first indicator set to 1
                           int.ov.free=TRUE,   #intercepts not fixed to 0
                           meanstructure=TRUE,  #the means of the observed variables enter the model, n
                           auto.var=TRUE,       #residual variances and variances of exogeneous latent
                           auto.cov.lv.x=TRUE,  #covariances of exogeneous latent variables are include
                           cluster = "cntry")
  assign(paste0("survey.Msemfit",r),survey.semfit)

  print(paste("ESS round: ", r))
  print(summary(lavaan.Msemfit, standardized=T, rsquare=T, fit.measures=T))

  print(fitMeasures(lavaan.Msemfit, c("cfi", "rmsea", "srmr")))
  print(modindices(lavaan.Msemfit,sort=T)[1:10,])
}

```

```

## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative

```

```

## [1] "ESS round: 8"
## lavaan 0.6-5 ended normally after 147 iterations

```

```

##
## Estimator ML
## Optimization method NLMINB
## Number of free parameters 35
##
## Used Total
## Number of observations 27310 28080
## Number of clusters [cntry] 14
##

```

```

## Model Test User Model:
##
##   Test statistic           1953.458
##   Degrees of freedom       35
##   P-value (Chi-square)     0.000
##
## Model Test Baseline Model:
##
##   Test statistic           65227.640
##   Degrees of freedom       55
##   P-value                   0.000
##
## User Model versus Baseline Model:
##
##   Comparative Fit Index (CFI)       0.971
##   Tucker-Lewis Index (TLI)         0.954
##
## Loglikelihood and Information Criteria:
##
##   Loglikelihood user model (H0)      -379815.388
##   Loglikelihood unrestricted model (H1) -378838.659
##
##   Akaike (AIC)                      759700.777
##   Bayesian (BIC)                    759988.302
##   Sample-size adjusted Bayesian (BIC) 759877.073
##
## Root Mean Square Error of Approximation:
##
##   RMSEA                           0.045
##   90 Percent confidence interval - lower 0.043
##   90 Percent confidence interval - upper 0.047
##   P-value RMSEA <= 0.05             1.000
##
## Standardized Root Mean Square Residual (corr metric):
##
##   SRMR (within covariance matrix)     0.024
##   SRMR (between covariance matrix)    0.065
##
## Parameter Estimates:
##
##   Information                      Observed
##   Observed information based on      Hessian
##   Standard errors                   Standard
##
##
## Level 1 [within]:
##
## Latent Variables:
##
##           Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
## Benev_w =~
##   iphlppl_r        1.000
##   iplylfr_r        0.849    0.012   70.257   0.000    0.652    0.693
## Unive_w =~
##   ipeqopt_r        1.000
##                               0.547    0.529

```

```

##      ipudrst_r      1.106    0.018    61.852    0.000    0.605    0.599
##      impenv_r      1.010    0.018    56.813    0.000    0.553    0.547
##      STrasc =~
##      Unive_w      1.000          1.139    1.139
##      Benev_w      0.818    0.060    13.560    0.000    0.782    0.782
##
## Regressions:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      STrasc ~
##      agea      0.002    0.000    5.550    0.000    0.003    0.051
##      gndrD      0.140    0.010    13.976    0.000    0.224    0.112
##      eiscd2      0.121    0.010    11.723    0.000    0.194    0.090
##      eiscd3      0.203    0.013    15.160    0.000    0.326    0.137
##      domicil2     0.046    0.010    4.512    0.000    0.074    0.034
##      domicil3    -0.042    0.015    -2.848    0.004   -0.068   -0.021
##      domicil4     0.031    0.014    2.274    0.023    0.050    0.019
##
## Intercepts:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .iphlppl_r      0.000          0.000    0.000
##      .iplylfr_r      0.000          0.000    0.000
##      .ipeqopt_r      0.000          0.000    0.000
##      .ipudrst_r      0.000          0.000    0.000
##      .impenv_r      0.000          0.000    0.000
##      .Benev_w      0.000          0.000    0.000
##      .Unive_w      0.000          0.000    0.000
##      .STrasc      0.000          0.000    0.000
##
## Variances:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .iphlppl_r      0.460    0.007    68.075    0.000    0.460    0.520
##      .iplylfr_r      0.437    0.005    80.291    0.000    0.437    0.588
##      .ipeqopt_r      0.773    0.008    95.101    0.000    0.773    0.721
##      .ipudrst_r      0.656    0.008    86.533    0.000    0.656    0.642
##      .impenv_r      0.716    0.008    93.706    0.000    0.716    0.701
##      .Benev_w      0.165    0.019    8.495    0.000    0.388    0.388
##      .Unive_w     -0.089    0.028    -3.142    0.002   -0.298   -0.298
##      .STrasc      0.375    0.029    13.141    0.000    0.965    0.965
##
## R-Square:
##      Estimate
##      iphlppl_r      0.480
##      iplylfr_r      0.412
##      ipeqopt_r      0.279
##      ipudrst_r      0.358
##      impenv_r      0.299
##      Benev_w      0.612
##      Unive_w      NA
##      STrasc      0.035
##
## Level 2 [cntry]:
##
## Latent Variables:

```

```

##          Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## Benev_b =~
##   iphlppl_r      1.000
##   iplylfr_r      0.781    0.173    4.520    0.000    0.168    0.824
## Unive_b =~
##   ipeqopt_r      1.000
##   ipudrst_r      1.151    0.271    4.245    0.000    0.203    0.972
##   impenv_r       0.370    0.315    1.177    0.239    0.065    0.340
##
## Covariances:
##          Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## Benev_b ~~
##   Unive_b        0.041    0.018    2.226    0.026    1.083    1.083
##
## Intercepts:
##          Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##   .iphlppl_r     4.626    0.066   70.099    0.000    4.626   19.214
##   .iplylfr_r     4.899    0.056   87.590    0.000    4.899   24.021
##   .ipeqopt_r     4.574    0.064   71.394    0.000    4.574   20.011
##   .ipudrst_r     4.379    0.060   73.424    0.000    4.379   21.004
##   .impenv_r      4.580    0.055   83.048    0.000    4.580   23.839
##   Benev_b        0.000
##   Unive_b        0.000
##
## Variances:
##          Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##   .iphlppl_r     0.012    0.006    2.108    0.035    0.012    0.202
##   .iplylfr_r     0.013    0.006    2.422    0.015    0.013    0.322
##   .ipeqopt_r     0.021    0.008    2.562    0.010    0.021    0.407
##   .ipudrst_r     0.002    0.003    0.849    0.396    0.002    0.056
##   .impenv_r      0.033    0.013    2.533    0.011    0.033    0.885
##   Benev_b        0.046    0.022    2.118    0.034    1.000    1.000
##   Unive_b        0.031    0.018    1.709    0.088    1.000    1.000
##
## R-Square:
##          Estimate
##   iphlppl_r      0.798
##   iplylfr_r      0.678
##   ipeqopt_r      0.593
##   ipudrst_r      0.944
##   impenv_r       0.115
##
## $FIT
##          npar          fmin          chisq          df
##          35.000          2.880          1953.458          35.000
##          pvalue baseline.chisq baseline.df baseline.pvalue
##          0.000          65227.640          55.000          0.000
##          cfi          tli          logl unrestricted.logl
##          0.971          0.954          -379815.388          -378838.659
##          aic          bic          ntotal          bic2
##          759700.777          759988.302          27310.000          759877.073
##          rmsea rmsea.ci.lower rmsea.ci.upper rmsea.pvalue
##          0.045          0.043          0.047          1.000
##          srmr          srmr_within          srmr_between

```

```

##          0.089          0.024          0.065
##
## $PE
##      lhs op      rhs block level exo      est      se
## 1  Benev_w == iphlppl_r      1      1  0  1.000000e+00 0.0000000000
## 2  Benev_w == iplylfr_r      1      1  0  8.485993e-01 0.0120785488
## 3  Unive_w == ipeqopt_r      1      1  0  1.000000e+00 0.0000000000
## 4  Unive_w == ipudrst_r      1      1  0  1.105799e+00 0.0178781981
## 5  Unive_w == impenv_r      1      1  0  1.010434e+00 0.0177852031
## 6  STRasc == Unive_w      1      1  0  1.000000e+00 0.0000000000
## 7  STRasc == Benev_w      1      1  0  8.178122e-01 0.0603096967
## 8  STRasc ~ agea      1      1  0  1.722859e-03 0.0003104446
## 9  STRasc ~ gndrD      1      1  0  1.399431e-01 0.0100128038
## 10 STRasc ~ eiscd2      1      1  0  1.211314e-01 0.0103326822
## 11 STRasc ~ eiscd3      1      1  0  2.031945e-01 0.0134036335
## 12 STRasc ~ domicil2      1      1  0  4.618460e-02 0.0102364474
## 13 STRasc ~ domicil3      1      1  0 -4.219201e-02 0.0148141911
## 14 STRasc ~ domicil4      1      1  0  3.100358e-02 0.0136362820
## 15 iphlppl_r ~ iphlppl_r      1      1  0  4.602292e-01 0.0067606498
## 16 iplylfr_r ~ iplylfr_r      1      1  0  4.373426e-01 0.0054469451
## 17 ipeqopt_r ~ ipeqopt_r      1      1  0  7.725403e-01 0.0081233937
## 18 ipudrst_r ~ ipudrst_r      1      1  0  6.555265e-01 0.0075754809
## 19 impenv_r ~ impenv_r      1      1  0  7.158049e-01 0.0076388144
## 20 Benev_w ~ Benev_w      1      1  0  1.650797e-01 0.0194324383
## 21 Unive_w ~ Unive_w      1      1  0 -8.917544e-02 0.0283813360
## 22 STRasc ~ STRasc      1      1  0  3.752252e-01 0.0285534691
## 23 agea ~ agea      1      1  1  3.410479e+02 0.0000000000
## 24 agea ~ gndrD      1      1  1  2.198374e-01 0.0000000000
## 25 agea ~ eiscd2      1      1  1 -7.871643e-01 0.0000000000
## 26 agea ~ eiscd3      1      1  1 -4.428063e-01 0.0000000000
## 27 agea ~ domicil2      1      1  1 -1.265644e-01 0.0000000000
## 28 agea ~ domicil3      1      1  1  1.319128e-02 0.0000000000
## 29 agea ~ domicil4      1      1  1 -3.595062e-01 0.0000000000
## 30 gndrD ~ gndrD      1      1  1  2.497038e-01 0.0000000000
## 31 gndrD ~ eiscd2      1      1  1  7.219213e-04 0.0000000000
## 32 gndrD ~ eiscd3      1      1  1  3.103269e-03 0.0000000000
## 33 gndrD ~ domicil2      1      1  1  4.278976e-03 0.0000000000
## 34 gndrD ~ domicil3      1      1  1 -2.766908e-03 0.0000000000
## 35 gndrD ~ domicil4      1      1  1  1.353776e-03 0.0000000000
## 36 eiscd2 ~ eiscd2      1      1  1  2.139681e-01 0.0000000000
## 37 eiscd2 ~ eiscd3      1      1  1 -7.144008e-02 0.0000000000
## 38 eiscd2 ~ domicil2      1      1  1  5.272074e-03 0.0000000000
## 39 eiscd2 ~ domicil3      1      1  1 -3.777640e-04 0.0000000000
## 40 eiscd2 ~ domicil4      1      1  1  1.122347e-03 0.0000000000
## 41 eiscd3 ~ eiscd3      1      1  1  1.772719e-01 0.0000000000
## 42 eiscd3 ~ domicil2      1      1  1 -4.220485e-03 0.0000000000
## 43 eiscd3 ~ domicil3      1      1  1  8.044033e-03 0.0000000000
## 44 eiscd3 ~ domicil4      1      1  1  1.710203e-02 0.0000000000
## 45 domicil2 ~ domicil2      1      1  1  2.162388e-01 0.0000000000
## 46 domicil2 ~ domicil3      1      1  1 -3.335124e-02 0.0000000000
## 47 domicil2 ~ domicil4      1      1  1 -5.284087e-02 0.0000000000
## 48 domicil3 ~ domicil3      1      1  1  9.433493e-02 0.0000000000
## 49 domicil3 ~ domicil4      1      1  1 -1.761974e-02 0.0000000000
## 50 domicil4 ~ domicil4      1      1  1  1.391654e-01 0.0000000000

```

## 51	iphlppl_r ~1	1	1	0	0.000000e+00	0.0000000000
## 52	iplylfr_r ~1	1	1	0	0.000000e+00	0.0000000000
## 53	ipeqopt_r ~1	1	1	0	0.000000e+00	0.0000000000
## 54	ipudrst_r ~1	1	1	0	0.000000e+00	0.0000000000
## 55	impenv_r ~1	1	1	0	0.000000e+00	0.0000000000
## 56	agea ~1	1	1	1	4.892179e+01	0.0000000000
## 57	gndrD ~1	1	1	1	5.172098e-01	0.0000000000
## 58	eisced2 ~1	1	1	1	3.101794e-01	0.0000000000
## 59	eisced3 ~1	1	1	1	2.303186e-01	0.0000000000
## 60	domicil2 ~1	1	1	1	3.162578e-01	0.0000000000
## 61	domicil3 ~1	1	1	1	1.054559e-01	0.0000000000
## 62	domicil4 ~1	1	1	1	1.670817e-01	0.0000000000
## 63	Benev_w ~1	1	1	0	0.000000e+00	0.0000000000
## 64	Unive_w ~1	1	1	0	0.000000e+00	0.0000000000
## 65	STrasc ~1	1	1	0	0.000000e+00	0.0000000000
## 66	Benev_b == iphlppl_r	2	2	0	1.000000e+00	0.0000000000
## 67	Benev_b == iplylfr_r	2	2	0	7.808233e-01	0.1727607056
## 68	Unive_b == ipeqopt_r	2	2	0	1.000000e+00	0.0000000000
## 69	Unive_b == ipudrst_r	2	2	0	1.150702e+00	0.2710566878
## 70	Unive_b == impenv_r	2	2	0	3.704599e-01	0.3148704563
## 71	iphlppl_r ~ iphlppl_r	2	2	0	1.170712e-02	0.0055531466
## 72	iplylfr_r ~ iplylfr_r	2	2	0	1.338534e-02	0.0055272494
## 73	ipeqopt_r ~ ipeqopt_r	2	2	0	2.124304e-02	0.0082911657
## 74	ipudrst_r ~ ipudrst_r	2	2	0	2.415417e-03	0.0028446716
## 75	impenv_r ~ impenv_r	2	2	0	3.265802e-02	0.0128952091
## 76	Benev_b ~ Benev_b	2	2	0	4.626990e-02	0.0218439055
## 77	Unive_b ~ Unive_b	2	2	0	3.100264e-02	0.0181439102
## 78	Benev_b ~ Unive_b	2	2	0	4.102017e-02	0.0184264546
## 79	iphlppl_r ~1	2	2	0	4.626470e+00	0.0659993573
## 80	iplylfr_r ~1	2	2	0	4.899120e+00	0.0559324126
## 81	ipeqopt_r ~1	2	2	0	4.573970e+00	0.0640669001
## 82	ipudrst_r ~1	2	2	0	4.379031e+00	0.0596404552
## 83	impenv_r ~1	2	2	0	4.580115e+00	0.0551502750
## 84	Benev_b ~1	2	2	0	0.000000e+00	0.0000000000
## 85	Unive_b ~1	2	2	0	0.000000e+00	0.0000000000
## 86	iphlppl_r r2 iphlppl_r	1	1	0	4.801047e-01	NA
## 87	iplylfr_r r2 iplylfr_r	1	1	0	4.116976e-01	NA
## 88	ipeqopt_r r2 ipeqopt_r	1	1	0	2.793465e-01	NA
## 89	ipudrst_r r2 ipudrst_r	1	1	0	3.583979e-01	NA
## 90	impenv_r r2 impenv_r	1	1	0	2.992925e-01	NA
## 91	Benev_w r2 Benev_w	1	1	0	6.115819e-01	NA
## 92	Unive_w r2 Unive_w	1	1	0	NA	NA
## 93	STrasc r2 STrasc	1	1	0	3.450406e-02	NA
## 94	iphlppl_r r2 iphlppl_r	2	2	0	7.980731e-01	NA
## 95	iplylfr_r r2 iplylfr_r	2	2	0	6.782016e-01	NA
## 96	ipeqopt_r r2 ipeqopt_r	2	2	0	5.934011e-01	NA
## 97	ipudrst_r r2 ipudrst_r	2	2	0	9.444303e-01	NA
## 98	impenv_r r2 impenv_r	2	2	0	1.152666e-01	NA
##	z pvalue		std.lv	std.all	std.nox	
## 1	NA NA	6.519242e-01	0.692895849	6.928958e-01		
## 2	70.2567244 0.000000e+00	5.532224e-01	0.641636634	6.416366e-01		
## 3	NA NA	5.472287e-01	0.528532358	5.285324e-01		
## 4	61.8518028 0.000000e+00	6.051248e-01	0.598663436	5.986634e-01		
## 5	56.8131826 0.000000e+00	5.529385e-01	0.547076286	5.470763e-01		

## 6	NA	NA	1.139205e+00	1.139205087	1.139205e+00
## 7	13.5602112	0.000000e+00	7.820370e-01	0.782036999	7.820370e-01
## 8	5.5496511	2.862403e-08	2.763624e-03	0.051037175	2.763624e-03
## 9	13.9764169	0.000000e+00	2.244816e-01	0.112174297	2.244816e-01
## 10	11.7231331	0.000000e+00	1.943059e-01	0.089879477	1.943059e-01
## 11	15.1596579	0.000000e+00	3.259426e-01	0.137233814	3.259426e-01
## 12	4.5117797	6.428594e-06	7.408433e-02	0.034450312	7.408433e-02
## 13	-2.8480806	4.398379e-03	-6.767986e-02	-0.020787186	-6.767986e-02
## 14	2.2736093	2.298949e-02	4.973258e-02	0.018552678	4.973258e-02
## 15	68.0747004	0.000000e+00	4.602292e-01	0.519895342	5.198953e-01
## 16	80.2913617	0.000000e+00	4.373426e-01	0.588302431	5.883024e-01
## 17	95.1006785	0.000000e+00	7.725403e-01	0.720653547	7.206535e-01
## 18	86.5326605	0.000000e+00	6.555265e-01	0.641602090	6.416021e-01
## 19	93.7062799	0.000000e+00	7.158049e-01	0.700707537	7.007075e-01
## 20	8.4950585	0.000000e+00	3.884181e-01	0.388418132	3.884181e-01
## 21	-3.1420453	1.677721e-03	-2.977882e-01	-0.297788230	-2.977882e-01
## 22	13.1411435	0.000000e+00	9.654959e-01	0.965495945	9.654959e-01
## 23	NA	NA	3.410479e+02	1.000000000	3.410479e+02
## 24	NA	NA	2.198374e-01	0.023822173	2.198374e-01
## 25	NA	NA	-7.871643e-01	-0.092147415	-7.871643e-01
## 26	NA	NA	-4.428063e-01	-0.056949004	-4.428063e-01
## 27	NA	NA	-1.265644e-01	-0.014737949	-1.265644e-01
## 28	NA	NA	1.319128e-02	0.002325642	1.319128e-02
## 29	NA	NA	-3.595062e-01	-0.052183487	-3.595062e-01
## 30	NA	NA	2.497038e-01	1.000000000	2.497038e-01
## 31	NA	NA	7.219213e-04	0.003123221	7.219213e-04
## 32	NA	NA	3.103269e-03	0.014749824	3.103269e-03
## 33	NA	NA	4.278976e-03	0.018414523	4.278976e-03
## 34	NA	NA	-2.766908e-03	-0.018027930	-2.766908e-03
## 35	NA	NA	1.353776e-03	0.007262207	1.353776e-03
## 36	NA	NA	2.139681e-01	1.000000000	2.139681e-01
## 37	NA	NA	-7.144008e-02	-0.366815252	-7.144008e-02
## 38	NA	NA	5.272074e-03	0.024509820	5.272074e-03
## 39	NA	NA	-3.777640e-04	-0.002658947	-3.777640e-04
## 40	NA	NA	1.122347e-03	0.006504097	1.122347e-03
## 41	NA	NA	1.772719e-01	1.000000000	1.772719e-01
## 42	NA	NA	-4.220485e-03	-0.021556367	-4.220485e-03
## 43	NA	NA	8.044033e-03	0.062203894	8.044033e-03
## 44	NA	NA	1.710203e-02	0.108883492	1.710203e-02
## 45	NA	NA	2.162388e-01	1.000000000	2.162388e-01
## 46	NA	NA	-3.335124e-02	-0.233511848	-3.335124e-02
## 47	NA	NA	-5.284087e-02	-0.304605388	-5.284087e-02
## 48	NA	NA	9.433493e-02	1.000000000	9.433493e-02
## 49	NA	NA	-1.761974e-02	-0.153779230	-1.761974e-02
## 50	NA	NA	1.391654e-01	1.000000000	1.391654e-01
## 51	NA	NA	0.000000e+00	0.000000000	0.000000e+00
## 52	NA	NA	0.000000e+00	0.000000000	0.000000e+00
## 53	NA	NA	0.000000e+00	0.000000000	0.000000e+00
## 54	NA	NA	0.000000e+00	0.000000000	0.000000e+00
## 55	NA	NA	0.000000e+00	0.000000000	0.000000e+00
## 56	NA	NA	4.892179e+01	2.649077414	4.892179e+01
## 57	NA	NA	5.172098e-01	1.035032915	5.172098e-01
## 58	NA	NA	3.101794e-01	0.670561196	3.101794e-01
## 59	NA	NA	2.303186e-01	0.547027257	2.303186e-01


```

## 60      NA      NA 3.162578e-01 0.680102563 3.162578e-01
## 61      NA      NA 1.054559e-01 0.343347991 1.054559e-01
## 62      NA      NA 1.670817e-01 0.447881548 1.670817e-01
## 63      NA      NA 0.000000e+00 0.000000000 0.000000e+00
## 64      NA      NA 0.000000e+00 0.000000000 0.000000e+00
## 65      NA      NA 0.000000e+00 0.000000000 0.000000e+00
## 66      NA      NA 2.151044e-01 0.893349386 8.933494e-01
## 67 4.5196814 6.193276e-06 1.679585e-01 0.823529934 8.235299e-01
## 68      NA      NA 1.760757e-01 0.770325306 7.703253e-01
## 69 4.2452431 2.183565e-05 2.026105e-01 0.971818046 9.718180e-01
## 70 1.1765469 2.393764e-01 6.522897e-02 0.339509391 3.395094e-01
## 71 2.1081953 3.501410e-02 1.170712e-02 0.201926874 2.019269e-01
## 72 2.4216993 1.544813e-02 1.338534e-02 0.321798448 3.217984e-01
## 73 2.5621290 1.040327e-02 2.124304e-02 0.406598923 4.065989e-01
## 74 0.8491022 3.958244e-01 2.415417e-03 0.055569686 5.556969e-02
## 75 2.5325700 1.132297e-02 3.265802e-02 0.884733373 8.847334e-01
## 76 2.1182063 3.415760e-02 1.000000e+00 1.000000000 1.000000e+00
## 77 1.7087078 8.750509e-02 1.000000e+00 1.000000000 1.000000e+00
## 78 2.2261563 2.600371e-02 1.083051e+00 1.083050787 1.083051e+00
## 79 70.0987129 0.000000e+00 4.626470e+00 19.214178638 1.921418e+01
## 80 87.5899998 0.000000e+00 4.899120e+00 24.021239226 2.402124e+01
## 81 71.3936461 0.000000e+00 4.573970e+00 20.010967735 2.001097e+01
## 82 73.4238402 0.000000e+00 4.379031e+00 21.003949270 2.100395e+01
## 83 83.0479077 0.000000e+00 4.580115e+00 23.838979195 2.383898e+01
## 84      NA      NA 0.000000e+00 0.000000000 0.000000e+00
## 85      NA      NA 0.000000e+00 0.000000000 0.000000e+00
## 86      NA      NA      NA      NA      NA
## 87      NA      NA      NA      NA      NA
## 88      NA      NA      NA      NA      NA
## 89      NA      NA      NA      NA      NA
## 90      NA      NA      NA      NA      NA
## 91      NA      NA      NA      NA      NA
## 92      NA      NA      NA      NA      NA
## 93      NA      NA      NA      NA      NA
## 94      NA      NA      NA      NA      NA
## 95      NA      NA      NA      NA      NA
## 96      NA      NA      NA      NA      NA
## 97      NA      NA      NA      NA      NA
## 98      NA      NA      NA      NA      NA

```

```

##
##   cfi rmsea srmr
## 0.971 0.045 0.089

```

```

## Warning in lav_start_check_cov(lavpartable = lavpartable, start = START): lavaan WARNING: starting variables involved are: Benev_b  Unive_b  [in block 2]
##

```

```

##      lhs op      rhs block group level      mi      epc sepc.lv
## 102 iplylfr_r ~~ impenv_r      1      1      1 212.163 0.072 0.072
## 105 ipudrst_r ~~ impenv_r      1      1      1 171.238 -0.085 -0.085
## 93   STrasc == ipeqopt_r      1      1      1 170.634 0.853 0.531
## 95   STrasc == impenv_r      1      1      1 123.776 -0.739 -0.461
## 103 ipeqopt_r ~~ ipudrst_r      1      1      1 123.715 0.072 0.072
## 88   Benev_w == impenv_r      1      1      1 82.827 0.577 0.376
## 100 iplylfr_r ~~ ipeqopt_r      1      1      1 65.035 -0.040 -0.040
## 86   Benev_w == ipeqopt_r      1      1      1 52.480 -0.457 -0.298

```

```

## 101 iplylfr_r ~~ ipudrst_r      1      1      1 28.073 -0.027 -0.027
## 98  iphlppl_r ~~ ipudrst_r      1      1      1 23.915  0.028  0.028
##      sepc.all sepc.nox
## 102      0.128      0.128
## 105     -0.124     -0.124
## 93      0.513      0.513
## 95     -0.456     -0.456
## 103      0.101      0.101
## 88      0.372      0.372
## 100     -0.069     -0.069
## 86     -0.288     -0.288
## 101     -0.051     -0.051
## 98      0.051      0.051

## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative

## [1] "ESS round:  9"
## lavaan 0.6-5 ended normally after 157 iterations
##
##      Estimator                      ML
##      Optimization method          NLMINB
##      Number of free parameters      35
##
##                               Used      Total
##      Number of observations        26525    27540
##      Number of clusters [cntry]      14
##
## Model Test User Model:
##
##      Test statistic          1512.979
##      Degrees of freedom        35
##      P-value (Chi-square)      0.000
##
## Model Test Baseline Model:
##
##      Test statistic          61262.378
##      Degrees of freedom        55
##      P-value                  0.000
##
## User Model versus Baseline Model:
##
##      Comparative Fit Index (CFI)      0.976
##      Tucker-Lewis Index (TLI)        0.962
##
## Loglikelihood and Information Criteria:
##
##      Loglikelihood user model (H0)      -368574.145
##      Loglikelihood unrestricted model (H1) -367817.656
##
##      Akaike (AIC)                    737218.291
##      Bayesian (BIC)                   737504.795
##      Sample-size adjusted Bayesian (BIC) 737393.566
##
## Root Mean Square Error of Approximation:

```

```

##
## RMSEA 0.040
## 90 Percent confidence interval - lower 0.038
## 90 Percent confidence interval - upper 0.042
## P-value RMSEA <= 0.05 1.000
##
## Standardized Root Mean Square Residual (corr metric):
##
## SRMR (within covariance matrix) 0.020
## SRMR (between covariance matrix) 0.049
##
## Parameter Estimates:
##
## Information Observed
## Observed information based on Hessian
## Standard errors Standard
##
##
## Level 1 [within]:
##
## Latent Variables:
## Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## Benev_w =~
## iphlppl_r 1.000 0.620 0.672
## iplylfr_r 0.873 0.013 68.147 0.000 0.541 0.639
## Unive_w =~
## ipeqopt_r 1.000 0.509 0.499
## ipudrst_r 1.136 0.020 57.569 0.000 0.578 0.580
## impenv_r 1.055 0.019 54.242 0.000 0.537 0.551
## STrasc =~
## Unive_w 1.000 1.084 1.084
## Benev_w 0.948 0.055 17.288 0.000 0.844 0.844
##
## Regressions:
## Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## STrasc ~
## agea -0.000 0.000 -0.735 0.462 -0.000 -0.006
## gndrD 0.147 0.008 17.926 0.000 0.267 0.133
## eiscd2 0.093 0.010 9.286 0.000 0.168 0.078
## eiscd3 0.162 0.013 12.521 0.000 0.294 0.126
## domicil2 0.022 0.010 2.335 0.020 0.040 0.019
## domicil3 0.057 0.014 4.168 0.000 0.103 0.033
## domicil4 0.049 0.012 4.123 0.000 0.089 0.034
##
## Intercepts:
## Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## .iphlppl_r 0.000 0.000 0.000
## .iplylfr_r 0.000 0.000 0.000
## .ipeqopt_r 0.000 0.000 0.000
## .ipudrst_r 0.000 0.000 0.000
## .impenv_r 0.000 0.000 0.000
## .Benev_w 0.000 0.000 0.000
## .Unive_w 0.000 0.000 0.000
## .STrasc 0.000 0.000 0.000

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##
## Variances:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .iphlppl_r      0.466   0.007  70.954   0.000   0.466   0.548
##      .iplylfr_r      0.424   0.005  78.579   0.000   0.424   0.591
##      .ipeqopt_r      0.781   0.008  96.636   0.000   0.781   0.751
##      .ipudrst_r      0.659   0.008  86.837   0.000   0.659   0.663
##      .impenv_r       0.661   0.007  91.887   0.000   0.661   0.696
##      .Benev_w        0.111   0.016   6.916   0.000   0.288   0.288
##      .Unive_w       -0.045   0.017  -2.626   0.009  -0.175  -0.175
##      .STrasc         0.294   0.018  16.254   0.000   0.964   0.964
##
## R-Square:
##      Estimate
##      iphlpppl_r      0.452
##      iplylfr_r       0.409
##      ipeqopt_r       0.249
##      ipudrst_r       0.337
##      impenv_r        0.304
##      Benev_w         0.712
##      Unive_w         NA
##      STTrasc         0.036
##
##
## Level 2 [cntry]:
##
## Latent Variables:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      Benev_b =~
##      iphlpppl_r      1.000
##      iplylfr_r      0.613   0.159   3.858   0.000   0.240   0.932
##      Unive_b =~
##      ipeqopt_r      1.000
##      ipudrst_r      1.064   0.243   4.370   0.000   0.191   0.796
##      impenv_r       0.388   0.221   1.753   0.080   0.203   0.937
##      0.074   0.472
##
## Covariances:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      Benev_b ~~
##      Unive_b         0.049   0.021   2.315   0.021   1.073   1.073
##
## Intercepts:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .iphlppl_r      4.713   0.070  67.064   0.000   4.713  18.306
##      .iplylfr_r      4.979   0.054  91.952   0.000   4.979  25.266
##      .ipeqopt_r      4.680   0.066  70.626   0.000   4.680  19.498
##      .ipudrst_r      4.504   0.061  73.957   0.000   4.504  20.759
##      .impenv_r       4.835   0.045 106.387   0.000   4.835  30.821
##      Benev_b         0.000
##      Unive_b         0.000
##      0.000   0.000
##
## Variances:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .iphlppl_r      0.009   0.006   1.471   0.141   0.009   0.132

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##      .iplylfr_r      0.017    0.007    2.510    0.012    0.017    0.443
##      .ipeqopt_r      0.021    0.008    2.629    0.009    0.021    0.366
##      .ipudrst_r      0.006    0.004    1.547    0.122    0.006    0.122
##      .impenv_r       0.019    0.008    2.482    0.013    0.019    0.777
##      Benev_b         0.058    0.025    2.259    0.024    1.000    1.000
##      Unive_b         0.037    0.020    1.792    0.073    1.000    1.000
##
## R-Square:
##      Estimate
##      iphlpppl_r      0.868
##      iplylfr_r       0.557
##      ipeqopt_r       0.634
##      ipudrst_r       0.878
##      impenv_r        0.223
##
## $FIT
##      npar      fmin      chisq      df
##      35.000      2.868      1512.979      35.000
##      pvalue      baseline.chisq      baseline.df      baseline.pvalue
##      0.000      61262.378      55.000      0.000
##      cfi      tli      logl      unrestricted.logl
##      0.976      0.962      -368574.145      -367817.656
##      aic      bic      ntotal      bic2
##      737218.291      737504.795      26525.000      737393.566
##      rmsea      rmsea.ci.lower      rmsea.ci.upper      rmsea.pvalue
##      0.040      0.038      0.042      1.000
##      srmr      srmr_within      srmr_between
##      0.070      0.020      0.049
##
## $PE
##      lhs op      rhs block level exo      est      se
## 1 Benev_w == iphlpppl_r      1      1      0      1.000000e+00      0.0000000000
## 2 Benev_w == iplylfr_r      1      1      0      8.728802e-01      0.0128087087
## 3 Unive_w == ipeqopt_r      1      1      0      1.000000e+00      0.0000000000
## 4 Unive_w == ipudrst_r      1      1      0      1.135990e+00      0.0197326675
## 5 Unive_w == impenv_r      1      1      0      1.054991e+00      0.0194496927
## 6 STRasc == Unive_w      1      1      0      1.000000e+00      0.0000000000
## 7 STRasc == Benev_w      1      1      0      9.483004e-01      0.0548515380
## 8 STRasc ~ agea      1      1      0      -1.688429e-04      0.0002297627
## 9 STRasc ~ gndrD      1      1      0      1.474030e-01      0.0082230513
## 10 STRasc ~ eiscd2      1      1      0      9.275608e-02      0.0099889290
## 11 STRasc ~ eiscd3      1      1      0      1.621477e-01      0.0129502598
## 12 STRasc ~ domicil2      1      1      0      2.228554e-02      0.0095449775
## 13 STRasc ~ domicil3      1      1      0      5.681961e-02      0.0136308751
## 14 STRasc ~ domicil4      1      1      0      4.905729e-02      0.0118984400
## 15 iphlpppl_r ~ iphlpppl_r      1      1      0      4.659934e-01      0.0065675769
## 16 iplylfr_r ~ iplylfr_r      1      1      0      4.237010e-01      0.0053920140
## 17 ipeqopt_r ~ ipeqopt_r      1      1      0      7.809868e-01      0.0080817143
## 18 ipudrst_r ~ ipudrst_r      1      1      0      6.586205e-01      0.0075845876
## 19 impenv_r ~ impenv_r      1      1      0      6.614307e-01      0.0071983154
## 20 Benev_w ~ Benev_w      1      1      0      1.106386e-01      0.0159966180
## 21 Unive_w ~ Unive_w      1      1      0      -4.534730e-02      0.0172698147
## 22 STRasc ~ STRasc      1      1      0      2.936276e-01      0.0180644241
## 23 agea ~ agea      1      1      1      3.476750e+02      0.0000000000

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## 24	agea	~~	gndrD	1	1	1	2.426912e-01	0.0000000000
## 25	agea	~~	eiscd2	1	1	1	-6.507168e-01	0.0000000000
## 26	agea	~~	eiscd3	1	1	1	-5.406374e-01	0.0000000000
## 27	agea	~~	domicil2	1	1	1	-4.031874e-02	0.0000000000
## 28	agea	~~	domicil3	1	1	1	7.142469e-02	0.0000000000
## 29	agea	~~	domicil4	1	1	1	-3.147939e-01	0.0000000000
## 30	gndrD	~~	gndrD	1	1	1	2.492865e-01	0.0000000000
## 31	gndrD	~~	eiscd2	1	1	1	2.435458e-03	0.0000000000
## 32	gndrD	~~	eiscd3	1	1	1	1.850434e-03	0.0000000000
## 33	gndrD	~~	domicil2	1	1	1	5.429576e-03	0.0000000000
## 34	gndrD	~~	domicil3	1	1	1	2.237286e-05	0.0000000000
## 35	gndrD	~~	domicil4	1	1	1	1.692725e-04	0.0000000000
## 36	eiscd2	~~	eiscd2	1	1	1	2.174369e-01	0.0000000000
## 37	eiscd2	~~	eiscd3	1	1	1	-7.776361e-02	0.0000000000
## 38	eiscd2	~~	domicil2	1	1	1	5.859252e-03	0.0000000000
## 39	eiscd2	~~	domicil3	1	1	1	-1.655407e-03	0.0000000000
## 40	eiscd2	~~	domicil4	1	1	1	3.408555e-03	0.0000000000
## 41	eiscd3	~~	eiscd3	1	1	1	1.841335e-01	0.0000000000
## 42	eiscd3	~~	domicil2	1	1	1	-2.470509e-03	0.0000000000
## 43	eiscd3	~~	domicil3	1	1	1	1.013673e-02	0.0000000000
## 44	eiscd3	~~	domicil4	1	1	1	1.310933e-02	0.0000000000
## 45	domicil2	~~	domicil2	1	1	1	2.156720e-01	0.0000000000
## 46	domicil2	~~	domicil3	1	1	1	-3.593941e-02	0.0000000000
## 47	domicil2	~~	domicil4	1	1	1	-5.486425e-02	0.0000000000
## 48	domicil3	~~	domicil3	1	1	1	1.011539e-01	0.0000000000
## 49	domicil3	~~	domicil4	1	1	1	-1.990702e-02	0.0000000000
## 50	domicil4	~~	domicil4	1	1	1	1.439365e-01	0.0000000000
## 51	iphlppl_r	~1		1	1	0	0.000000e+00	0.0000000000
## 52	iplylfr_r	~1		1	1	0	0.000000e+00	0.0000000000
## 53	ipeqopt_r	~1		1	1	0	0.000000e+00	0.0000000000
## 54	ipudrst_r	~1		1	1	0	0.000000e+00	0.0000000000
## 55	impenv_r	~1		1	1	0	0.000000e+00	0.0000000000
## 56	agea	~1		1	1	1	4.992818e+01	0.0000000000
## 57	gndrD	~1		1	1	1	5.267107e-01	0.0000000000
## 58	eiscd2	~1		1	1	1	3.195476e-01	0.0000000000
## 59	eiscd3	~1		1	1	1	2.433553e-01	0.0000000000
## 60	domicil2	~1		1	1	1	3.147220e-01	0.0000000000
## 61	domicil3	~1		1	1	1	1.141942e-01	0.0000000000
## 62	domicil4	~1		1	1	1	1.743261e-01	0.0000000000
## 63	Benev_w	~1		1	1	0	0.000000e+00	0.0000000000
## 64	Unive_w	~1		1	1	0	0.000000e+00	0.0000000000
## 65	STrasc	~1		1	1	0	0.000000e+00	0.0000000000
## 66	Benev_b	==	iphlppl_r	2	2	0	1.000000e+00	0.0000000000
## 67	Benev_b	==	iplylfr_r	2	2	0	6.132348e-01	0.1589647829
## 68	Unive_b	==	ipeqopt_r	2	2	0	1.000000e+00	0.0000000000
## 69	Unive_b	==	ipudrst_r	2	2	0	1.063793e+00	0.2434277706
## 70	Unive_b	==	impenv_r	2	2	0	3.878098e-01	0.2212691838
## 71	iphlppl_r	~~	iphlppl_r	2	2	0	8.752926e-03	0.0059510920
## 72	iplylfr_r	~~	iplylfr_r	2	2	0	1.720455e-02	0.0068533303
## 73	ipeqopt_r	~~	ipeqopt_r	2	2	0	2.108685e-02	0.0080222729
## 74	ipudrst_r	~~	ipudrst_r	2	2	0	5.753491e-03	0.0037181841
## 75	impenv_r	~~	impenv_r	2	2	0	1.911915e-02	0.0077018532
## 76	Benev_b	~~	Benev_b	2	2	0	5.753354e-02	0.0254693004
## 77	Unive_b	~~	Unive_b	2	2	0	3.651617e-02	0.0203765526

## 78	Benev_b	~~	Unive_b	2	2	0	4.920108e-02	0.0212503882	
## 79	iphlppl_r	~1		2	2	0	4.712970e+00	0.0702757480	
## 80	iplylfr_r	~1		2	2	0	4.979406e+00	0.0541520426	
## 81	ipeqopt_r	~1		2	2	0	4.679581e+00	0.0662584700	
## 82	ipudrst_r	~1		2	2	0	4.504111e+00	0.0609018581	
## 83	impenv_r	~1		2	2	0	4.835223e+00	0.0454492304	
## 84	Benev_b	~1		2	2	0	0.000000e+00	0.0000000000	
## 85	Unive_b	~1		2	2	0	0.000000e+00	0.0000000000	
## 86	iphlppl_r	r2	iphlppl_r	1	1	0	4.520903e-01		NA
## 87	iplylfr_r	r2	iplylfr_r	1	1	0	4.087829e-01		NA
## 88	ipeqopt_r	r2	ipeqopt_r	1	1	0	2.491777e-01		NA
## 89	ipudrst_r	r2	ipudrst_r	1	1	0	3.368007e-01		NA
## 90	impenv_r	r2	impenv_r	1	1	0	3.036904e-01		NA
## 91	Benev_w	r2	Benev_w	1	1	0	7.122529e-01		NA
## 92	Unive_w	r2	Unive_w	1	1	0		NA	NA
## 93	STrasc	r2	STrasc	1	1	0	3.581893e-02		NA
## 94	iphlppl_r	r2	iphlppl_r	2	2	0	8.679531e-01		NA
## 95	iplylfr_r	r2	iplylfr_r	2	2	0	5.570455e-01		NA
## 96	ipeqopt_r	r2	ipeqopt_r	2	2	0	6.339280e-01		NA
## 97	ipudrst_r	r2	ipudrst_r	2	2	0	8.777861e-01		NA
## 98	impenv_r	r2	impenv_r	2	2	0	2.231478e-01		NA
##		z	pvalue			std.lv	std.all		std.nox
## 1		NA	NA			6.200803e-01	0.6723765739		6.723766e-01
## 2		68.1474036	0.000000e+00			5.412558e-01	0.6393612927		6.393613e-01
## 3		NA	NA			5.091055e-01	0.4991769764		4.991770e-01
## 4		57.5689817	0.000000e+00			5.783385e-01	0.5803453640		5.803454e-01
## 5		54.2420397	0.000000e+00			5.371017e-01	0.5510811532		5.510812e-01
## 6		NA	NA			1.083955e+00	1.0839551792		1.083955e+00
## 7		17.2884925	0.000000e+00			8.439508e-01	0.8439507675		8.439508e-01
## 8		-0.7348574	4.624264e-01			-3.059592e-04	-0.0057049293		-3.059592e-04
## 9		17.9255852	0.000000e+00			2.671082e-01	0.1333633964		2.671082e-01
## 10		9.2858883	0.000000e+00			1.680828e-01	0.0783772324		1.680828e-01
## 11		12.5208058	0.000000e+00			2.938270e-01	0.1260834453		2.938270e-01
## 12		2.3347925	1.955426e-02			4.038351e-02	0.0187543071		4.038351e-02
## 13		4.1684488	3.066796e-05			1.029625e-01	0.0327469089		1.029625e-01
## 14		4.1230019	3.739666e-05			8.889646e-02	0.0337263967		8.889646e-02
## 15		70.9536232	0.000000e+00			4.659934e-01	0.5479097428		5.479097e-01
## 16		78.5793649	0.000000e+00			4.237010e-01	0.5912171374		5.912171e-01
## 17		96.6362740	0.000000e+00			7.809868e-01	0.7508223463		7.508223e-01
## 18		86.8366948	0.000000e+00			6.586205e-01	0.6631992585		6.631993e-01
## 19		91.8868699	0.000000e+00			6.614307e-01	0.6963095626		6.963096e-01
## 20		6.9163769	4.633405e-12			2.877471e-01	0.2877471020		2.877471e-01
## 21		-2.6258128	8.644234e-03			-1.749588e-01	-0.1749588306		-1.749588e-01
## 22		16.2544658	0.000000e+00			9.641811e-01	0.9641810674		9.641811e-01
## 23		NA	NA			3.476750e+02	1.0000000000		3.476750e+02
## 24		NA	NA			2.426912e-01	0.0260686109		2.426912e-01
## 25		NA	NA			-6.507168e-01	-0.0748408359		-6.507168e-01
## 26		NA	NA			-5.406374e-01	-0.0675698567		-5.406374e-01
## 27		NA	NA			-4.031874e-02	-0.0046561113		-4.031874e-02
## 28		NA	NA			7.142469e-02	0.0120439915		7.142469e-02
## 29		NA	NA			-3.147939e-01	-0.0444993986		-3.147939e-01
## 30		NA	NA			2.492865e-01	1.0000000000		2.492865e-01
## 31		NA	NA			2.435458e-03	0.0104607929		2.435458e-03
## 32		NA	NA			1.850434e-03	0.0086368958		1.850434e-03

## 33	NA	NA	5.429576e-03	0.0234163679	5.429576e-03
## 34	NA	NA	2.237286e-05	0.0001408902	2.237286e-05
## 35	NA	NA	1.692725e-04	0.0008936171	1.692725e-04
## 36	NA	NA	2.174369e-01	1.0000000000	2.174369e-01
## 37	NA	NA	-7.776361e-02	-0.3886362784	-7.776361e-02
## 38	NA	NA	5.859252e-03	0.0270569353	5.859252e-03
## 39	NA	NA	-1.655407e-03	-0.0111621259	-1.655407e-03
## 40	NA	NA	3.408555e-03	0.0192671785	3.408555e-03
## 41	NA	NA	1.841335e-01	1.0000000000	1.841335e-01
## 42	NA	NA	-2.470509e-03	-0.0123971859	-2.470509e-03
## 43	NA	NA	1.013673e-02	0.0742745760	1.013673e-02
## 44	NA	NA	1.310933e-02	0.0805246015	1.310933e-02
## 45	NA	NA	2.156720e-01	1.0000000000	2.156720e-01
## 46	NA	NA	-3.593941e-02	-0.2433227894	-3.593941e-02
## 47	NA	NA	-5.486425e-02	-0.3113917174	-5.486425e-02
## 48	NA	NA	1.011539e-01	1.0000000000	1.011539e-01
## 49	NA	NA	-1.990702e-02	-0.1649793583	-1.990702e-02
## 50	NA	NA	1.439365e-01	1.0000000000	1.439365e-01
## 51	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 52	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 53	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 54	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 55	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 56	NA	NA	4.992818e+01	2.6776822518	4.992818e+01
## 57	NA	NA	5.267107e-01	1.0549276711	5.267107e-01
## 58	NA	NA	3.195476e-01	0.6852813325	3.195476e-01
## 59	NA	NA	2.433553e-01	0.5671193128	2.433553e-01
## 60	NA	NA	3.147220e-01	0.6776885010	3.147220e-01
## 61	NA	NA	1.141942e-01	0.3590481306	1.141942e-01
## 62	NA	NA	1.743261e-01	0.4594909268	1.743261e-01
## 63	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 64	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 65	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 66	NA	NA	2.398615e-01	0.9316399836	9.316400e-01
## 67	3.8576773	1.144697e-04	1.470914e-01	0.7463548009	7.463548e-01
## 68	NA	NA	1.910920e-01	0.7961959461	7.961959e-01
## 69	4.3700559	1.242147e-05	2.032824e-01	0.9369023848	9.369024e-01
## 70	1.7526609	7.966023e-02	7.410737e-02	0.4723852453	4.723852e-01
## 71	1.4708100	1.413425e-01	8.752926e-03	0.1320469410	1.320469e-01
## 72	2.5103921	1.205972e-02	1.720455e-02	0.4429545112	4.429545e-01
## 73	2.6285386	8.575262e-03	2.108685e-02	0.3660720154	3.660720e-01
## 74	1.5473926	1.217686e-01	5.753491e-03	0.1222139213	1.222139e-01
## 75	2.4824091	1.304974e-02	1.911915e-02	0.7768521800	7.768522e-01
## 76	2.2589370	2.388731e-02	1.000000e+00	1.0000000000	1.000000e+00
## 77	1.7920680	7.312208e-02	1.000000e+00	1.0000000000	1.000000e+00
## 78	2.3153027	2.059637e-02	1.073424e+00	1.0734244673	1.073424e+00
## 79	67.0639630	0.000000e+00	4.712970e+00	18.3055273579	1.830553e+01
## 80	91.9523260	0.000000e+00	4.979406e+00	25.2659431764	2.526594e+01
## 81	70.6261546	0.000000e+00	4.679581e+00	19.4977426713	1.949774e+01
## 82	73.9568750	0.000000e+00	4.504111e+00	20.7588710361	2.075887e+01
## 83	106.3873405	0.000000e+00	4.835223e+00	30.8213305613	3.082133e+01
## 84	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 85	NA	NA	0.000000e+00	0.0000000000	0.000000e+00
## 86	NA	NA	NA	NA	NA


```
## 87      NA      NA      NA      NA      NA
## 88      NA      NA      NA      NA      NA
## 89      NA      NA      NA      NA      NA
## 90      NA      NA      NA      NA      NA
## 91      NA      NA      NA      NA      NA
## 92      NA      NA      NA      NA      NA
## 93      NA      NA      NA      NA      NA
## 94      NA      NA      NA      NA      NA
## 95      NA      NA      NA      NA      NA
## 96      NA      NA      NA      NA      NA
## 97      NA      NA      NA      NA      NA
## 98      NA      NA      NA      NA      NA
```

```
##
##   cfi rmsea srmr
## 0.976 0.040 0.070
```

```
## Warning in lav_start_check_cov(lavpartable = lavpartable, start = START): lavaan WARNING: starting v
##
##           variables involved are: Benev_b  Unive_b  [in block 2]
```

```
##           lhs op           rhs block group level      mi      epc sepc.lv
## 102 iplylfr_r ~~ impenv_r      1      1      1 289.777  0.084   0.084
## 88  Benev_w == impenv_r      1      1      1 153.144  1.128   0.700
## 103 ipeqopt_r ~~ ipudrst_r     1      1      1 127.115  0.071   0.071
## 95  STrasc == impenv_r      1      1      1 127.011 -1.447  -0.799
## 105 ipudrst_r ~~ impenv_r     1      1      1  95.937 -0.063  -0.063
## 93  STrasc == ipeqopt_r     1      1      1  94.876  1.155   0.637
## 100 iplylfr_r ~~ ipeqopt_r     1      1      1  71.956 -0.042  -0.042
## 101 iplylfr_r ~~ ipudrst_r     1      1      1  70.943 -0.044  -0.044
## 87  Benev_w == ipudrst_r     1      1      1  38.015 -0.584  -0.362
## 86  Benev_w == ipeqopt_r     1      1      1  36.632 -0.527  -0.327
##           sepc.all sepc.nox
## 102    0.159    0.159
## 88    0.718    0.718
## 103    0.099    0.099
## 95   -0.819   -0.819
## 105   -0.096   -0.096
## 93    0.625    0.625
## 100   -0.073   -0.073
## 101   -0.083   -0.083
## 87   -0.363   -0.363
## 86   -0.321   -0.321
```

Ordered variables

```
model3<-'
Benev == iphlpppl_r + iplylfr_r
Unive == ipeqopt_r + ipudrst_r + impenv_r
Benev == Unive
'

for (r in c(8,9)) {
  ds_filtrada <- ds_filtradaAll %>% filter(essround == r)
  survey.design <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada)

  lavaan.OrdFit3 <- cfa(model3, data=ds_filtrada,
                        ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"))
```

```

survey.Ordfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordfit3,survey.design=survey.design)
assign(paste0("survey.Ordfit3r",r),survey.fit3)

print(paste("ESS round: ", r))
print(fitMeasures(survey.Ordfit3, c("cfi", "rmsea", "srmr")))
print(modindices(survey.Ordfit3,sort=T)[1:10,])

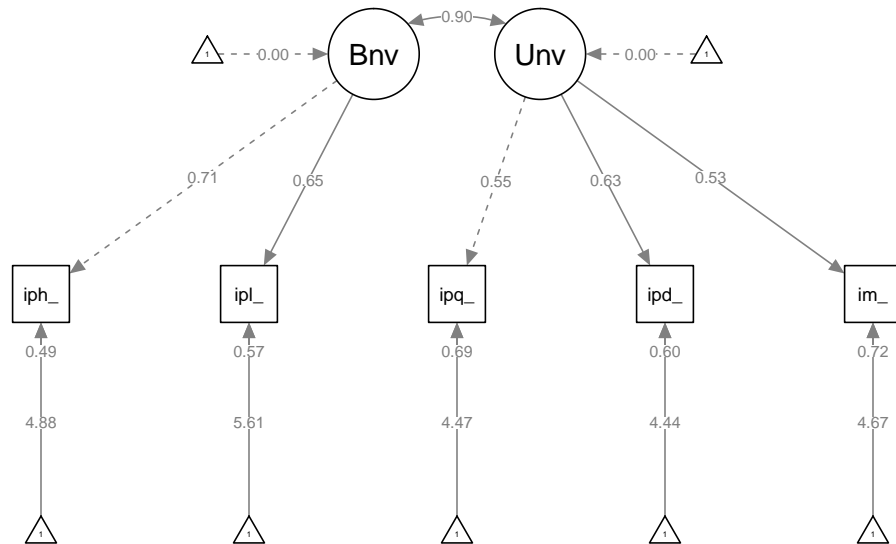
cov <- round(cov(ds_filtrada[,items], use="complete.obs"),3)
print(lowerMat(cov, digits=3))
print(round(colMeans(ds_filtrada[,items], na.rm = TRUE),3))
print(fitted(survey.Ordfit3))
invisible(semPaths(survey.Ordfit3,"model","stand", style = "lisrel", rainbowStart = 0.8))
}

```

```

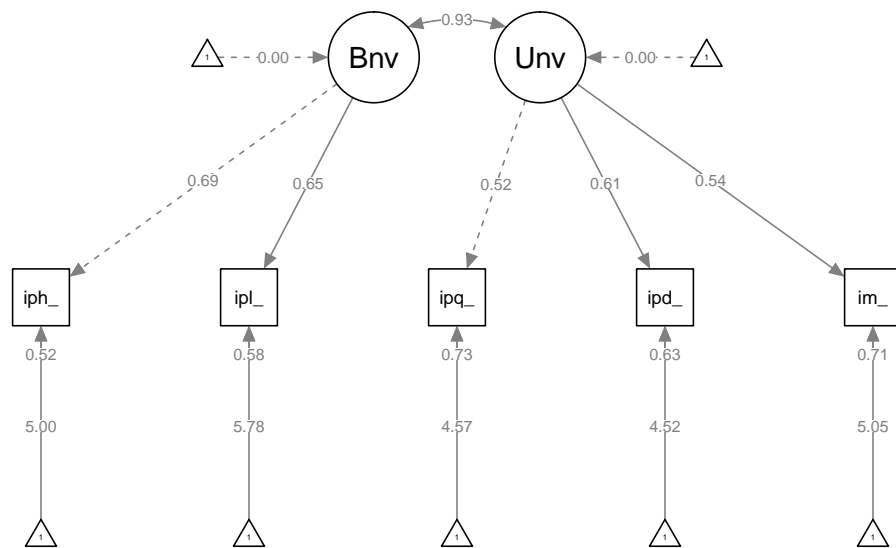
## [1] "ESS round: 8"
##   cfi rmsea srmr
## 0.990 0.047 0.014
##           lhs op           rhs           mi           epc sepc.lv sepc.all sepc.nox
## 32 iplylfr_r ~ impenv_r 166.589 0.065 0.065 0.109 0.109
## 21 Benev == ipeqopt_r 130.387 -0.830 -0.583 -0.543 -0.543
## 35 ipudrst_r ~ impenv_r 130.387 -0.075 -0.075 -0.106 -0.106
## 23 Benev == impenv_r 91.091 0.634 0.445 0.431 0.431
## 33 ipeqopt_r ~ ipudrst_r 91.091 0.068 0.068 0.094 0.094
## 30 iplylfr_r ~ ipeqopt_r 64.763 -0.043 -0.043 -0.070 -0.070
## 28 iphlppl_r ~ ipudrst_r 29.456 0.034 0.034 0.060 0.060
## 31 iplylfr_r ~ ipudrst_r 17.367 -0.023 -0.023 -0.041 -0.041
## 29 iphlppl_r ~ impenv_r 12.375 -0.020 -0.020 -0.033 -0.033
## 27 iphlppl_r ~ ipeqopt_r 5.289 -0.014 -0.014 -0.022 -0.022
##           iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.944
## iplylfr_r 0.401 0.791
## ipeqopt_r 0.354 0.276 1.124
## ipudrst_r 0.409 0.329 0.398 1.069
## impenv_r 0.332 0.318 0.321 0.318 1.052
## [1] 0.401 0.354 0.409 0.332 0.276 0.329 0.318 0.398 0.321 0.318
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
## 4.813 5.062 4.806 4.645 4.827
## $cov
##           iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.969
## iplylfr_r 0.413 0.814
## ipeqopt_r 0.375 0.314 1.154
## ipudrst_r 0.415 0.347 0.390 1.091
## impenv_r 0.345 0.289 0.324 0.358 1.069
##
## $mean
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
## 4.808 5.062 4.797 4.642 4.830

```



```
## [1] "ESS round: 9"
##   cfi rmsea srmr
## 0.985 0.058 0.017
##      lhs op      rhs      mi      epc sepc.lv sepc.all sepc.nox
## 32 iplylfr_r ~~ impenv_r 343.794 0.093 0.093 0.166 0.166
## 33 ipeqopt_r ~~ ipudrst_r 135.389 0.079 0.079 0.107 0.107
## 23 Benev == impenv_r 135.388 1.202 0.807 0.815 0.815
## 30 iplylfr_r ~~ ipeqopt_r 94.716 -0.051 -0.051 -0.085 -0.085
## 35 ipudrst_r ~~ impenv_r 86.516 -0.061 -0.061 -0.089 -0.089
## 21 Benev == ipeqopt_r 86.515 -0.983 -0.660 -0.625 -0.625
## 31 iplylfr_r ~~ ipudrst_r 72.357 -0.047 -0.047 -0.086 -0.086
## 29 iphlppl_r ~~ impenv_r 58.934 -0.043 -0.043 -0.074 -0.074
## 28 iphlppl_r ~~ ipudrst_r 40.168 0.040 0.040 0.069 0.069
## 22 Benev == ipudrst_r 5.674 -0.304 -0.204 -0.198 -0.198
##      iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.917
## iplylfr_r 0.373 0.763
## ipeqopt_r 0.337 0.257 1.100
## ipudrst_r 0.389 0.306 0.366 1.044
## impenv_r 0.315 0.321 0.280 0.305 0.974
## [1] 0.373 0.337 0.389 0.315 0.257 0.306 0.321 0.366 0.280 0.305
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
## 4.847 5.099 4.821 4.667 4.996
## $cov
##      iphlp_ iplyl_ ipqpt_ ipdrs_ impnv_
## iphlppl_r 0.938
```

```
## iplylfr_r 0.386 0.781
## ipeqopt_r 0.344 0.294 1.116
## ipudrst_r 0.392 0.335 0.347 1.065
## impenv_r 0.334 0.285 0.295 0.337 0.981
##
## $mean
## iphlppl_r iplylfr_r ipeqopt_r ipudrst_r impenv_r
## 4.848 5.105 4.826 4.666 5.007
```



```
countries <- c("Austria","Belgium","Czechia","Estonia","France","Germany",
               "Ireland","Italy","Netherlands","Slovenia","United Kingdom")

#,"Norway","Poland","Switzerland",
for (r in c(8,9)) {

  if (r == 9) countries <- c("Austria","Czechia","Estonia","France","Germany",
                             "Ireland","Italy","Netherlands","Slovenia","United Kingdom") #"Belgium",

  ds_filtrada <- ds_filtradaAll %>% filter(essround == r)
  survey.design <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada)

  # 1. CONFIGURAL EQUIVALENCE
  ## Add the "meanstructure" argument to add means/intercepts
  lavaan.Ordconffit3 <- cfa(model3, data=ds_filtrada,
                           meanstructure=TRUE, #the means of the observed variables enter the model,
                           ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r")
                           group.label = countries,
```

```

        group = "cntry",
        #group.equal = ...    #vector for multigroup analysis specify the pattern of
    )
survey.Ordconffit3 <- lavaan.survey(lavaan.fit=lavaan.Ordconffit3,survey.design=survey.design)
assign(paste0("survey.Ordconffit3r",r),survey.Ordconffit3)

# 2. METRIC EQUIVALENCE: set the factor loadings equal across groups

lavaan.Ordmetrfit3 <- cfa(model3, data=ds_filtrada,
    auto.fix.first=TRUE,    #factor loading of first indicator set to 1
    int.ov.free=TRUE,      #intercepts not fixed to 0
    meanstructure=TRUE,    #the means of the observed variables enter the model, n
    auto.var=TRUE,         #residual variances and variances of exogeneous latent v
    auto.cov.lv.x=TRUE,    #covariances of exogeneous latent variables are include
    ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
    group = "cntry",
    group.label = countries,
    group.equal=c("loadings") #vector for multigroup analysis specify the pattern
)
survey.Ordmetrfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordmetrfit3,survey.design=survey.design)

# 3. SCALAR EQUIVALENCE: set the factor loadings and the intercepts equal across groups

lavaan.Ordscalfit3 <- cfa(model3, data=ds_filtrada,
    auto.fix.first=TRUE,    #factor loading of first indicator set to 1
    int.ov.free=TRUE,      #intercepts not fixed to 0
    meanstructure=TRUE,    #the means of the observed variables enter the model, n
    auto.var=TRUE,         #residual variances and variances of exogeneous latent v
    auto.cov.lv.x=TRUE,    #covariances of exogeneous latent variables are include
    ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
    group = "cntry",
    group.label = countries,
    group.equal=c("loadings", "thresholds"))
survey.Ordscalfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordscalfit3,survey.design=survey.design)

# 4. check whether factor variances are equal across groups
lavaan.Ordvarianfit3 <- cfa(model3, data=ds_filtrada,
    auto.fix.first=TRUE,    #factor loading of first indicator set to 1
    int.ov.free=TRUE,      #intercepts not fixed to 0
    meanstructure=TRUE,    #the means of the observed variables enter the model, n
    auto.var=TRUE,         #residual variances and variances of exogeneous latent v
    auto.cov.lv.x=TRUE,    #covariances of exogeneous latent variables are include
    ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
    group = "cntry",
    group.label = countries,
    group.equal=c("loadings","intercepts","lv.variances"))
survey.Ordvarianfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordvarianfit3,survey.design=survey.design)

invar <- data.frame(round(rbind(Configural = fitMeasures(survey.Ordconffit3, c("cfi", "rmsea", "srmr"),
Metric = fitMeasures(survey.Ordmetrfit3, c("cfi", "rmsea", "srmr")),
Scalar = fitMeasures(survey.Ordscalfit3, c("cfi", "rmsea", "srmr")),

```

```

Strict = fitMeasures(survey.Ordvarianfit3, c("cfi", "rmsea", "srmr")),3))
difOrd <- invar %>%
  mutate_all(funs(. - lag(.)))
print(paste("ESS round: ", r))
print(cbind(invar,difOrd))
}

```

```

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 8;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 8;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_model_vcov(lavmodel = lavmodel2, lavsamplestats = lavsamplestats, : lavaan WARNING:
## The variance-covariance matrix of the estimated parameters (vcov)
## does not appear to be positive definite! The smallest eigenvalue
## (= 7.059793e-19) is close to zero. This may be a symptom that the
## model is not identified.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 1;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 5;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables

```

```

##           is not positive definite in group 3;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 8;
##           use lavInspect(fit, "cov.lv") to investigate.

## [1] "ESS round:  8"
##           cfi rmsea srmr      cfi  rmsea  srmr
## Configural 0.981 0.064 0.018      NA      NA      NA
## Metric     0.975 0.057 0.028 -0.006 -0.007 0.010
## Scalar     0.974 0.069 0.028 -0.001  0.012 0.000
## Strict     0.855 0.106 0.110 -0.119  0.037 0.082

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 1;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_model_vcov(lavmodel = lavmodel2, lavsamplestats = lavsamplestats, : lavaan WARNING:
## The variance-covariance matrix of the estimated parameters (vcov)
## does not appear to be positive definite! The smallest eigenvalue
## (= 1.447785e-18) is close to zero. This may be a symptom that the
## model is not identified.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 1;
##           use lavInspect(fit, "cov.lv") to investigate.

```

```
## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 1;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 4;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 6;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 1;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 2;
##           use lavInspect(fit, "cov.lv") to investigate.

## Warning in lav_object_post_check(object): lavaan WARNING: covariance matrix of latent variables
##           is not positive definite in group 7;
##           use lavInspect(fit, "cov.lv") to investigate.

## [1] "ESS round: 9"
##           cfi rmsea srmr      cfi rmsea srmr
## Configural 0.976 0.073 0.020      NA      NA      NA
## Metric      0.965 0.067 0.033 -0.011 -0.006 0.013
## Scalar      0.964 0.079 0.033 -0.001  0.012 0.000
## Strict      0.821 0.118 0.109 -0.143  0.039 0.076
```

SEM ordinal

```
semmodel <- '
Benev =~ iphlpppl_r + iplylfr_r
Unive =~ ipeqopt_r + ipudrst_r + impenv_r
STrasc =~ Unive + Benev
STrasc ~ agea + gndrD + eisced2 + eisced3 + domicil2 + domicil3 + domicil4
'

for (r in c(8,9)) {
  ds_filtrada2 <- ds_filtradaAll %>% filter(essround == r)
  survey.design2 <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada2)
```



```

lavaan.Ordsemfit <- cfa(semmodel, data=ds_filtrada2,
                        ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
                        cluster = "cntry")
survey.Ordsemfit <- lavaan.survey(lavaan.fit=lavaan.Ordsemfit,survey.design=survey.design2)
assign(paste0("survey.Ordsemfit",r),survey.Ordsemfit)

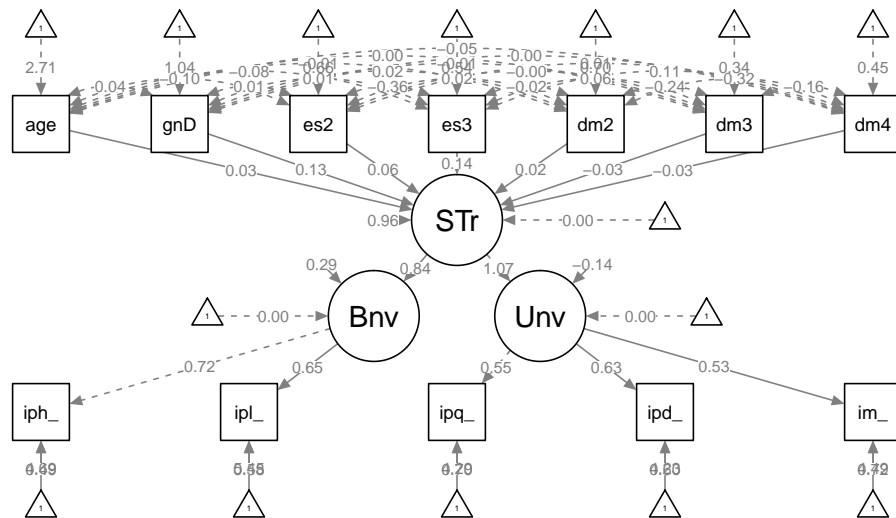
print(paste("ESS round: ", r))
print(fitMeasures(survey.Ordsemfit, c("cfi", "rmsea", "srmr")))
print(modindices(survey.Ordsemfit,sort=T)[1:10,])
invisible(semPaths(survey.Ordsemfit,"model","stand", style = "lisrel"))
}

```

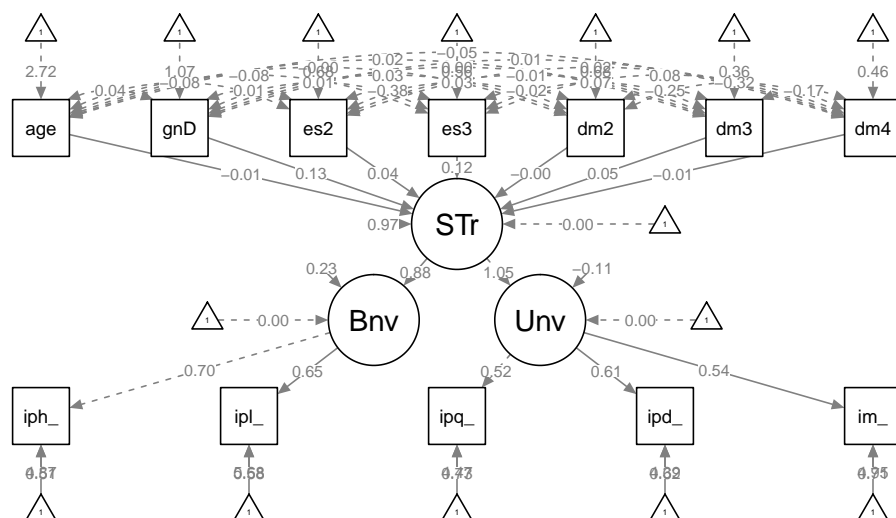
```

## [1] "ESS round: 8"
##   cfi rmsea srmr
## 0.934 0.046 0.021
##           lhs op           rhs           mi      epc sepc.lv sepc.all sepc.nox
## 82 iplylfr_r ~~   impenv_r 177.131  0.067  0.067  0.111  0.111
## 85 ipudrst_r ~~   impenv_r 142.662 -0.079 -0.079 -0.111 -0.111
## 73  STasc =~   ipeqopt_r 142.660  1.605  1.008  0.941  0.941
## 83 ipeqopt_r ~~   ipudrst_r 93.195  0.068  0.068  0.094  0.094
## 75  STasc =~   impenv_r 93.189 -1.189 -0.747 -0.723 -0.723
## 68  Benev =~   impenv_r 81.100  0.570  0.402  0.389  0.389
## 66  Benev =~   ipeqopt_r 73.928 -0.587 -0.415 -0.387 -0.387
## 70  Unive =~   iplylfr_r 48.066 -2.602 -1.532 -1.702 -1.702
## 69  Unive =~   iphlppl_r 48.063  3.144  1.852  1.882  1.882
## 80 iplylfr_r ~~   ipeqopt_r 45.105 -0.035 -0.035 -0.058 -0.058

```



```
## [1] "ESS round: 9"
##   cfi rmsea srmr
## 0.938 0.043 0.019
##      lhs op      rhs      mi      epc sepc.lv sepc.all sepc.nox
## 82 iplylfr_r ~~ impenv_r 360.764 0.094 0.094 0.168 0.168
## 68 Benev == impenv_r 156.189 1.120 0.756 0.765 0.765
## 75 STTrasc == impenv_r 121.568 -1.964 -1.134 -1.147 -1.147
## 83 ipeqopt_r ~~ ipudrst_r 121.568 0.075 0.075 0.102 0.102
## 85 ipudrst_r ~~ impenv_r 89.875 -0.062 -0.062 -0.091 -0.091
## 73 STTrasc == ipeqopt_r 89.870 1.742 1.006 0.956 0.956
## 81 iplylfr_r ~~ ipudrst_r 79.414 -0.049 -0.049 -0.090 -0.090
## 80 iplylfr_r ~~ ipeqopt_r 70.882 -0.044 -0.044 -0.073 -0.073
## 79 iphlppl_r ~~ impenv_r 51.277 -0.040 -0.040 -0.068 -0.068
## 66 Benev == ipeqopt_r 42.253 -0.605 -0.408 -0.388 -0.388
```



```
for (r in c(8,9)) {

  if (r == 9) countries <- c("Austria","Czechia","Estonia","France","Germany",
    "Ireland","Italy","Netherlands","Slovenia","United Kingdom") #"Belgium",

  ds_filtrada2 <- ds_filtradaAll %>% filter(essround == r)
  survey.design2 <- svydesign(ids=~idno, prob=~dweight, data=ds_filtrada2)

  # 1. CONFIGURAL EQUIVALENCE
  ## Add the "meanstructure" argument to add means/intercepts
  lavaan.Ordsemconffit3 <- cfa(semmodel, data=ds_filtrada2,
    auto.fix.first=TRUE, #factor loading of first indicator set to 1
    int.ov.free=TRUE, #intercepts not fixed to 0
    meanstructure=TRUE, #the means of the observed variables enter the model,
    auto.var=TRUE, #residual variances and variances of exogeneous laten
    auto.cov.lv.x=TRUE, #covariances of exogeneous latent variables are inclu
    ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r")
    group = "cntry",
    group.label = countries
    #group.equal = ... #vector for multigroup analysis specify the pattern o
  )
  survey.Ordsemconffit3 <- lavaan.survey(lavaan.fit=lavaan.Ordsemconffit3,survey.design=survey.design2)
  assign(paste0("survey.Ordsemconffit3r",r),survey.Ordsemconffit3)
  # 2. METRIC EQUIVALENCE: set the factor loadings equal across groups

  lavaan.Ordsemmetrfit3 <- cfa(semmodel, data=ds_filtrada2,
```

```

auto.fix.first=TRUE, #factor loading of first indicator set to 1
int.ov.free=TRUE, #intercepts not fixed to 0
meanstructure=TRUE, #the means of the observed variables enter the model, n
auto.var=TRUE, #residual variances and variances of exogenous latent
auto.cov.lv.x=TRUE, #covariances of exogenous latent variables are include
ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
group = "cntry",
group.label = countries,
group.equal=c("loadings") #vector for multigroup analysis specify the pattern
)
survey.Ordsemmetrfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordsemmetrfit3,survey.design=survey.design2)

# 3. SCALAR EQUIVALENCE: set the factor loadings and the intercepts equal across groups

lavaan.Ordsemscalfit3 <- cfa(semmodel, data=ds_filtrada2,
auto.fix.first=TRUE, #factor loading of first indicator set to 1
int.ov.free=TRUE, #intercepts not fixed to 0
meanstructure=TRUE, #the means of the observed variables enter the model, n
auto.var=TRUE, #residual variances and variances of exogenous latent
auto.cov.lv.x=TRUE, #covariances of exogenous latent variables are include
ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
group = "cntry",
group.label = countries,
group.equal=c("loadings","intercepts"))
survey.Ordsemscalfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordsemscalfit3,survey.design=survey.design2)

# 4. check whether factor variances are equal across groups
lavaan.Ordsemvarianfit3 <- cfa(semmodel, data=ds_filtrada2,
auto.fix.first=TRUE, #factor loading of first indicator set to 1
int.ov.free=TRUE, #intercepts not fixed to 0
meanstructure=TRUE, #the means of the observed variables enter the model, n
auto.var=TRUE, #residual variances and variances of exogenous latent
auto.cov.lv.x=TRUE, #covariances of exogenous latent variables are include
ordered = c("iphlppl_r", "iplylfr_r", "ipeqopt_r", "ipudrst_r", "impenv_r"),
group = "cntry",
group.label = countries,
group.equal=c("loadings","intercepts","lv.variances"))
survey.Ordsemvarianfit3 <- lavaan.survey(lavaan.fit=lavaan.Ordsemvarianfit3,survey.design=survey.design2)

Ordseminvar <- data.frame(round(rbind(Configural = fitMeasures(survey.Ordsemconffit3, c("cfi", "rmsea", "srmr"),
Metric = fitMeasures(survey.Ordsemmetrfit3, c("cfi", "rmsea", "srmr"),
Scalar = fitMeasures(survey.Ordsemscalfit3, c("cfi", "rmsea", "srmr"),
Strict = fitMeasures(survey.Ordsemvarianfit3, c("cfi", "rmsea", "srmr"),
Ordsemdif <- Ordseminvar %>%
mutate_all(funs(. - lag(.)))
print(paste("ESS round: ", r))
print(cbind(Ordseminvar,Ordsemdif))
}

```

```

## [1] "ESS round: 8"
##           cfi rmsea srmr      cfi  rmsea  srmr
## Configural 0.906 0.055 0.028      NA     NA     NA

```

```
## Metric      0.899 0.054 0.030 -0.007 -0.001 0.002
## Scalar      0.821 0.071 0.039 -0.078  0.017 0.009
## Strict      0.786 0.074 0.060 -0.035  0.003 0.021
## [1] "ESS round: 9"
##              cfi rmsea  srmr      cfi rmsea  srmr
## Configural  0.918 0.050 0.025      NA    NA    NA
## Metric      0.907 0.051 0.029 -0.011 0.001 0.004
## Scalar      0.807 0.071 0.040 -0.100 0.020 0.011
## Strict      0.761 0.077 0.063 -0.046 0.006 0.023
```

```
cntrylabels <- num_lab("

```

```
  1 Austria
  2 Belgium
  3 Czechia
  4 Estonia
  5 France
  6 Germany
  7 Ireland
  8 Italy
  9 Netherlands
 10  Norway
 11  Poland
 12  Slovenia
 13  Switzerland
 14  United Kingdom"
)
```

```
sum11 <-full_join(parameterEstimates(survey.Ordfit3r8),
  parameterEstimates(survey.Ordfit3r9),
  by=c("lhs", "op", "rhs"))
sum12 <-full_join(parameterEstimates(survey.Ordconffit3r8),
  parameterEstimates(survey.Ordconffit3r9),
  by=c("lhs", "op", "rhs", "block", "group"))
sum12$block <- as.character(sum12$block)
```

```
sum13 <-full_join(parameterEstimates(survey.Ordsemfit8),
  parameterEstimates(survey.Ordsemfit9),
  by=c("lhs", "op", "rhs"))
sum14 <-full_join(parameterEstimates(survey.Ordsemconffit3r8),
  parameterEstimates(survey.Ordsemconffit3r9),
  by=c("lhs", "op", "rhs", "block", "group"))
sum14 <- sum14 %>% mutate(est.x = ifelse(pvalue.x > 0.05, NA, round(est.x,3)),
  est.x = ifelse(rhs == "agea", est.x*10, est.x),
  est.y = ifelse(pvalue.y > 0.05, NA, round(est.y,3)),
  est.y = ifelse(rhs == "agea", est.y*10, est.y),
  rhs1 = ifelse(rhs == "gndrD", "Gender (Female / Male)",
    ifelse(rhs == "agea", "Age (10 years increment)",
      ifelse(rhs == "eiscd2", "Highest level of education, (Upper secondary)",
        ifelse(rhs == "eiscd3", "Highest level of education, (Tertiary)",
          ifelse(rhs == "domicil2", "Domicile (Town or village)",
            ifelse(rhs == "domicil3", "Domicile (City or town)",
              ifelse(rhs == "domicil4", "Domicile (Country)",
                NA))))))))))
val_lab(sum14$block) <- cntrylabels
sum14$block <- as.character(sum14$block)
```

```

dir <- "G:/My Drive/Master in Statistics/Structural equations/Paper/"
write.table(sum11,paste0(dir,"ParametersOrdffit.csv"), sep = ",", row.names = FALSE)
write.table(sum12,paste0(dir,"ParametersOrdConffit.csv"), sep = ",", row.names = FALSE)

write.table(sum13,paste0(dir,"ParametersOrdSemffit.csv"), sep = ",", row.names = FALSE)
write.table(sum14,paste0(dir,"ParametersOrdSemConffit.csv"), sep = ",", row.names = FALSE)

```

Results

```

coef<-rbind(cbind(ESS="ESS8",parameterEstimates(survey.semconffit3r8)),
            cbind(ESS="ESS9",parameterEstimates(survey.semconffit3r9)))

coeffilter <- coef %>%
  mutate(est = ifelse(pvalue > 0.05, NA, round(est,3)),
         est = ifelse(rhs == "agea", est*10, est),
         rhs1 = ifelse(rhs == "gndrD", "Gender (Female / Male)",
                       ifelse(rhs == "agea", "Age (10 years increment)",
                              ifelse(rhs == "eiscd2", "Highest level of education, (Upper secondary)",
                                     ifelse(rhs == "eiscd3", "Highest level of education, (Tertiary)",
                                            ifelse(rhs == "domicil2", "Domicile (Town or village)",
                                                  ifelse(rhs == "domicil3", "Domicile (Urban area)",
                                                        ifelse(rhs == "domicil4", "Domicile (Rural area)",
                                                                "Domicile (Other)"))))))),
         rhs1 = stringr::str_wrap(rhs1,30)) %>%
  filter(op == "~")

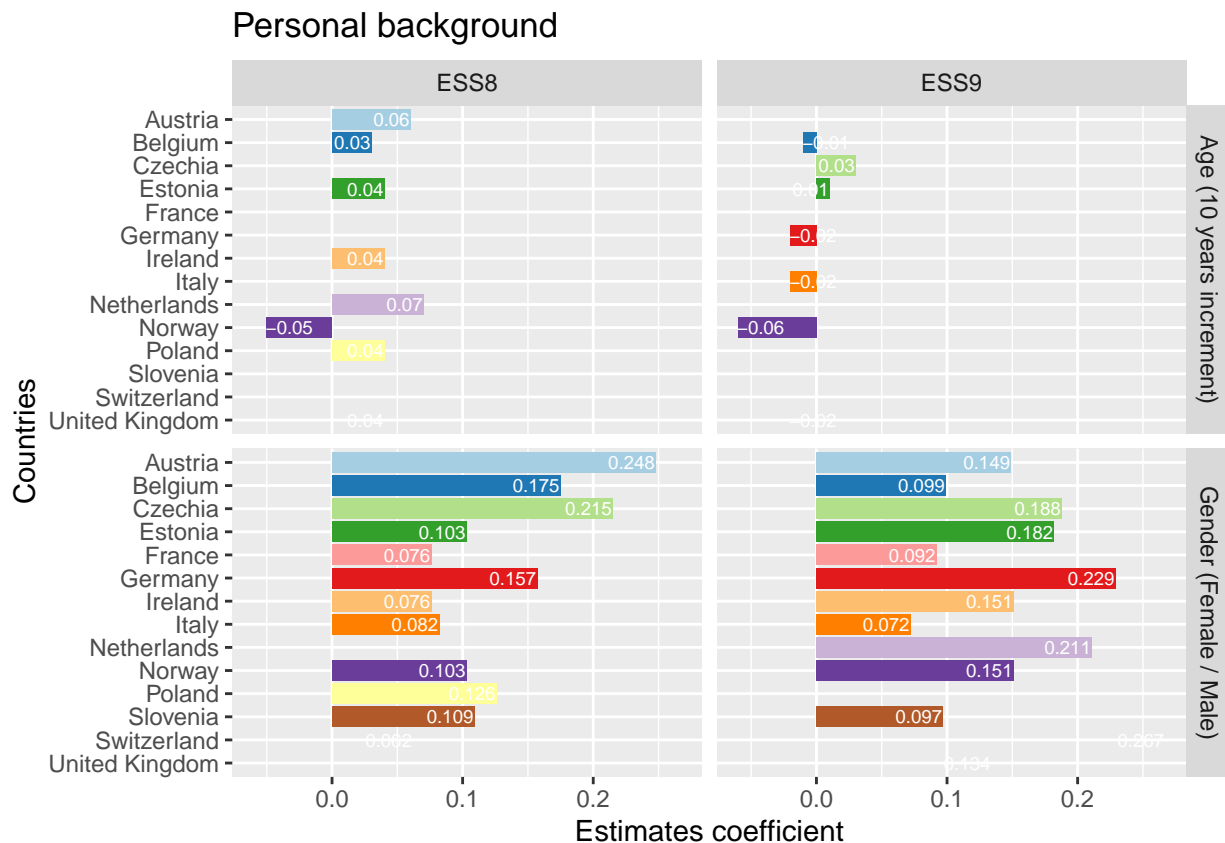
coeffilter1 <- coeffilter %>% filter(rhs %in% c("gndrD","agea"))
val_lab(coeffilter1$block) <- cntrylabels
use_labels(coeffilter1, {
  ggplot(coeffilter1,aes(x=factor(block), y=est, label = est, fill = factor(block))) +
  geom_bar(stat="identity", show.legend = FALSE) +
  coord_flip() +
  geom_text(hjust = ifelse(est >= 0, 1.02, 0.02), color = "white", size=2.5, ) +
  facet_grid(rhs1~ESS) +
  scale_x_discrete(limits = rev(levels(factor(block))))+
  xlab("Countries") + ylab("Estimates coefficient") +
  ggtitle("Personal background")+
  scale_fill_brewer(palette = "Paired")
})

```

```
## Warning: Removed 16 rows containing missing values (position_stack).
```

```
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Paired is 12
## Returning the palette you asked for with that many colors
```

```
## Warning: Removed 16 rows containing missing values (geom_text).
```



```

coefffilter2 <- coefffilter %>% filter(str_detect(rhs,"eiscsd"))
val_lab(coefffilter2$block) <- cntrylabels
use_labels(coefffilter2, {
  ggplot(coefffilter2,aes(x=factor(block), y=est, label = est, fill = factor(block))) +
  geom_bar(stat="identity", show.legend = FALSE) +
  coord_flip() +
  geom_text(hjust = ifelse(est >= 0, 1.02, 0.02), color = "white", size=2.5) +
  facet_grid(factor(rhs1)~ESS) +
  scale_x_discrete(limits = rev(levels(factor(block))))+
  xlab("Countries") + ylab("Estimates coefficient")+
  ggtitle("Educational background") +
  scale_fill_brewer(palette = "Paired")
})

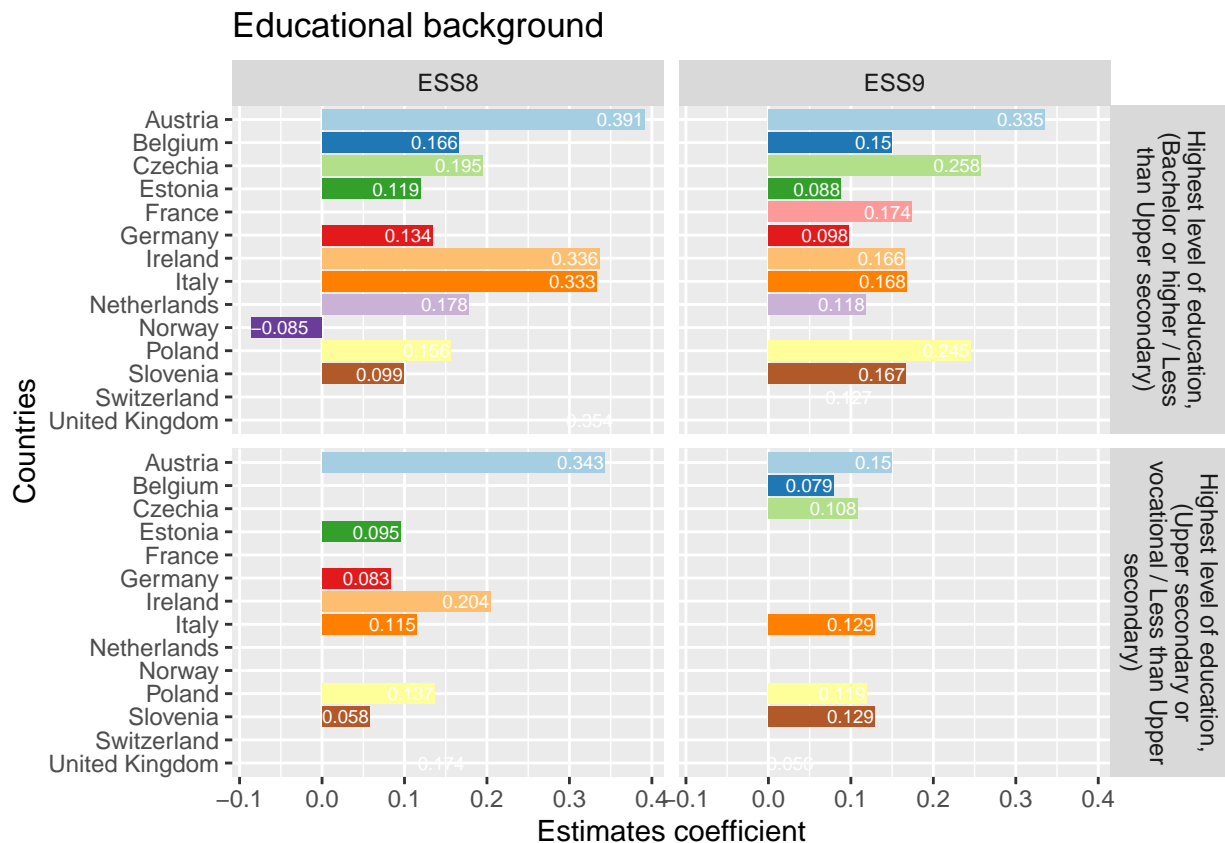
```

```
## Warning: Removed 17 rows containing missing values (position_stack).
```

```
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Paired is 12
```

```
## Returning the palette you asked for with that many colors
```

```
## Warning: Removed 17 rows containing missing values (geom_text).
```



```

coeffilter3 <- coeffilter %>% filter(str_detect(rhs,"domicil"))
val_lab(coeffilter3$block) <- cntrylabels
use_labels(coeffilter3, {
  ggplot(coeffilter3,aes(x=factor(block), y=est, label = est, fill = factor(block))) +
  geom_bar(stat="identity", show.legend = FALSE) +
  coord_flip() +
  geom_text(hjust = ifelse(est >= 0, 1.02, 0.02), color = "white", size=2.5) +
  facet_grid(factor(rhs1)~ESS, labeller = label_context) +
  scale_x_discrete(limits = rev(levels(factor(block))))+
  xlab("Countries") + ylab("Estimates coefficient") +
  ggtitle("Geographical background") +
  scale_fill_brewer(palette = "Paired")
})

```

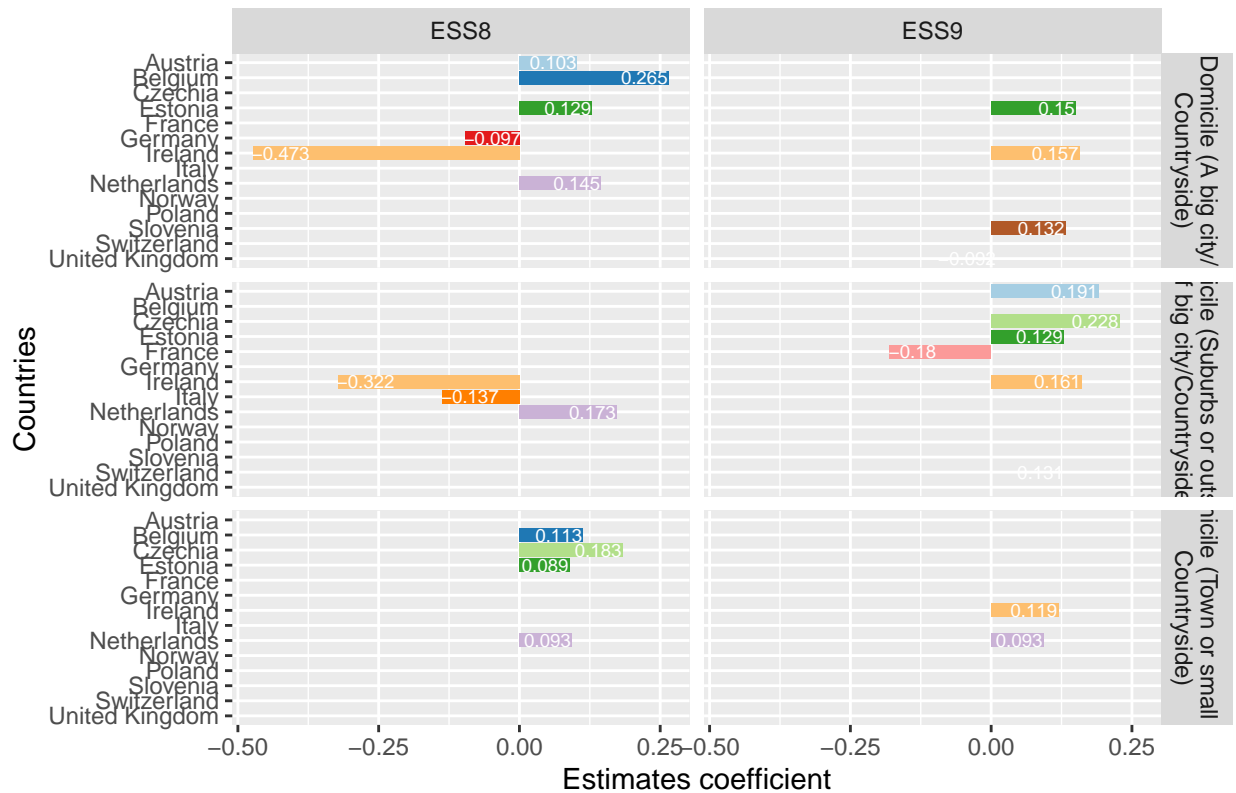
```
## Warning: Removed 59 rows containing missing values (position_stack).
```

```
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Paired is 12
```

```
## Returning the palette you asked for with that many colors
```

```
## Warning: Removed 59 rows containing missing values (geom_text).
```


Geographical background



```

Ordcoef<-rbind(cbind(ESS="ESS8",parameterEstimates(survey.Ordsemconffit3r8)),
               cbind(ESS="ESS9",parameterEstimates(survey.Ordsemconffit3r9)))

Ordcoeffilter <- Ordcoef %>%
  mutate(est = ifelse(pvalue > 0.05, NA, round(est,3)),
         est = ifelse(rhs == "agea", est*10, est),
         rhs1 = ifelse(rhs == "gndrD", "Gender (Female / Male)",
                       ifelse(rhs == "agea", "Age (10 years increment)",
                              ifelse(rhs == "eiscd2", "Highest level of education, (Upper secondary or below)",
                                     ifelse(rhs == "eiscd3", "Highest level of education, (Tertiary or above)",
                                            ifelse(rhs == "domicil2", "Domicile (Town or small city/Countryside)",
                                                  ifelse(rhs == "domicil3", "Domicile (Suburbs or outskirts of big city/Countryside)",
                                                        ifelse(rhs == "domicil4", "Domicile (A big city/Countryside)",
                                                                NA))))))))),
         rhs1 = stringr::str_wrap(rhs1,30)) %>%
  filter(op == "~")

Ordcoeffilter1 <- coeffilter %>% filter(rhs %in% c("gndrD","agea"))
val_lab(Ordcoeffilter1$block) <- cntrylabels
use_labels(Ordcoeffilter1, {
  ggplot(Ordcoeffilter1,aes(x=factor(block), y=est, label = est, fill = factor(block))) +
  geom_bar(stat="identity", show.legend = FALSE) +
  coord_flip() +
  geom_text(hjust = ifelse(est >= 0, 1.02, 0.02), color = "white", size=2.5, ) +
  facet_grid(rhs1~ESS) +
  scale_x_discrete(limits = rev(levels(factor(block))))+
  xlab("Countries") + ylab("Estimates coefficient") +

```

```

ggtitle("Personal background")+
scale_fill_brewer(palette = "Paired")

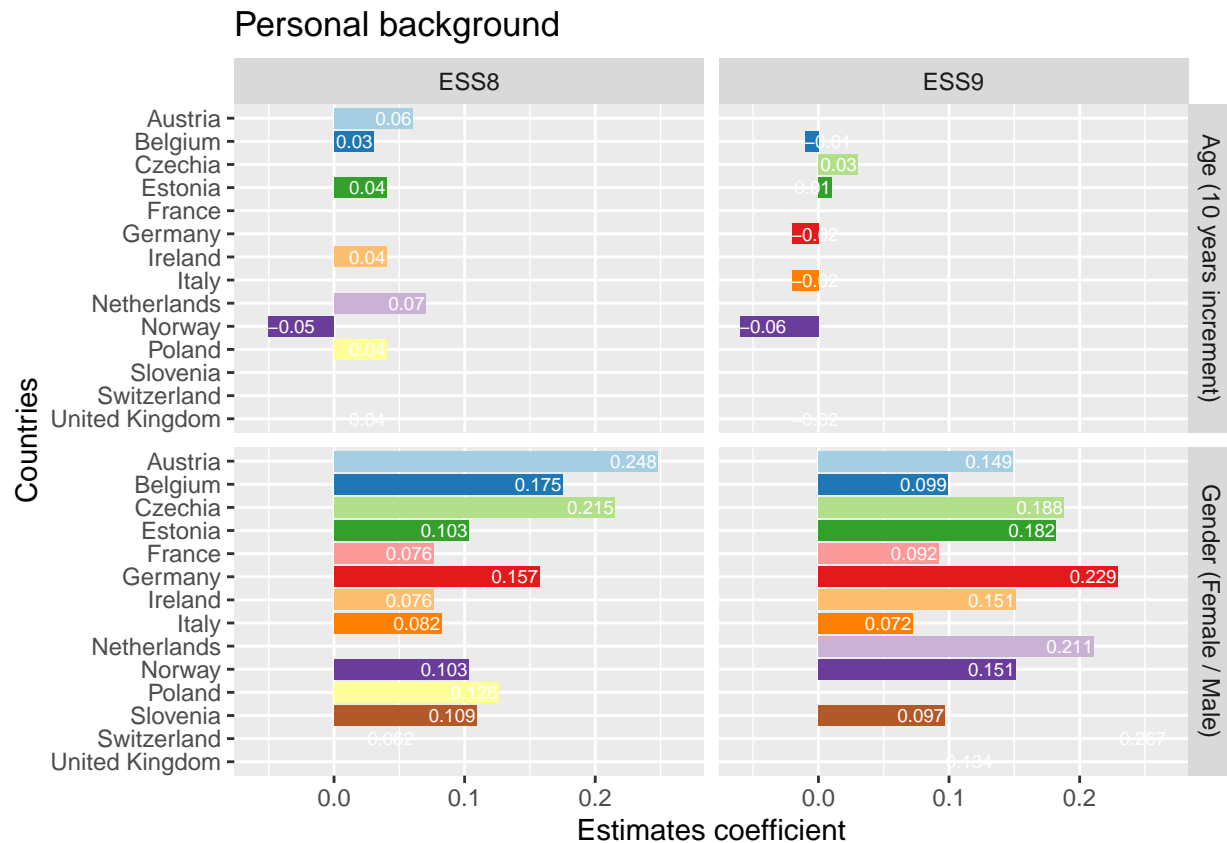
})

```

Warning: Removed 16 rows containing missing values (position_stack).

Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Paired is 12
Returning the palette you asked for with that many colors

Warning: Removed 16 rows containing missing values (geom_text).



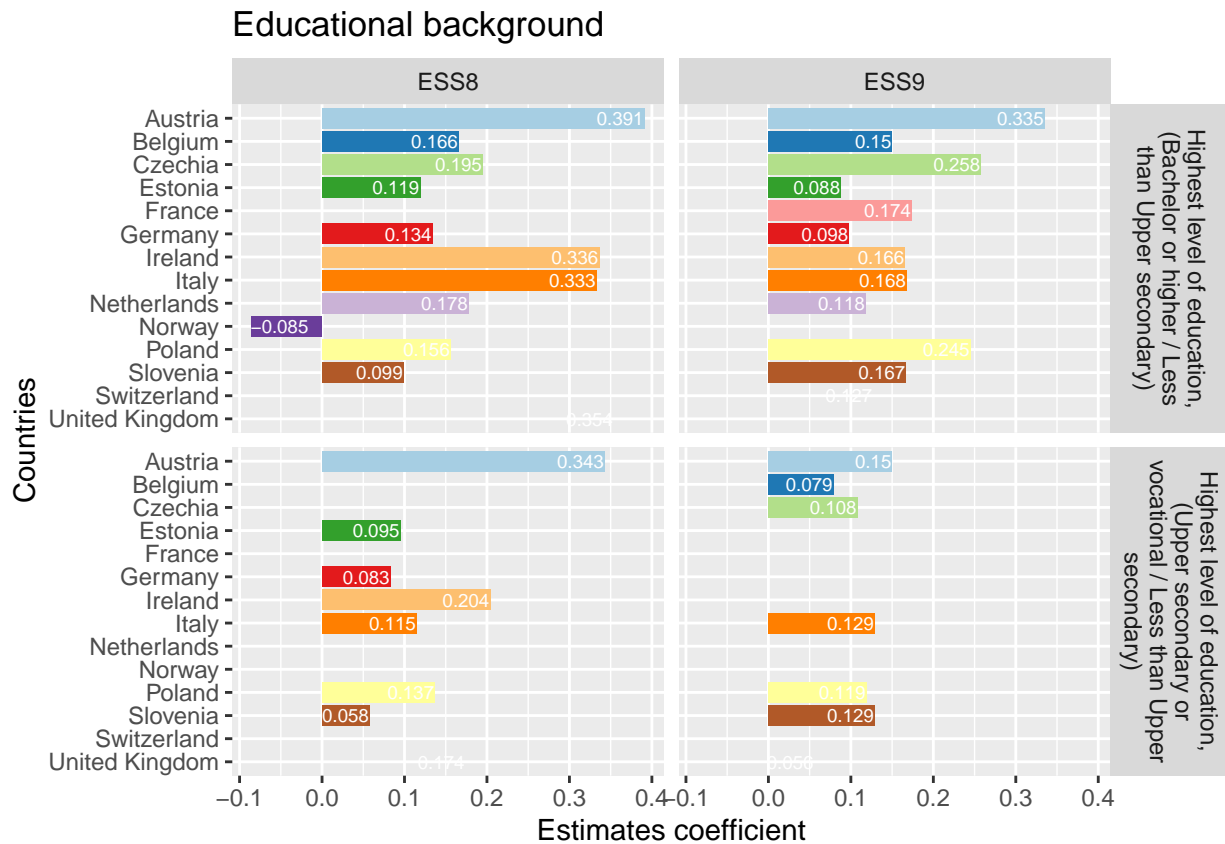
```

Ordcoeffilter2 <- coeffilter %>% filter(str_detect(rhs,"eisced"))
val_lab(Ordcoeffilter2$block) <- cntrylabels
use_labels(Ordcoeffilter2, {
  ggplot(Ordcoeffilter2,aes(x=factor(block), y=est, label = est, fill = factor(block))) +
  geom_bar(stat="identity", show.legend = FALSE) +
  coord_flip() +
  geom_text(hjust = ifelse(est >= 0, 1.02, 0.02), color ="white", size=2.5) +
  facet_grid(factor(rhs1)~ESS) +
  scale_x_discrete(limits = rev(levels(factor(block))))+
  xlab("Countries") + ylab("Estimates coefficient")+
  ggtitle("Educational background") +
  scale_fill_brewer(palette = "Paired")
})

```

Warning: Removed 17 rows containing missing values (position_stack).

```
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Paired is 12
## Returning the palette you asked for with that many colors
## Warning: Removed 17 rows containing missing values (geom_text).
```



```
Ordcoeffilter3 <- coeffilter %>% filter(str_detect(rhs,"domicil"))
val_lab(Ordcoeffilter3$block) <- cntrylabels
use_labels(Ordcoeffilter3, {
  ggplot(Ordcoeffilter3,aes(x=factor(block), y=est, label = est, fill = factor(block))) +
  geom_bar(stat="identity", show.legend = FALSE) +
  coord_flip() +
  geom_text(hjust = ifelse(est >= 0, 1.02, 0.02), color = "white", size=2.5) +
  facet_grid(factor(rhs1)~ESS, labeller = label_context) +
  scale_x_discrete(limits = rev(levels(factor(block))))+
  xlab("Countries") + ylab("Estimates coefficient") +
  ggtitle("Geographical background") +
  scale_fill_brewer(palette = "Paired")
})
```

```
## Warning: Removed 59 rows containing missing values (position_stack).
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Paired is 12
## Returning the palette you asked for with that many colors
## Warning: Removed 59 rows containing missing values (geom_text).
```

Geographical background

